

## The Measurement Model for Freelance Worker Performance Employed by Middle Class Contractor to Improve the Quality of Building

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### ABSTRACT

Improving the quality of freelance worker (foreman, skilled worker and unskilled laborer) has important role in improving the quality of the building. The objectives of this research to determine the main factors that affect the quality of freelance worker and establish the most proper steps in improving the quality of freelance workers. The research was carried out in 40 middle class contractors in Malang. The data was collected through questionnaire and interview. The AHP method (*Analytical Hierarchy Process*) was implemented in order to select alternative solutions. The analysis result recommends that there are three most important items that correlate with the improvement of freelance worker performance, the advance and the change of technology, the business competition among companies, the management demand to improve working standard.

**Keywords:** freelance worker, Contractors, Building Quality.

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### INTRODUCTION

The phenomenon of construction failure (bridge, road, building, canal, ground retaining wall, etc) found in both government and private projects can not be denied. . The construction failure often causes both material and non-material losses, especially those closely related to the human safety. The identified reason comes from the poor implementation quality and lack of knowledge among the contractors that can cause fatal effect on the construction process [1].

According to Law 25/1997 [2], the worker is any man or woman who works, whether in or outside of the employment contract to produce goods or services to meet public demand. While the quality of labor is defined as the quality characteristics of workers in meeting the service needs user. while kinney et al., [3,4], stated the human resources of the contractor is the driving force of the company. Therefore, human resource management contractor should support the company's main activities.

Abdel-Razek [5], stating the precise measurement of productivity in the workforce can be used as a reliable indicator of labor in the performance improvement project. Ng & Tang [6] declared three components of managerial performance, financial performance and the performance of labor is the decisive factor in the success of the project. On the improvement of labor quality, Maloney, Wiliam [7,8] stated that there are 4 variabels that affect the worker performance; worker motivation, level of knowledge and skill, level of physical and mental capacity of management effectiveness in organizing the tasks and the availability of needed resource. Fryer [9] claimed that individual performance is affected by 10 factors; ability and skill, motivation, type of occupation, occupational experience, personality, the clarity of regulation, pay off, and pressure. Foster and Seeker [10] stated that poor quality/performance in carrying out the task is caused by lack of knowledge and skill in performing the task assigned to individual, lack of motivation to perform well, and lack of individual self confidence in actualizing his/her occupational capacity.

However, in previous research have not done research in more detail what the main factors affecting the performance of freelance workers employed, so the objective of this research is to determine the main factors from internal and external factors that could influence the performance of freelance workers employed by middle class contractor. The study will attempt to find the dominant factors that have the most important role in improving the performance of freelance workers.

### MATERIALS AND METHODS

#### Conceptual Framework

The influential factors in the improvement of freelance worker quality (foreman, skilled worker and unskilled laborer) employed by contractor consists of the following variables:

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The internal factors that influence the quality of freelance worker:

- A. The variables of motivation aspect: Providing reward for working achievement; providing skill training; working skill; interest, aptitude, working proficiency and working experience; the availability of health and safety insurances as well as safety, health, employment (K3); the definite income source/the continuity of occupation.
- B. The variables of working environment: the fair treatment for all workers by company; the strict monitoring by superordinate; secured feeling and healthy competition in working place; the implementation of *Total Quality Management* by superordinates; the organizational experience of employees.
- C. The variables of salary/wage aspect: worker has ever carried out task with the same type; the conformity between wage and the produced work volume; education; worker age; discipline and responsibility in carrying out the task; the experience of attending standard occupational training.

The external factors that influence the quality of freelance worker:

- D. The variables of economy aspect: The national economy condition that grows and develops; the government policy/regulation in relation to employment; cost and time needed for worker training.
- E. The variables of technology aspect: The advance and the change of technology; the managerial demand to improve working standard.
- F. The variables of business competition aspect: The business competition among companies; the policy from the head of company; the proper improvement for compensation and facility provided for the employees.

Systematically, the structure of conceptual framework in relation to the correlation among the variables can be seen in Figure 1.

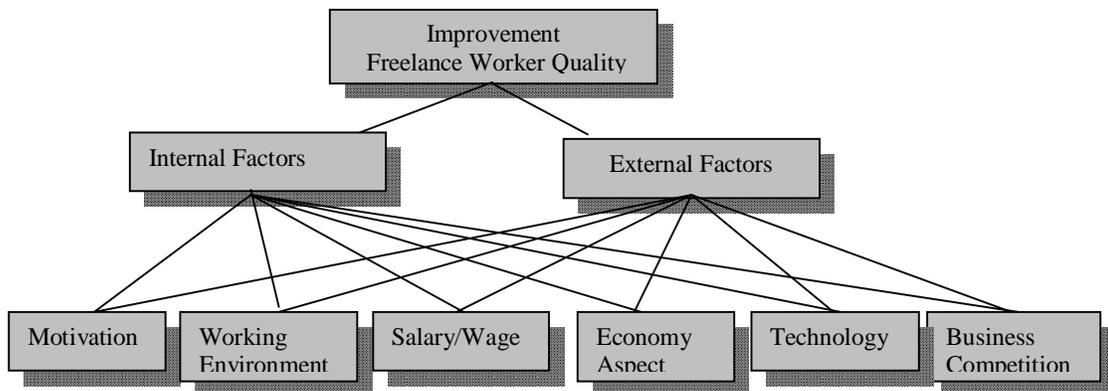


Figure 1: Conceptual Framework for Research

### Data Collection Techniques

The research was carried out in middle class contractors in Malang and surrounding area. The respondents are project leaders who are still active in managing projects. The survey respondents consist of 40 contractors and they are chosen randomly from the population of middle class contractors. The pilot interview was conducted for some middle class contractors and its result functioned as feedback to design questionnaire. The interview used was semi-structure interview in which the questions and their responses had been determined before and there was opportunity to elaborate the predetermined response through giving open response. Questionnaire was used to provide the wider response from respondents about the condition found in real practice. The questionnaire used was closed questionnaire in which each question already had predetermined response and respondent was only asked to fill the proper response with the help of instruction. Respondent also had opportunity to provide other responses. The measurement used in the research was Likert scale 1-5 from very low, low, medium, high to very high level of significance. Score 1 means the small tendency in giving contribution to the improvement of freelance worker quality, while score 5 means the very high tendency in providing contribution to the improvement of freelance worker performance.

### Analysis Method

To determine strategic steps in an effort to improve the quality of freelance workers employed by contractors, the AHP method (*Analytical Hierarchy Process*) was used. AHP is decision supporting system that has capacity to analyse complex multi-factorial problems and disentangle them into hierarchy in which

each level in the hierarchy comprises of certain specific elements. With hierarchy, any complex and unstructured problem can be separated into its groups and those groups can be reorganized into a form of hierarchy. Then it is followed by the composition of combined matrix, the vertical processing and priority vector estimation and from the result the most important variables that have correlation with the quality improvement of freelance worker can be determined.

**RESULTS AND DISCUSSION**

**The Description of the Significance Level of Internal Factors**

**Table 1. The Description of the Significance Level of Motivation Aspect as One of Internal Factors**

Sub Criteria	TP	KP	D	P	SP	Cumulatif Importan Respon
A1	7.7	7.7	30.8	53.8	0.0	84.6
A2	0.0	7.7	30.8	30.8	30.8	92.3
A3	0.0	15.4	23.1	30.8	30.8	84.6
A4	7.7	15.4	23.1	46.2	7.7	76.9
A5	0.0	0.0	69.2	23.1	7.7	100.0

Source: Primary Data was processed, The Appendix for Significance Response Description

Description: SP = Very Important; P = Important; D = Considered; KP = Less Important; TP = Not Important

A1 = Achievement Reward; A2 = Training Provision; A3 = Interest and Aptitude; A4 = Insurance; A5 = Definite income.

From Table 1. That shows the description of significance level of 5 item cost motivation aspect, it can be concluded that positive response from respondents ranges from 76.9% to 100%. These results function as the strong base for consideration that the five motivation aspects for internal factors will be included into hierarchy levels in AHP.

**Table 2. The Description of the Significance Level of Working Environment Aspect as two of Internal Factors**

Sub Criteria	TP	KP	D	P	SP	Cumulatif Importan Respon
B1	0.0	7.7	30.8	38.5	23.1	92.3
B2	0.0	23.1	38.5	38.5	0.0	76.9
B3	0.0	15.4	46.2	30.8	7.7	84.6
B4	0.0	7.7	30.8	46.2	15.4	92.3
B5	23.1	15.4	23.1	38.5	0.0	61.5

Source: Primary Data was processed, The Appendix for Significance Response Description

Description : B1 = The fair treatment for all workers by company; B2 = The strict monitoring by superordinate; B3 = Secured feeling and healthy competition in working place; B4 = The implementation of *Total Quality Management* by superordinates; B5 = The organizational experience of employees.

From Table 2. That shows the description of significance level of 5 item Working Environment aspect, it can be concluded that positive response from respondents ranges from 61,5%-92,3%. These results function as the strong base for consideration that the five Working Environment aspects for internal factors will be included into hierarchy levels in AHP.

**Table 3. The Description of the Significance Level of Salary/Wage Aspect as three of Internal Factors**

Sub Criteria	TP	KP	D	P	SP	Cumulatif Importan Respon
C1	7.7	15.4	46.2	23.1	7.7	76.9
C2	0.0	7.7	38.5	38.5	15.4	92.3
C3	0.0	15.4	30.8	46.2	7.7	84.6
C4	0.0	7.7	7.7	69.2	15.4	92.3
C5	0.0	23.1	23.1	53.8	0.0	76.9

Source: Primary Data was processed, The Appendix for Significance Response Description

Description : C1 = Worker has ever carried out task with the same type; C2 = The conformity between wage and the produced work volume; C3 = Education; Worker age; C4 Discipline and Responsibility in carrying out the task; C5 The experience of attending standard occupational training.

From Table 3. That shows the description of significance level of 5 item Salary/Wage aspect, it can be concluded that positive response from respondents ranges from 76,9%-92,3%. These results function as the strong base for consideration that the five Salary/Wage aspects for internal factors will be included into hierarchy levels in AHP.

#### The Description of the Significance Level of External Factors

**Table 4. The Description of the Significance Level of Economy Aspect as One of External Factors**

Sub Criteria	TP	KP	D	P	SP	Cumulatif Importan Respon
D1	0.0	23.1	30.8	30.8	15.4	76.9
D2	0.0	15.4	30.8	38.5	15.4	84.6
D3	0.0	7.7	46.2	30.8	15.4	92.3

Source: Primary Data was processed, The Appendix for Significance Response Description

Description : D1 = The national economy condition that grows and develops; D2 = Kebijakan The government policy/regulation in relation to employment; D3 = Cost and time needed for worker training.

From Table 4. That shows the description of significance level of 5 item Economy aspect, it can be concluded that positive response from respondents ranges from 76,9%-92,3%. These results function as the strong base for consideration that the three Economy aspects for external factors will be included into hierarchy levels in AHP.

**Table 5. The Description of the Significance Level of Technology Aspect as Two of External Factors**

Sub Criteria	TP	KP	D	P	SP	Cumulatif Importan Respon
E1	0.0	23.1	30.8	46.2	0.0	76.9
E2	7.7	7.7	38.5	46.2	0.0	84.6

Source: Primary Data was processed, The Appendix for Significance Response Description

Description : E1 = The advance and the change of technology; E2 = The managerial demand to improve working standard.

From Table 5. That shows the description of significance level of 2 item Technology aspect, it can be concluded that positive response from respondents ranges from 76,9%-84,6%. These results function as the strong base for consideration that the three Technology aspects for external factors will be included into hierarchy levels in AHP.

**Table 6. The Description of the Significance Level of Business Competition Aspect as Three of External Factors**

Sub Criteria	TP	KP	D	P	SP	Cumulatif Importan Respon
F1	7.7	23.1	23.1	23.1	23.1	69.2
F2	0.0	7.7	30.8	46.2	15.4	92.3
F3	0.0	7.7	23.1	53.8	15.4	92.3

Source: Primary Data was processed, The Appendix for Significance Response Description

Description : F1 = The business competition among companies; F2 = The policy from the head of company; F3 = The proper improvement for compensation and facility provided for the employees.

From Table 6. That shows the description of significance level of 3 item Business Competition aspect, it can be concluded that positive response from respondents ranges from 69,2%-92,3%. These results function as the strong base for consideration that the three Business Competition aspects for external factors will be included into hierarchy levels in AHP.

#### Comparative Matrix

The following is the result of paired comparative matrix for significance level in each criteria and sub-criteria.

**Table 7. Paired Comparative Matrix as Main Criterion**

Kriteria	A	B	C	D	E	F
A	1.00	0.42	1.84	1.29	0.44	0.94
B	2.41	1.00	1.52	1.01	0.89	0.93
C	0.54	0.66	1.00	0.71	0.44	0.48
D	0.77	0.99	1.40	1.00	0.88	0.90
E	2.25	1.13	2.25	1.14	1.00	0.96
F	1.06	1.07	2.08	1.12	1.04	1.00

Description: A = Motivation; B = Working environment; C = Salary/wage; D = Economy; E = technology; F = Business competition.

**Table 8. Paired Comparative Matrix for Motivation as Sub Criteria**

Sub Kriteria	A1	A2	A3	A2	A3
A1	1.00	0.56	0.98	1.21	1.81
A2	1.78	1.00	0.63	1.48	1.46
A3	1.02	1.60	1.00	2.02	2.00
A4	0.83	0.67	0.49	1.00	1.62
A5	0.55	0.68	0.50	0.62	1.00

Description: A1 = Achievement reward; A2 = Training provision; A3 = Interest and aptitude; A4 = Insurance; A5 = Definite income continued in the same way paired comparison matrix calculation to work, the environment of salary / wages, economic, technological competition, the business as a sub criterion.

After the make matrix of pairwise comparisons for each sub-criteria then followed several stages of the process include: Evaluation of consistency for the entire hierarchy, and get a comparison Synthesis of priority, the revised comparative matrix in pairs, again the comparison and synthesis of local priorities, local priorities with advanced synthesis mangalikan priority main, so we get the final priority of each alternative and determine the rank order of the continuing value of the largest, as shown in the table below

**The Result of Analytical Hierarchy Process (AHP)**

**Table 9. The Weight of Significance Level for Each Main Criterion**

Criteria	Item Weight	Ranking
<b>Internal Factor</b>		
A. Motivation	14.46	5
B. Working environment	19.50	2
C. Salary/wage	9.87	6
<b>Eksternal Factor</b>		
D. Economy	15.67	4
E. technology	21.61	1
F. Business competition	18.89	3

Consistency Ration (CR) = 0.027

Based on the weight of significance level for each criterion shown in the table above, the criteria sequence of factors that influence the decision of alternative selection is obtained as follows: (1) Technology (21.61%), (2) working environment (19.50%), business competition (18.89%), economy (15.67%), motivation (14.46%) and salary/wage (9.87%). Further, estimation result shows that the value of *Consistency Ration* (CR) is 0.027 (less than 0.10). It shows that paired comparative matrix for main criteria is consistent.

The above result shows that technology aspect is the most considered category as factor that influence the improvement of worker quality. The underlying reason is that the comparison of technology aspect aids workers in carrying out the project tasks.

**The Weighing of Sub Criteria**

**a. Motivation**

**Table 10. Weight of Significance Level for Motivation as Sub Criteria**

Sub Criteria	Deskripsi	Item Weight	Ranking
A1	Achievement reward	20.17	3
A2	Training provision	23.17	2
A3	Interest and aptitude	28.04	1
A4	Insurance	16.18	4
A5	Definite income	12.43	5

Consistency Ratio CR = 0.024

From Table 10, it can be seen that interest and aptitude (A3) has the biggest weight compared to other items; 28.04%. It means that the development of interest and aptitude is the most significant item or the most considered item in relation to motivation. Moreover, the estimation result shows that the value of *Consistency Ratio* (CR) is 0.024 (less than 0.1). It shows that paired comparative matrix for items in motivation as sub criteria is already consistent.

#### b. Working Environment

**Table 11. Weight of Significance Level for Working Environment as Sub Criteria**

Sub Criteria	Deskripsi	Item Weight t	Ranking
B1	Fairness among workers	22.16	3
B2	Monitoring by leaders	22.42	2
B3	Safety in carrying out the task	14.84	5
B4	Implementation of TQM	17.36	4
B5	Organizational experience	23.21	1

*Consistency Ratio* CR = 0.050

From Table 11, it can be seen that Organizational experience (B5) has the biggest weight compared to other items; 23,21 %. It means that the development of interest and aptitude is the most significant item or the most considered item in relation to Working Environment. Moreover, the estimation result shows that the value of *Consistency Ratio* (CR) is 0.050 (less than 0.1). It shows that paired comparative matrix for items in Working Environment as sub criteria is already consistent.

#### c. Salary/Wage

**Table 12. Weight of Significance Level for Salary/Wage as Sub Criteria**

Sub Criteria	Deskripsi	Item Weight	Ranking
C1	Working experience	16.35	4
C2	Conformity with working volume	17.07	3
C3	Education and age	25.31	2
C4	Discipline and responsibility	13.88	5
C5	Attendance for Working	27.39	1

*Consistency Ratio* CR = 0.020

From Table 12, it can be seen that Attendance for Working (C5) has the biggest weight compared to other items; 27,39 % . It means that the development of interest and aptitude is the most significant item or the most considered item in relation to Salary/Wage. Moreover, the estimation result shows that the value of *Consistency Ratio* (CR) is 0.020 (less than 0.1). It shows that paired comparative matrix for items in Salary/Wage as sub criteria is already consistent. .

#### d. Economy

**Table 13. Weight of Significance Level for Economy as Sub Criteria**

Sub Criteria	Deskripsi	Item Weight	Ranking
D1	National economy condition	31.17	2
D2	Government policy for employment	27.14	3
D3	Cost and Time for worker training	41.68	1

*Consistency Ratio* CR = 0.081

From Table 13, it can be seen that Cost and Time for worker training (D3) has the biggest weight compared to other items; . 41,68%.. It means that the development of interest and aptitude is the most significant item or the most considered item in relation to Economy. Moreover, the estimation result shows that the value of *Consistency Ratio* (CR) is 0.081 (less than 0.1). It shows that paired comparative matrix for items in Economy as sub criteria is already consistent

#### e. Technology

**Table 14. Weight of Significance Level for Technology as Sub Criteria**

Sub Criteria	Deskripsi	Item Weight	Ranking
E1	Advance and change of technology	60.93	1
E2	Demand of working standard improvement	39.07	2

*Consistency Ratio* CR = 0.000

From Table 14, it can be seen that Advance and change of technology (E2) has the biggest weight compared to other items; . 60,93%.It means that the development of interest and aptitude is the most significant item or the most considered item in relation to Technology. Moreover, the estimation result shows that the value of *Consistency Ratio* (CR) is 0.000 (less than 0.1). It shows that paired comparative matrix for items in Technology as sub criteria is already consistent

**f. Business Competition**

**Table 15. Weight of Significance Level for Business Competition as Sub Criteria**

Sub Criteria	Deskripsi	Item Weight	Ranking
F1	Business competition among companies	47.61	1
F2	Policy from leader of company	31.66	2
F3	Compensation improvement	20.73	3

*Consistency Ratio* CR = 0.001

From Table 15, it can be seen that Business competition among companies (F1) has the biggest weight compared to other items; . 47,61%.It means that the development of interest and aptitude is the most significant item or the most considered item in relation to Business Competition. Moreover, the estimation result shows that the value of *Consistency Ratio* (CR) is 0.001 (less than 0.1). It shows that paired comparative matrix for items in Business Competition as sub criteria is already consistent.

**The Last Weighing for Each Factor**

**Table 16. The Last Weight for All Items of Factors That Influence The Performance of Freelance Worker Employed by Contractor**

Criteria (Factor)	Item	Criteria Weight	Item Weight in Criteria	The Last Weight for Item	Ranking
<b>Motivation</b>		0.145			
Achievement reward	A1		0.202	0.029	15
Training provision	A2		0.232	0.034	14
Interest and aptitude	A3		0.280	0.041	11
Insurance	A4		0.162	0.023	19
Definite income	A5		0.124	0.018	20
			1.000		
<b>Working Environment</b>		0.195			
Fairness among workers	B1		0.222	0.043	9
Monitoring by leaders	B2		0.224	0.044	8
Safety in carrying out the task	B3		0.148	0.029	16
Implementation of TQM	B4		0.174	0.034	13
Organizational experience	B5		0.232	0.045	7
			1.000		
<b>Salary/Wage</b>		0.099			
Working experience	C1		0.163	0.016	22
Conformity with working volume	C2		0.171	0.017	21
Education and age	C3		0.253	0.025	18
Discipline and responsibility	C4		0.139	0.014	23
Attendance for Working	C5		0.274	0.027	17
			1.000		
<b>Economy</b>		0.157			
National economy condition	D1		0.312	0.049	6
Government policy for employment	D2		0.271	0.043	10
Cost and Time for worker training	D3		0.417	0.065	4
			1.000		
<b>Technology</b>		0.216			
Advance and change of technology	E1		0.609	<b>0.132</b>	<b>1</b>
Demand of working standard improvement	E2		0.391	<b>0.084</b>	<b>3</b>
			1.000		
<b>Business Competition</b>		0.189			
Business competition among companies	F1		0.476	<b>0.090</b>	<b>2</b>
Policy from leader of company	F2		0.317	0.060	5
Compensation improvement	F3		0.207	0.039	12
			1.000		
<b>Total</b>		<b>1.000</b>		<b>1.000</b>	

Description : The Last Weight for Item = Criteria Weight x Item Weight in Criteria

From Table 16, that shows Three most significant items that have correlation with the improvement of worker quality include (1) the advance and change of technology with the item last weight of 13.2%, (2) the business competition among companies with the item last weight of 9% and (3) the demand of working standard improvement with the item last weight of 8.4%.

Phases obtained from the above calculation are some things that a major factor in improving the performance of freelance worker the *kontaraktor* are as follows

The description of significance level from three aspects of **internal factors** including motivation aspects, working environment aspect, salary/wage aspect shows that the positive response from respondents ranges from 61.5% to 100%. For **external factors** including economy aspect, technology aspect, business competition aspect, it can be seen that the positive response from respondents ranges from 69.2% to 92.3%. These findings function as the strong base in considering that internal factors and external factors must be included in hierarchy levels in AHP.

Based on the significance weight for each criterion in the table above, the criteria sequence of factors that influence the decision of alternative selection is obtained as follows: (1) Technology (21.61%), (2) working environment (19.50%), business competition (18.89%), economy (15.67%), motivation (14.46%) and salary/wage (9.87%). Further, estimation result shows that the value of *Consistency Ration* (CR) is 0.027 (less than 0.10). It shows that paired comparative matrix for main criteria is consistent.

Interest and aptitude (A3) is 28.04% with *Consistency Ration* (CR) value of 0.024. Organizational experience (B5) is 23.21% with (CR) value of 0.050. The attendance of working training (C5) is 27.39% with (CR) value of 0.020. The time and cost for worker training (D3) is 41.68% with (CR) value of 0.081. The advance and change of technology (E1) is 60.93% with (CR) value of 0.000. The business competition among companies (F1) is 47.61% with (CR) value of 0.001. The weight percentage above is the biggest weight percentage from each sub criteria of internal and external factors and with *Consistency Ration* (CR) value less than 0.1. It shows that paired comparative matrix for items in sub criteria is consistent.

Three most significant items that have correlation with the improvement of worker quality include (1) the advance and change of technology with the item last weight of 13.2%, (2) the business competition among companies with the item last weight of 9% and (3) the demand of working standard improvement with the item last weight of 8.4%.

On the improvement of labor quality, Maloney, Wiliam [7,] stated that there are 4 variabels that affect the worker performance; worker motivation, level of knowledge and skill, level of physical and mental capacity of management effectiveness in organizing the tasks and the availability of needed resource. Fryer [9] claimed that individual performance is affected by 10 factors; ability and skill, motivation, type of occupation, occupational experience, personality, the clarity of regulation, pay off, and pressure. Foster and Seeker [10] stated that poor quality/performance in carrying out the task is caused by lack of knowledge and skill in performing the task assigned to individual, lack of motivation to perform well, and lack of individual self confidence in actualizing his/her occupational capacity.

whereas Kaming, Peter F [11] stated that the eleven items studied are reliable for broader future use in diagnosing the severity of construction productivity, ranking eleventh item of the first order is: Interference, lack of materials, absenteeism, repeating a job, changing the craftsmen, equipment breakdown, excess capacity, delay control, lack of equipment, change the foreman

## CONCLUSION

Three most significant items that have correlation with the improvement of worker quality include (1) the advance and change of technology (2) the business competition among companies and (3) the demand of working standard improvement

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