

The relationship between working conditions and job satisfaction of coal miners: Typically analyzing of 86 Company Ltd., Dong Bac Corporation, Vietnam

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Abstract - Satisfaction of workers contribute significantly to the development of organisations, improving productivity and loyalty. One of the most important factors that create job satisfaction of workers is working conditions. Previous studies on working condition of mining workers in Vietnam have been approached from technical and technological perspectives but not from socio-economic perspectives as well as in the relation to labors' need. The paper aims to clarify the relationship between working conditions and job satisfaction of coal miners in 86 Company Ltd., Dong Bac Corporation. A survey of 150 workers and interviews with 15 managers in 86 Company Ltd., Dong Bac Corporation showed that working conditions positively impacted job satisfaction of workers.

The analysis results help 86 Company Ltd. as well as all coal mining companies in Dong Bac Corporation to satisfy their workers at work, improve the human resource management, increase the loyalty and labor productivity and business efficiency.

Index Terms - working conditions, job satisfaction, coal mining companies.

Introduction

Job satisfaction expresses a sense of pleasure and comfort as positive response to working aspects of the employees. According to Weiss (1967): Job satisfaction is the attitude of work expressed by the employee's feelings, beliefs and behaviors. Kreitner and Kinicki (2007) argued that components such as the essence of work, opportunities for training and advancement, leadership, co-workers, salary, job placement, compensation and rewards will bring job satisfaction to employees. Studies have also shown that job satisfaction can improve working performance (Saari and Judge, 2004) or employee's loyalty (Luddy, 2005; Tietjen and Myers, 1998). Therefore, researching and proposing solutions that bring job satisfaction to the employees will increase the productivity, business efficiency and development of companies.

There have been many studies on job satisfaction in the world and Vietnam. Authors have pointed out that job satisfaction is a function with variables, including: Job nature, Salary, Promotion opportunities, Personal development, Recognition, Working environment and Safety, etc.

Working conditions is one of the most important factors that directly affect the emotional and psychological well-being of employees and then, their satisfaction. Working conditions of workers at coal mining enterprises include technical, working organization of labors, economic, social, natural, environmental and cultural factors of the workplaces. If working conditions are improved by the manager, they are supposed to be better, it will bring more satisfaction to the employees, thus increases productivity. and reduce the phenomenon of quitting workers.

Based on the previous research models, the paper presents the basic hypotheses and examines these hypotheses by survey data to clarify the relationship between job satisfaction and working conditions in 86 Company Ltd. With the research results, the article also proposed some solutions to improve the working conditions which brings more satisfaction to the workers at the company.

Theoretical Structure, Modeling And Research Methodology

2.1. Job satisfaction

Job satisfaction reflects the meet of individual's needs and desires, and the perceptions of the employees about their work. According to demand theory of Maslow's (1943), the level of job satisfaction will increase as demand is met from the lowest level to the highest one. Similar to Maslow's point of view, Wright and Kim (2004) argued that job satisfaction reflects and depends on the suitability between employee's desirability of the work and their perception about that work. In the research on the nature of satisfaction, Levy-Garboua and Montmarquette (2004) argued that job satisfaction is the psychological state of an employee on the current work in comparison with his external opportunities. Thus, job satisfaction is

the state of positive feelings and thoughts of employees about their work and workplaces. The more satisfied the employees are, the better they love the job, the happier they are with the work and the more they want to contribute to the company.

2.2. Working conditions

Working conditions are a combination of technical, organizational, labor, economic, social, natural, environmental and cultural factors of any workplace (Tran Van Dai, 2017). Working conditions are expressed through technological process, working tools, working objects, laborers' capacity and the interaction between these factors in the labor process. Working conditions in enterprises in general and coal mining enterprises in particular have a great influence on the level of job satisfaction, productivity and efficiency of enterprises.

Examinations and solutions for improving the job conditions to achieve the productivity and efficient workforce have been done by many countries in the world. Since the 1930s, the International Labor Organization (ILO) has introduced the laborers' rights and principles in basic labor conventions to continuously improve the working conditions. Furthermore, labor articles are also referred to as an indispensable part of trade agreements. According to Marva Corley (2016), up to December 2015, there are 76 trade agreements (covering 135 economies) include labor articles.

According to Tran Van Dai (2017), factors constituting working conditions are: (1) technology, organization of labor; (2) economic and social condition; (3) psychology; and (4) working environment, etc. These factors affect not only the sense of work, but also the health, safety and working capacity of the employees.

According to Intertek, evaluating working conditions will help companies build an effective working mechanism, continuously improving working conditions through the oriented training programs and measures to solve the exist problems. Based on the ILO's conventions, Intertek has developed a programme of Workplace Conditions Assessment (WCA), which consists of five main parts: (1) labor (2) wages and hours of work; (3) health and safety; (4) management system; and (5) Working environment.

Thus, by the essence, working conditions include the technical, economic, social and organizational aspects. These aspects affect the job satisfaction through the follows: (1) job placement; (2) psychophysiology; (3) environmental and occupational safety; (4) economy (salary); and (5) Social relationship (co-worker relationship and superior – subordinate relationship). Working conditions are often expressed through employment contracts and working regulations of the companies.

2.3. Research models

From the above explanation, a research model of the relation between working conditions and job satisfaction is formed, in which the dependent variable is the job satisfaction, and the independent variables are the elements of the working conditions. There are five independent variables that influence the job satisfaction, including: (1) disposition of work; (2) psychophysiology; (3) environment and occupational safety; (4) salaries and bonuses, and (5) social relationship. Independent variables change, causing changes in labor force of companies, such as creativity, health conditions, senses of well-being, and dedication to work. Consequently, job satisfaction will change. The research model is shown in Figure 1.

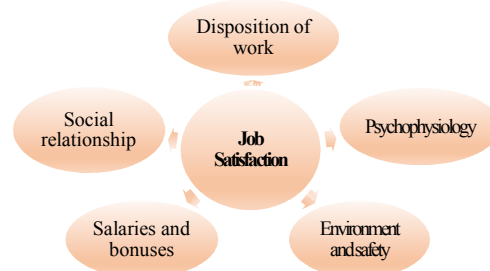


Fig 1. The research model of job satisfaction

The hypothesis for the research model comes from evaluation of the factors affecting job satisfaction at 86 Company Ltd., Dong Bac Corporation. Thus, there are 5 assumptions for the model of Fig. 1, such as:

DW: The coherence of disposition of work is co-variable with the level of job satisfaction;

PS: The positive state of psycho-physical is co-variable with the level of job satisfaction;

SE: The level of safety and working environment is co-variable with the level of job satisfaction;

SB: Salaries and bonuses is co-variable with the level of job satisfaction;

SR: Co-worker relationship and superior – subordinate relationship is co-variable with the level of job satisfaction.

2.4. Research Methods

Qualitative research methods and quantitative research methods are combined for conducting the study. Qualitative research methods were used for preliminary research through interviews 10 of staff, senior and middle managers of the 86 Company Ltd. Interviewers will answer questions in the pre-designed questionnaire. The preliminary research results are used to complete the research questionnaire and the model. Quantitative research methods are conducted to collect the assessment of Company's employees on satisfaction with the current working conditions. The size of the sample is 150, selected on the principle of simple random sampling, including direct employees and indirect ones of the Company.

2.5. Scale design

The scale is based on the development the theoretical of working conditions of Tran Van Dai (2017), on inheriting some variables as in the assessment on workplace conditions of Intertek's and on interviews of employees of the Company. The

study identified five independent variables and 26 observed variables to assess job satisfaction with working conditions at 86 Company Ltd. The data is processed by SPSS software. Several measures are used to analyze the data, such as: (1) set up a frequency table to clean the data of the sample under criteria of working position, gender, age, seniority; (2) Cronbach's alpha Coefficient: This measure is used to exclude unsuitable variables, to limit the variability of the rubbish variables (items with total correlation coefficient whose magnitude are less than 0.3 will be excluded) and evaluate the reliability of the scale. A set of questionnaires is acceptable when the Cronbach's alpha coefficient is 0.6 or above; (3) Exploratory Factor Analysis (EFA): the remaining variables after EFA will be taken on exploratory factor analysis for the purpose of shrinking and summarizing data. In the exploratory factor analysis, value of KMO (Kaiser-Meyer-Olkin) is the index used to determine the suitability of factor analysis. The analysis is relevant with the data if value of KMO is from 0.5 to 1 and it is not relevant with the data if the value is less than 0.5; (4) regression analysis: Variables for regression analysis is determined after Exploratory Factor Analysis. Multivariate regression analysis is used to estimate the influence of working condition factors (independent variables) on job satisfaction (dependent variables).

The form of regression function:

$$JS = \beta_0 + \beta_1SR + \beta_2SB + \beta_3DW + \beta_4SE + \beta_5PS \quad (2.1)$$

In which:

+ Dependent variable: JS (level of Job Satisfaction)

+ Independent variables: SR: Social relationship; SB: Salaries and bonuses; DW: Disposition of work; SE: Safety and Working environment; and PS: Psychophysiology.

Independent variables and dependent variables are all measured by observable variables. These observations were measured by using a 5-level Likert scale;

Results And Discussion

3.1 Basic information

Table 1. General information of sample

No	Criteria	Classification	Quantity (person)	Rate, %
	Gender	Male	17	
		Female	42	
	Age	<25	22	
		26-30	44	
		31-35	49	
		36-40	18	
		>40	17	
	Seniority	<5	53	
		6-10	64	
		11-15	26	
		16-20	5	
		>20	2	1.3
	Qualification	Post graduates	4	2.7
		Engineer	29	19.3
		Technical workers	34	22.7
		Technical colleges	83	55.3
Total			150	100

Source: Survey data

According to the surveyed data from 150 staff members of 86 Company Ltd., the average age is 31.5 and the average working years is 8.3, technical college education, 42%, 55.3% of the labor force were interviewed. Surveyed labors are mostly people who have worked in the company for a long time, many of them have been working in different positions, so their perception of job conditions and the level of job satisfaction is relatively clear.

3.2. Factor analysis

Table 2 describes the results of factors analysis, in which 20 weighted variables with KMO greater than 0.5 are aggregated into five new factors.

Table 2. Factor analysis results

No	Observable variables	Factor	Group
1	Work efficiency comes from colleagues help	0.82	1
2	Colleagues are trust	0.795	
3	Colleagues are friendly	0.793	
4	Colleagues are often willing to help each other	0.754	
5	Can live with current salary	0.772	2
6	Bonus is based on working performance	0.694	
7	The salary is consistent with ability and contribution	0.65	
8	Equity in salary, bonus distribution	0.634	
9	The salary level is equal to that of other companies	0.623	
10	Motivation for creativity atwork	0.665	3
11	Get full professional training	0.567	
12	Suitability of work with competence and expertise	0.547	
13	The workload is reasonable	0.546	
14	Equipments are advanced type	0.693	4
15	Ensurement of good conditions of labor safety and protection	0.571	
16	Be trained on safety	0.539	
17	The workplace is hygienic, airy, spacious	0.544	
18	Be advised by a superior when there is a problem related to work	0.543	5
19	The boss is always interested in subordinates	0.671	
20	Do not be over-pressured	0.523	

Source: Survey data

The results of the Exploratory Factor Analysis showed that value of KMO is 0.850 (> 0.5). It means that the analysis was significant. The total variance was 76.4% (> 50%); these five factors are able to interpret 76.4% for the 26 observed baseline variables. The results of the five new factors are shown in Table 3.

Table 3. Independent variables by new factors groups

Sign	Independent variables	Observed variables
SR1	Social relationship	Colleagues help workefficiency
SR2		Trusted Colleagues
SR3		Friendly colleague

SR4		Colleagues are often willing to help each other
SB1	Salaries and bonuses	Can live with the salary
SB2		Bonuses is based on working performance
SB3		Salary is consistent with ability and contribution
SB4		Equity in salary, bonus distribution
SB5		The salary level is equal to that of other companies
DW1	Disposition of work	Motivation for creativity in work
DW2		Get full professional training
DW3		Suitability of work with competence and expertise
DW4		The workload is reasonable
SE1	Safety and Working environment	Equipments are advanced type
SE2		Ensurement of good conditions of labor safety and protection
SE3		Be trained on safety
SE4		The workplace is hygienic, airy, spacious
PS1	Psychophysiol ogy	Be advised by a superior when there is a problem related to work
PS2		The boss is always interested in subordinates
PS3		Do not be over-pressured

Source: Survey data

3.3. Regression analysis

Regression analysis is used to estimate the influence of the working condition factors (independent variables) on job satisfaction (dependent variable).

$$\text{The form of regression model: } JS_i = \beta_0 + \beta_1 SR_i + \beta_2 SB_i + \beta_3 DW_i + \beta_4 SE_i + \beta_5 PS_i + U_i$$

In which:

Dependent variable: JS – Job satisfaction;

Independent variables DW: Disposition of work; PS: Psychophysiology; SE: Safety and Working environment; SB: Salaries and bonuses; SR: Social relationship.

U_i : Random Error

From the data, the multivariate linear regression equation was determined as follows:

$$JS_i = 2,117 + 0,105SR_i - 0.083SB_i + 0,047DW_i + 0,544SE_i + 0,045PS_i$$

The general correlation coefficients $R = 73.7\%$ and all five factors explained 54.4% ($R^2 = 0.544$) job satisfaction.

From the regression function, the satisfaction of the employees is positively correlated with the variables of social relationship, disposition of work, environment and labor safety, and physiological psychology. Each variable has different impact on job satisfaction in the company, in which the safety and working environment have the greatest impact. In case the company implement solutions that employees' evaluation on safety and working environment increases 1 point, the level of satisfaction of employees on working conditions will increase to 0.544 points, which is much higher than other variables. It is perfectly suited to the characteristics of heavy working conditions of coal mining enterprises in general and of 86 Company Ltd., in particular. The small relatively coefficient of salary and bonus shows that salary has a negligible impact on the level of job satisfaction of employees at the company. In other words, it is not effective to use only remuneration solutions to increase the level of satisfaction of the employees.

Solutions And Suggestions

In order to have the foundation for proposing solutions for human resource management of the company, it is necessary to analyze the mean values of independent variables and the composition of independent variables. Figure 2 depicts the level of employee satisfaction and the average value of the independent variables.

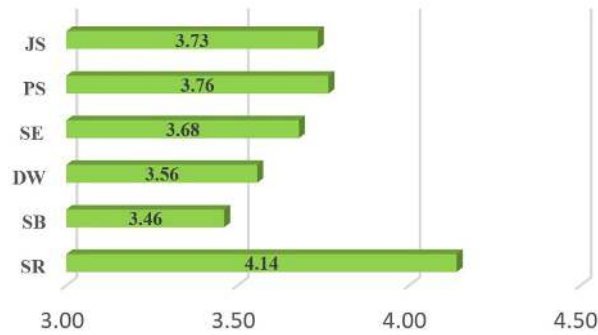


Fig 2. Level of employee satisfaction in 86 Company Ltd.

According to the surveyed data, with the mean value of 4.14/5, the social relationship in the workplace is appraised as the most satisfied employees. The criteria of disposition of work, psychophysiology; safety and working environment; and salaries and bonuses are assessed at the relatively satisfactory level. In order to create more satisfaction of employees on working conditions, solutions should be aimed at enhancing workers' sense of safety and good working environment, of suitability in disposition of work and of pleasure in work.

4.1. Solutions on working environment and safety

- To issue and strictly implement the regulation on technical management, working process.

Strictly implementing the regulations on technical management and working procedures will help increase workers' respect for labor discipline, and reducing number of accidents at work. At present, 86 Company Ltd., has issued regulations on technical management, and working procedures in every specific types of work. However, it is necessary to have more popularization, awareness education and supervision of the implementation of the technical management, working process and the handling of violations of regulations.

- Improving working environment by the installation the system of dust suppression at working face (where dust is generated) and the transport equipment as well as the system of declining noise at wind-blowers (main noise generation), of handrails and enough steps at sloping tunnels

- Improving the technology

According to the interviews with some workers and managers of the company, the newer technology of exploitation is used, the more safety and better working environment they have and the more job satisfaction is created. The innovation in technology such as increasing the proportion of coal exploited by hydraulic props or sublevel-caving hydraulic support will significantly improve the working conditions of the mining workers such as reducing dust, noise, reducing heavy work and creating more workspace.

- Strengthen the training on safety and risk identification

All workers at the company are provided safety training courses before starting the working process. Despite of that, in fact, due to shortage of safety competence of workers and managers, there is still safety violation at workplaces. Therefore, in safety courses, employees should be offered modern technics to identify risk, to understand safety and to encourage workers with self-consciousness to implement safety rules.

4.2. Solutions on disposition of work

- Improving the working environment

A good place to work can motivate employees to utilize their intellectual ability. Therefore, it is necessary to arrange and to assign duties to employees adequately with their ability to promote their available positions and to create their comfort and love of work.

- Strengthening professional training for employees:

Increasing labor productivity is the goal of both the employees and the company. The company needs to strengthen professional training for employees and to help them understand the work, increase the competently, thereby increasing labor productivity, understanding and interest in working.

4.3. Solutions on psychophysiology

- Strengthening the fair treatment to labors: Equitable treatment to labors plays an important role in creating a good working environment, motivating and promoting their ability. Therefore, the company should eliminate discrimination on gender, ethnicity, social composition, marital status, religion, and health status, etc. In addition, the company should implement and ensure the reasonable and fair salary regulations.

- Strengthen the dialogue and listening to the opinions of employees:

All employees have the right to contribute ideas to the development and construction of the company, thus it is necessary to motivate better communication between workers and managers, and respect opinions of employees about their work

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