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ANALYSIS OF THE CHARACTER AND MEASURES OF RELATIONS BETWEEN PERSONAL AND SUBSTANTIAL ELEMENTS IN THE PRODUCTION ENVIRONMENT

АНАЛИЗ ХАРАКТЕРА И МЕРЫ СВЯЗЕЙ МЕЖДУ ЛИЧНОСТНЫМИ И ВЕЩЕСТВЕННЫМИ ЭЛЕМЕНТАМИ В ПРОИЗВОДСТВЕННОЙ СРЕДЕ

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Abstract. The article discusses some of the issues of the effectiveness of the use of human resources based on the study of satisfaction with working conditions. A quantitative and qualitative assessment of the performance of labor and its dependence on the degree of satisfaction with the labor of workers is carried out on the basis of the method of correlation tables using the MS Excel spreadsheet processor as a toolkit.

Аннотация. В статье рассмотрены некоторые вопросы эффективности использования человеческих ресурсов на основе изучения удовлетворенности условиями труда. Количественная и качественная оценка результативности труда и зависимости его от степени удовлетворенности трудом работников проводится на основе методики корреляционных таблиц с использованием в качестве инструментария табличного процессора MS Excel.

The widespread development of a market economy requires constant improvement of the production process based, first of all, on the active introduction of new technologies and new economic relations into production, designed to achieve competitive advantages based on the results of labor activity. Such advantages can be achieved not only by improving the technological process, but also by introducing new forms and methods of labor organization, optimal use of human resources. Personal characteristics of employees, social and moral relations in the team, satisfaction of employees with working conditions affect labor productivity to no less extent than new machines, processes and mechanisms.

Modern studies of economists and production psychologists, carried out on the basis of experimental data, show that the following can be singled out as the main factors that form the estimated attitude of personnel to the work performed [1]:

− organizational, characterizing the state of labor organization, sanitary and hygienic conditions, wages and performance of norms and functions by employees;

− personal, reflecting the age, seniority and educational composition of employees, satisfaction with hours of work, their specialty, work performed;

− social and economic relationships, reflecting both the relationship in the team and the social development of the organization.

The purpose of this study is to analyze the data of a sociological survey and determine the nature and extent of the relationship between the personal characteristics of workers and indicators of labor and production efficiency.

The object of research is the production team of the open joint-stock company "Krasny Oktyabr". The proportion of respondents was about 15 % in relation to the total number of workers at the enterprise. The material for the study was the data obtained as a result of an anonymous correspondence survey of employees of the Vitebsk enterprise "Krasny Oktyabr". This type of survey provides the most complete and reliable information.

The primary sociological information that was collected during a survey of employees of the above-mentioned enterprise was processed in the MS Excel environment.

The results of the percentage distribution of answers to the questions of the questionnaire concerning the job satisfaction of workers of OJSC "Krasny Oktyabr" are shown in Figure 1.
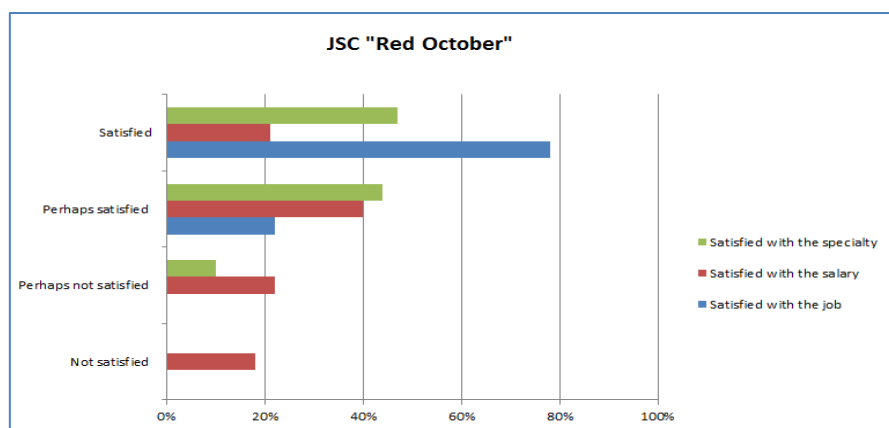

Figure 1 – Satisfaction with the work (received by the specialty, wages, work performed) of the personnel of OJSC "Krasny Oktyabr"

According to the results of the analysis, it can be noted that the level of satisfaction with the work of the enterprise personnel according to these indicators (Figure 1) is quite high. As you can see, the largest share of complete satisfaction (more than 75 %) is the specialty received and the work performed (more than 45 %). At the same time, the level of satisfaction with wages is quite low (from 20 % to 40 %).

To assess the randomness (or non-randomness) and the tightness of the relationship between qualitative characteristics, the methodology of V.V. Kovalev was used [2]. In accordance with this technique, if there are more than two qualitative features (that is, they are not alternative), then the presence of a connection between them is determined by the Pearson's mutual conjugacy coefficient C. The value of the Pearson's mutual conjugacy coefficient is within the same limits as the correlation coefficient. At the same time, conclusions about the dependence of qualitative characteristics, made only on the basis of the coefficient of mutual conjugation, should be supported by statistical criteria. For example, Pearson's $\chi2$ test. allows you to judge the randomness (non-randomness) of the distribution in the tables of mutual conjugation, and, consequently, the absence or presence of a relationship between the characteristics of the grouping. In accordance with the described methodology, the assessment of the tightness of the relationship between the level of education and the rate of output among workers and specialists of OJSC "Krasny Oktyabr" was carried out in several stages.

Stage 1. On the basis of tables with "closed" survey data, tables of mutual conjugation were compiled, in which the actual empirical values $f1$-$f9$ were calculated using the built-in functions of MS Excel.

Stage 2. The total values of the number of employees with different production rates (m1, m2, m3) and the number of employees with the corresponding educational level (n1, n2, n3) were calculated.

Stage 3. Based on the table of mutual contingency with empirical (actual) frequencies, the theoretical (expected) frequencies of distribution of answers to questions were calculated.

Stage 4. The coefficient of mutual conjugation C was calculated, which characterizes the tightness of the existing connection between the studied features.

Stage 5. The tabular values of the Pearson criterion $\chi2$ were calculated for the significance level p = 0.05 and six degrees of freedom (4-1) * (3-1) = 6, corresponding to the contingency table, and the significance value of the Pearson criterion $\chi2$.

The results of the analysis of the dependence of the fulfillment of production standards on the level of education of the personnel of OJSC "Krasny Oktyabr" are presented in Table 1.

Table 1 – The results of the analysis of the dependence of the fulfillment of production standards on the level of personnel education

Secondary education,%	Higher education, %	Pearson Mutual Contingency Coefficient (C)	Pearson criterion ($\chi2$)	Significance ($\chi2$)
43.33	56.67	**0.685**	26.49 > 12.59	0.00018<0.05

* compiled by authors

The value of the coefficient of mutual conjugation C = 0.685 allows us to conclude that for the considered enterprise, the relationship between the fulfillment of the

production rate by workers and the level of education is statistically significant and significant.

According to the results of the analysis, it can be noted that a tendency towards an increase in the dependence of labor productivity on the level of education is clearly manifested. However, among personnel with incomplete higher and higher education, the degree of dissatisfaction with the chosen profession is growing, which may affect this trend. This situation can be explained by the low profitability of the enterprise and the low level of sales of manufactured products at the present time [3].

The proposed approach to the analysis of the performance of workers makes it possible to study and assess the level of labor organization at enterprises of various forms of ownership and, as a consequence, to develop recommendations for drawing up a plan of measures aimed at improving the conditions for organizing labor and production and encouraging personnel to increase the level of education.

References

1. Чуднова, О. В. Алгоритм базового анализа данных социологического опроса в программе MS Excel // Современные научные исследования и инновации. 2015. № 4. Ч. 5 [Электронный ресурс]. URL: http://web.snauka.ru/issues/2015/04/45596 (дата обращения: 15.03.2021).
2. Статистика с элементами эконометрики : учебник для среднего профессионального образования. В 2 ч. Часть 1 / В. В. Ковалев [и др.]; под редакцией В. В. Ковалева. – Москва : Издательство Юрайт, 2017. – 333 с.
3. Сысоев, И. П. Модель развития и реализации резервов управленческой компоненты потенциала организации / И. П. Сысоев, В. А. Скворцов, Е. Ю. Вардомацкая // Вестник Полоцкого государственного университета, серия D. Экономические и юридические науки. – 2021. – № 6. – С. 82–86.

FINANCIAL RATIO ANALYSIS AS A SOURCE OF INFORMATION FOR USERS CONCERNED

ФИНАНСОВЫЙ КОЭФФИЦИЕНТНЫЙ АНАЛИЗ КАК ИСТОЧНИК ИНФОРМАЦИИ ДЛЯ ЗАИНТЕРЕСОВАННЫХ ПОЛЬЗОВАТЕЛЕЙ

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