

# IMPACT OF MULTI-SKILL WORKERS FACTOR ON COMPETITIVENESS

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## ABSTRACT

Recently, the demand for well-developed and expert human resources is changing more quickly than the human resources themselves. Therefore, it is necessary to build a new strategy for the human resource development. Only high-quality workers of knowledge may carry and sustain a competitive advantage and only such multi-skill workers can follow the modern day business operations, characterized by quick, dynamical, complex and unpredictable changes. The focus of this is to show the degree of the multi-skill workers factor in the cement industries in Libya. The study design combines two types of data collection methods, questionnaires and semi- structured interviews. T-Test and F- test used through a simple linear regression to identify the study model. Finally, the study emphasizes that the importance of multi-skill workers factor in improving product competitiveness.

**Keywords:** *MSK, multi-skill workers; COM: competitiveness, WIP: work in process, CF; cement factory.*

## 1. INTRODUCTION

This research seeks to explore the availability of multi- skill workers in Libyan environment, focusing on cement manufacturing. Furthermore to understand the significance of this subject, this study tries to know the degree of the multi-skill workers factor as one of the most factors that has an impact on product competitiveness. Because in traditional manufacturing systems, it's usual for workers to be limited skills, they cannot do number of processes such as; it is necessary to have worked to operate machine, another one for maintenance, and another one for inspection quality. However, the concept of multi-skill workers mean that, they must be good training to have a diversity of skills and talents, they must be multi-skilled which give them flexibility in doing many jobs, also doing other workers' jobs when needed beside their main work. In addition to; train them to do some maintenance and small repairs. Also, this study seeks to prove the impact of the well training workers in the increasing competitive position of the cement manufacturing products in Libya.

Many points should consider for instance; allowing workers to become a participant in decision- making by putting the trust and responsibility in their hands, focused on training and educational programs to educate all facilities, and workers to insure their positive interactions, Respect, support, and encourage the workers, Finally, the importance of worker's satisfaction, Education and continuous development, all that would be helpful to face the global competition

## 2. STATEMENT PROBLEM

The lack of high level workers is one of the problems that face the competitive position of cement products in Libya. Given what has been mentioned in the literature about production methods, many studies showed that whenever the company is more efficient, least amount of inputs is required to produce outputs, so it results in less production cost and high quality. However, the most important problem for cement products industries in Libya is using a huge amount of the material, and a big number of workers to produce fewer outputs. Thus, the need of increasing the capacity and improving the products' competitiveness by applying the new industrial methods depending on multi-skill workers is the main reason to search in this area.

## 3. OBJECTIVES OF STUDY

- 3.1 Evaluate the degree of multi-skill workers factor in cement factory.
- 3.2 Prove the positive impact of multi-skill workers factors on competitive position.

## 4. THE STUDY QUESTIONS

- 4.1 Are there enough qualified personnel; in place with the right technical information and experience are enough to maximize the product competitiveness?
- 4.2 Is there positive impact of multi-skill workers factor in increasing production competitiveness?

## 5. THE STUDY HYPOTHESES

- 5.1** Multi-skill workers have a positive impact on increasing the production competitive position.
- 5.2** There is a statistically significant difference from the respondents' perspectives about the impact of the multi-skill workers factor in increasing the production competitiveness due to the experience.

## 6. THE STUDY SCOPE

Because of the lack of published material in this area and the existing literature is rather limited, this research provides a contribution to the subject of the Libyan cement industry's growth by analysing the necessary data, to evaluate the degree of the multi-skill workers sources improve production competitiveness, that are represented in the target factory, which is Cement factory in Libya.

## 7. THE DEVELOPMENT OF THE THEORETICAL CONCEPTUAL MODEL

The expectation confirmation theory is cognitive theory that attempts to describe post- purchase or post- adoption, satisfaction as a purpose of anticipation. This theory was written by Oliver in 1980 and has been used in many studies (Mittal & Gera, 2012).

Based on the idea of this theory, this study took the concept of the relationship between the multi-skill workers and competitiveness, as shown in figure 1.

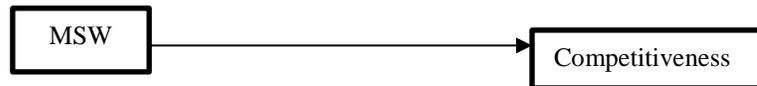


Figure 1: The Impact of the MSW on Competitiveness

## 8. METHODOLOGY

This study was conducted using different kinds of methodological. The research design combines two types of data collection methods, questionnaires and semi- structured interviews, as well as add reflection from own experience and involvement in the accounting area in the Libyan oil industry.

The first phase of data collection method is done through a questionnaire. The quantitative approach of gathering information serves as the main tool of data collection in this study. The objective of the questionnaire is to obtain the data to answer the research questions and test the hypotheses related to the impact of the multi-skill worker as a main factor on the competitiveness.

According to Aaker et al., (2001), the questionnaire questions are designed to achieve the research objectives and to enable a validation of the answers obtained [7]. The questionnaire consists of three sections.

The first section deals with the demographic characteristic of the study sample, age, education, experience, job title. The second section consists of many questions to judge the current system, focusing on the file on a multi-skill workers and its availability in the target factory to achieve the first objective and to answer the first question of this study, which is the availability of the multi-skill workers factor in the cement factory. This part consists of some questions about the education level, the level of training programs, team working, participation, encourage the development, rewards, cooperative environment, multi- skill worker, multi- shifted work and, the number of workers.

The third part includes many questions to explore the impact of the multi-skill workers on the competitiveness, from the respondents' perspectives such as: error correction, reduce inventory, reduce unnecessary activities, and reduce defects and damage. This part is developed to achieve the second objective and to answer the second question from the study questions, and to verify whether to accept or reject the first hypothesis, which is about the impact of the multi-skill workers factor in improving the competitiveness.

## 9. DATA ANALYSIS

For the statistical processing, one sample- T-Test, simple linear regression has been used in order to test each item of the questionnaire, and know the significance of the answers of the respondents.

The researcher used the regression analysis to achieve the study objectives of examining the impact of the independent variable on the dependent variables. Thus, explaining whether the model is successful in presenting what might contribute to the independent variable in better responding.

### 9.1 VALIDITY OF THE STUDY

The internal consistency was concluded through using Pearson correlation between each item from the area of the questionnaire and the total score of the field itself. The results of the internal validity of the study tool are as follows:

Table 1: Pearson Correlations between MSW and Total Score

Items	N	C	P
The education level is important	200	0.650	0.000
The workers in the factories have limited skills	200	0.503	0.000
The team work groups are ignored	200	0.652	0.000
Encouraging worker development	200	0.689	0.000
The work program in the factory is multi- shifted program	200	0.550	0.000
The workers satisfactory are ignored	200	0.668	0.000
The personnel training to the workers is ignored	200	0.781	0.000
The incentive rewards program is ignored	200	0.518	0.000
The number of workers exceeds the factory needs	200	0.673	0.000

Table 1 shows that, the Pearson correlations between the items of the first part, multi-skill workers, and the total score ranges between, 0.503 to 0.781. Therefore, all the items have correlations  $\geq 0.5$  and consider valid to what is intended to measure.

Table 2: Pearson Correlation between MSW and Total Score

Items	N	C	P
Multi- skill workers increase the level of the error correction	200	0.618	0.000
Multi- skill workers help in reaching a zero inventory level,	200	0.561	0.000
Multi-skill workers help in eliminating unnecessary activities	200	0.616	0.000
Multi-skill workers help in reducing the defects and damage ration	200	0.503	0.000
Multi- skill workers help in applying a good coordinate between the processing production department	200	0.598	0.000
Multi- skill workers help in determining the value of sales	200	0.552	0.000

The above table shows that the correlation set out in the table are statically significant, all items  $\geq 0.5$ . As a result this part considers valid to what is intended to measure.

Table 3: Pearson Correlation between COM and Total Score

No	Items	N	Parson correlation	P- Value
1	Multi- skill workers increase the quality of the products, which in turn will lead to improve the factory competition	200	0.649	0.000
2	Multi-skill workers help in creating logical, appropriate for the real demand and product design	200	0.523	0.000
3	Multi-skill workers help in determining the products' specifications, thus increasing the costumer's desires in the factory products	200	0.594	0.000
4	Multi-skill workers help in reducing costs and increase the competition	200	0.515	0.000
5	Multi-skill workers help in solving the problems that the products face during processing	200	0.513	0.000
6	Multi-skill workers consider Customers' desires	200	0.567	0.000
7	Multi-skill workers help in applying the quality control program	200	0.716	0.000

## 9.2 RELIABILITY OF THE STUDY

The researcher followed the statistical measurements to determine the reliability of the research tool through Cronbach's alpha coefficient, as following:

Table 4: The Value of Internal Consistency of the Research Variables

No	Research variables	Items	Alpha
X 1	Multi-skill workers	9	0.720
X 2	Competitiveness	7	0.711
Total		16	0.731

## 10. STATISTICAL ANALYSIS

### 10.1 THE AVAILABILITY OF MULTI-SKILL WORKERS

#### 10.1.1 FIRST: INTERVIEW ANALYSIS

In order to achieve the first objective and answer the first question, the interview was conducted to examine the availability of multi-skill workers in the mentioned factory. Managers interviewed were asked about the availability of this factor. Table 5 summarized the answers of the interviewees to the first question.

The Response Rate

Code	Statement	N= 19	
	Do multi-skill workers available in Cement factory?	Frequencies	Per cent
1-1	Yes, there are multi-skill workers	9	47 %
1-2	No, there are not available	6	33 %
1-3	There is a level of them	4	22 %

From the above table, one can easily note that about 33 % of the respondents emphasized that multi-skill workers do not available in the factory. However, there is some of them; this opinion asserted by 69 % of the respondents.

### 10.1.2 SECONND: QUESTIONNAIRE ANALYSIS

Table 6 shows the mean, frequency distribution and T- test of the respondents' answers about the multi-skill workers factor, in order to know whether or not this factor is available.

Table 6: T-test Statistics for MSW Variable

Items	Mean	Std	T- test	P- value
The education level is important	3.71	0.934	11.990	0.000*
The workers in the factories have limited skills	2.40	0.878	- 10.657	0.000*
The team work groups are ignored	2.39	0.838	-11.384	0.00*0
The factory management ignores encouraging worker development	3.016	1.076	2.306	0.022*
The work program in the factory is multi- shifted program	4.07	0.883	19.022	0.000*
The workers satisfactory are ignored	1.66	0.834	- 25.177	0.000*
The personnel training to the workers is ignored	2.38	1.048	-9.289	0.000*
The incentive rewards program is ignored	2.31	0.828	-13.142	0.000*
The number of workers exceeds the factory needs	3.12	1.101	1.733	0.084*

As presented in the above table, the multi-skill worker's items in decreasing rank order as following:

The work program is multi-scheduling program  $M= 4.07$ ,  $Std, =833$ ,  $P < 0.05$  recorded in the first highest rank. This result refers to the workers that are multi-skilled workers, because the factories follow a mixed scheduling work program, which means that, the workers are multifunctional skills because 71.3 % of the respondents disagree that the workers have limited-skills  $M= 2.40$ ,  $Std =0.878$ ,  $P < 0.05$ .

This finding is in the line with the view suggested by Ngo, et al., (2008), who reported that the workers must be well-trained to have a diversity of skills and talents, which gives them flexibility in doing many jobs and to do other workers' jobs when needed [8]. And the work multi scheduling program should be considered to give the workers more time to their social life, which mirrors workers' satisfaction.

The second highest ranking is to the item, the education level is important,  $M= 3.71$ ,  $Std = 934$ ,  $P < 0.05$ ; about 78.5 % of respondents agreed with this item. This supported the opinion of Marchington & Wilkinson (2008) who suggested that learning is a beneficial approach for improving productivity of labour is measured by the required time to complete the task as well as increase competitiveness, which means that it helps workers to earn more skills.

Finally, the overall mean of the availability of the multi-skill workers factor  $M= 2.80$ ,  $Std= 0.935$ ,  $P < 0.05$ . These findings showed some agreement about the availability of the multi-skill workers factor in the cement factory, which indicates that there is a level of them.

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Table 7: Descriptive Statistics for COM

No	Rank	Item	Agree	Disagree	Mean	SD	T- test	P-value
1	×	Multi-skill workers increase the quality of the products,	58.9%	37.2%	2.89	1.155	-1.488	0.138
2	7	Multi-skill workers help in creating logical, appropriate for the real demand and product design	13.8%	53.4%	2.52	0.859	-8.738	0.000
3	3	Multi-skill workers help in determining the products' specifications	45.7%	27.6%	3.16	1.002	2.477	0.014
4	1	Multi-skill workers help in reducing cost	58.1%	21.1%	3.41	0.995	6.457	0.000
5	2	Multi-skill workers help in solving the problems during processing	51.0%	19.4%	3.34	0.935	5.648	0.000
6	8	Multi-skill workers help in considering customers' desires	24.3%	53.2%	2.46	1.096	-7.723	0.023
7	4	Multi-skill workers help in applying the quality control program	47.7%	30.0%	3.15	1.031	2.284	0.011

Although, the answers for some items show a level of understanding about the role that multi-skill workers play in an improved competitiveness in the above table, the overall mean for this part is  $M= 2.99$ ,  $Std= 1.010$ ,  $p < 0.05$ . This means that the respondents somewhat agree that this factor increase the competitiveness, because of the lack in knowledge about this topic, and its importance in increasing the competitiveness through improving the product quality and reducing cost.

## 10.3 TESTING THE STUDY HYPOTHESES

### 10.3.1 TASTING THE FIRST HYPOTHESIS USING SIMPLE LINEAR REGRESSION

There is a statistical significant impact of the multi-skill workers factor on the competitiveness.

#### NULL HYPOTHESIS H0

There is no statistical significant impact of the multi-skill workers factor on the competitiveness ( $H_0: B_1=0$ ).

#### ALTERNATIVE HYPOTHESIS H1

There is a statistical significant impact of the multi-skill workers factor on competitiveness ( $H_1: B_1 \neq 0$ ). Where  $B_1$ = Regression coefficient of the independent variable on the dependent variable in the regression equation  $Y= B_1X+ B_0$ .

The researcher used the simple linear regression in the table 8 to verify this hypothesis as follows:

Table 8: Simple Linear Regression

Independent variable	Correlation coefficient	R Square	F- test	P- Value
MSW	0.091	0.008	2.036	0.155

The table 8 shows that the  $R=0.091$ ,  $F=2.036$ ,  $P > .05$ . This result can be interpreted as a meaning that, there is no a statistically significant impact at 0.05 levels between the multi-skill workers factor and the competitiveness. Thus, the null hypothesis is accepted ( $H_1: B_1 = 0$ ), and the alternative hypothesis ( $H_1: B_1 \neq 0$ ) is rejected, on the basis that there is no a statistically significant impact at 0.05 levels between multi-skill workers and the competitiveness, which is illogical.

The researcher thinks that this finding is as a result of the lack of knowledge about the role that multi-skill workers play in achieving competitive goals. Alternatively, many studies found that there seems to be a positive relationship between the workers and competition. These studies illustrated that the development of workers increases the flexibility and adaptively that are needed to pay attention from the management, because the development of workers take much more time than the structural and process intervention. (Edward & Rees, 2006; Sadikoglu & Zehir, 2010; Sugimori, 2007).

### 10.3.2 TESTING THE SECOND HYPOTHESIS

To test the differences in respondents' perspectives about the impact of multi-skill workers factor on the competitiveness due to experience; that requires testing the following hypotheses:

**H<sub>0</sub>:** there is no statistically significant difference at 0.05 levels in the respondents' perspectives about the impact of multi-skill workers factor on the competitiveness due to experience ( $H_0: M_1 = M_2 = M_3 = M_4$ ).

**H<sub>1</sub>:** There is a statistically significant difference at the 0.05 levels in the respondents' perspectives about the impact of multi-skill workers factor on the competitiveness due to experience ( $H_1$ : at least one of them different).

Table 9: Result of F-Test

Variable	Mean	Standard Deviation	F-Test	P-value
Less than 5 years	2.55	0.408		
5 to 15	2.58	0.419		
16 to 25	2.57	0.390		
More than 25	2.67	0.592		
Total	2.60	0.461	0.736	0.531

From the above table the overall  $M=2.60$ ,  $Std=0.461$ ,  $F=0.736$ ,  $P > 0.05$ . Thus, accept the null hypothesis, and reject the alternative hypothesis. Which means, to accept that, there is no statistically significant difference at the 0.05 level in the respondents' perspectives about the impact of multi-skill workers on the competitiveness due to experience.

## 11. CONCLUSION

This study discusses a new insight in managerial accounting in one of the developing countries, Libya. The availability of multi-skill workers in industrial environment can provide a number of advantages for example: decreasing storage cost, decreasing workforce, increasing the number of qualified experts and well trained personnel, and developing effective programs which in turn will directly and indirectly affect the restructuring and reorganizing the industrial sector in the local environment

To achieve the study objectives, a field study was conducted in the cement factory in Libya to know the extent of multi-skill workers, and to determine the impact of them on increase the efficiency and effectiveness of its role in increasing competitiveness. In fact the factories do have the main principle to consider that, some of the multi-skill

workers are available, however, this factor is not completely available, which reflect a lack of awareness of the necessity of availability of this factor.

Although, the research proved the importance of the multi-skill workers and their significant role in improving the competitiveness, the findings do not lend strong support to the role that this factor plays in improve competitiveness, which reflects the lack of awareness about the importance of the study topic, and that require far more research in this area.

In conclusion the research recommends some important point such as; the employment strategy need to develop and promote to levels that can provide the right number of workers that have a very good level of knowledge, all requirements related to workers development should be studied, such as authority should be given to workers after training them, opportunity of participating in decision-making and problem-solving, encouraging the development.

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