

## **Lean Production and Job Satisfaction: Perception of Workers in Plastics Manufacturing**

Edralin C. Lim  
De La Salle University

— *Review of* —  
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### **ABSTRACT**

In today's era of globalization, various sectors have been facing increasing competition. In order to compete and survive, companies have been under pressure to effectively produce faster at lower costs, thus capitalizing on technology to be both productive and profitable. To address demands, the application of lean management has allowed for the production of goods in the least amount of time whilst keeping the production cost low. Previous studies have provided insights on the effect of lean production on industries, but have not considered the effect of lean manufacturing on employee satisfaction. This study aims to examine the effect of lean production on perceived job satisfaction of workers in a plastic manufacturing company in Valenzuela. The researcher conducted a survey consisting of 40 workers in Techtron Industrial Corporation. This research examined which measures of lean production have affected perceived job satisfaction of workers in plastics manufacturing. The results of the study attested that lean production factors such as perceived total productive maintenance and perceived employee involvement positively affect the job satisfaction of workers. This study could provide awareness to the workers in plastics manufacturing regarding the significance of their role - how to thrive in lean production implementation.

Keywords: lean production; job satisfaction; continuous improvement

### **1. INTRODUCTION**

In today's era of globalization, several sectors have been continuously facing increasing competition, not only locally, but globally, as well. Customers demand goods that are both high in quality and affordable. In order to compete and survive, companies have been under tremendous pressure to effectively produce faster at lower costs, thus capitalizing on recent technologies and practices to be concurrently productive and profitable. To address such fast-changing demands in manufacturing, the application of lean management principles has allowed for the production of goods in the least amount of time while keeping the production cost low.

Although lean production tends to center around production principles, experts believe

that employees and their involvement in the production process is central to lean production. Astonishingly, studies that examined the effect of lean production on employees have been contradictory.

In the Philippines, only a few studies have looked into lean production. A study by Song-Kyoo Kim, (2015) studied how Toyota implements Lean Manufacturing. Another study by Amaya and Carpena (2016) revealed that cycle time was reduced which resulted to an increase in the net profit of the company.

So far, the cited studies have illustrated conflicting results on the relationship between the implementation of lean manufacturing on production and employee satisfaction. Locally, the dearth of research have only presented insights on the effects of lean production on industries, but have not investigated the effect of lean production on employee satisfaction. This study aims to examine the effect of lean production on perceived job satisfaction of workers in a plastic manufacturing company situated in Valenzuela City.

## **2. LITERATURE REVIEW**

Lean production or manufacturing is defined as “an integrated set of activities designed to achieve production using minimal inventories of raw materials, work-in-process and finished goods” (Parilla, 2019). Although lean production tends to center around production principles, some experts believe that employees and their involvement in the production process is central to lean production. Unexpectedly, studies that investigated the effect of lean production on employees have been opposing. Lean production represents a cohesive manufacturing system in its attempt at minimizing waste (Sim, Curatola, & Banerjee, 2015). Such system requires employees to assume responsibilities that are beyond what is typically called for in a mass production setting. Such situation requires employees that are skilled, have a certain level of commitment, and are willing to solve problems and take action in order to solve problems. If this is not the case, then the goal of minimizing waste is imperiled.

In a study by Hasle (2014), results demonstrate that lean production has a negative impact on job autonomy based on the perception of employees who performed simple manual labor. Bruno and Jordan (2002) showed employees’ disappointment in their work lives after the lean implementation.

While the studies cited above show the negative impact lean manufacturing has had on

employees, other studies show the opposite. A study by Rodriguez, Buyens, Van Landeghem & Lasio (2015) hypothesized that the implementation of lean production would improve perceived job autonomy and job satisfaction. The results presented a significant increase in perceived job autonomy and job satisfaction. Another study by Uslu (2015) exhibited that employee ownership improved job satisfaction, strategic human resource management, and the innovation culture of companies. The same finding was also found by Santos, Vieira, & Balbinotti, (2015) when they investigated the attitude of 40 employees of the automotive industry in Parana, Brazil. The researchers found that employees have a good response to the continuous improvements since adopting lean production. As a result, there has been a reduction in employee absenteeism since the introduction of better working conditions and improvement in income. Furthermore, employees' resistance to change, the company's failure to motivate employees, the lack of understanding on companies' strategic path and difficulties in managing continuous improvement were found to be a hindrance to implementing Kaizen. A study by Sim, Curatola & Banerjee (2015) surveyed 135 production employees of a manufacturing company in Eastern United States using a 7-point Likert scale questionnaire. The study confirmed that employee empowerment had a positive effect on employees' overall satisfaction and perceived job security.

In the Philippines, only a few studies have investigated on lean production. A study by Song-Kyoo Kim, (2015) investigated how Toyota implements Lean Manufacturing. Results of the study manifest that all improvements (Kaizen) during the Lean implementation should be directly intertwined onsite. Another study by Amaya and Carpena (2016) reveal that motion and transportation wastes were the most dominant waste in production due to poor implementation of method design and the short supply of equipment and tools. Consequently, cycle time was reduced which resulted to an increase in the net profit of the company.

So far, the cited studies showed conflicting results on the relationship between the implementation of lean manufacturing on production and employee satisfaction. Locally, the dearth of research have only provided insights on the effects of lean production on industries, but have not investigated the effect of lean production on employee satisfaction. This study aims to examine the effect of lean production perceived job satisfaction of workers in a plastic manufacturing company in Valenzuela City.

### **3. FRAMEWORK**

The study has adapted the framework by Rodriguez et al. (2015) to test the effect of perceived lean production on perceived job satisfaction of workers in plastics manufacturing. Figure 2 illustrates the four independent variables such as perceived continuous flow of products, perceived setup time reduction, perceived total productive maintenance and perceived employee involvement as measures of lean production. The dependent variable is perceived job satisfaction.

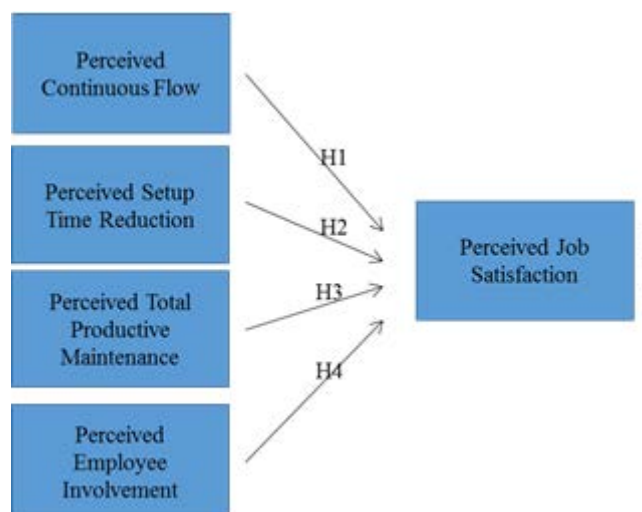


Figure 1. Research Framework

#### 4. HYPOTHESES

H<sub>1</sub>: Perceived continuous flow of products has a significant effect on perceived job satisfaction.

H<sub>2</sub>: Perceived setup time reduction has a significant effect on perceived job satisfaction.

H<sub>3</sub>: Perceived total productive maintenance has a significant effect on perceived job satisfaction.

H<sub>4</sub>: Perceived employee involvement has a significant effect on perceived job satisfaction.

#### 5. METHODOLOGY

The study is an explanatory research that analyzes the effect of lean production on job satisfaction of workers in a plastics manufacturing company. It used purposive sampling. A survey was conducted among 50 workers in Techron Industrial Corporation, a plastics manufacturing company located in Valenzuela City. Forty workers (80%) have responded to the survey.

A total of 16 items were adapted from Shah (2007) to capture the measures of lean production such as perceived continuous flow of products, perceived setup time reduction, perceived total productive maintenance and perceived employee involvement. Each question was measured by a five-point Likert scale that is to say: 1 = no implementation, 2 = little implementation, 3 = some implementation, 4 = extensive implementation and 5 = complete implementation. On the other hand, perceived job satisfaction adapted 10 items from Smith (2018). Each question was also measured by a five-point Likert scale: 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree and 5 = strongly agree.

Additionally, a survey instrument was adapted to test the hypotheses in this study. In order to ensure the content validity of the scale used, the items for each construct from prior researches were adapted from Handbook of Management Scales.

To test the effect of lean production on perceived job satisfaction, the study used multiple regression analysis. The formula for linear regression is

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

where:

$Y_i$  = perceived job satisfaction

$\beta_0$  = constant

$\beta_1 X_1$  = perceived continuous flow of products

$\beta_2 X_2$  = perceived setup time reduction

$\beta_3 X_3$  = perceived total productive maintenance

$\beta_4 X_4$  = perceived employee involvement

## 6. RESULTS AND DISCUSSION

### 6.1 Profile of the Respondents

The average age of respondents was 33.1 years ( $SD = 8.98$ ). Respondents were 19 men and 21 women aged 20 to 55 years (men:  $M = 30.3$ ,  $SD = 6.68$ ; women:  $M = 35.6$ ,  $SD = 10.2$ ).

The average monthly salary of respondents was Php 14,942. Respondents were 19 men and 21 women with average monthly salary from Php 13,000 to Php 25,000 (men:  $M = 15132$ ,  $SD = 2671$ ; women:  $M = 14771$ ,  $SD = 1468$ ).

There were 22 married and 18 single respondents.

### 6.2 Test of Multicollinearity

There is no multicollinearity between variables. Their variance inflation factor (VIF) scores are below 10. These are their VIF scores: FLOW = 3.36, SETUP = 3.80, TPM = 3.12, EMPINV = 2.24, gender = 1.48, age = 1.96, civil status = 1.49, income = 1.29.

### 6.3 Linear Regression Analysis

Table 1

Perceived job satisfaction as the dependent variable

	Model 1
Constant	1.41** (0.45)
Perceived Continuous Flow of Products (FLOW)	-0.12 (0.12)
Perceived Setup Time Reduction (SETUP)	0.17 (0.10)
Perceived Total Productive Maintenance (TPM)	0.34* (0.14)
Perceived Employee Involvement (EMPINV)	0.31* (0.12)

R-squared	0.63
Adjusted R-squared	0.59
No. of observations	40

A linear regression analysis was applied to test if perceived continuous flow of products, perceived setup time reduction, perceived total productive maintenance and perceived employee involvement significantly predicted perceived job satisfaction as shown in Model 1. The results of the regression indicated that the predictor explained 58.6% of the variance ( $R^2 = .63$ ,  $F(4, 35) = 14.8$ ,  $p < .001$ ). It was found that perceived total productive maintenance ( $B = .34$ ,  $p = .022$ ) and perceived employee involvement ( $B = .31$ ,  $p = .015$ ) significantly predict perceived job satisfaction.

#### 6.4 Discussion

The findings of the study showed that specific measures of lean production such as perceived total productive maintenance and perceived employee involvement positively affect the job satisfaction of workers. The findings are consistent with the study of Rodriguez et al. (2015), Uslu (2015), Santos et al. (2015) and Sim et al. (2015) that claimed significant effect on job satisfaction through the implementation of lean production. Plastic manufacturers should educate the workers about lean production and its benefits. Awareness with the lean production is an important key to a successful implementation of lean production.

A worker from Techtron Industrial Corporation commented that lean production translates to good products then afterward, translating to customer satisfaction. In return, it provides satisfaction to do his job. While four workers commented that lean production provides benefits to the workers.

### 7. CONCLUSION AND RECOMMENDATION

This study assessed the effect of lean production on perceived job satisfaction of workers in plastic manufacturing. As per the results, perceived total productive maintenance and perceived employee involvement positively affected the perceived job satisfaction of the workers. The results were also supported by prior studies.

Since lean production is not widely accepted by workers, it is important for the

manufacturers to educate their workers about its principles and benefits. However, manufacturers need to ensure the job security of the workers. The management should always consider the welfare of the workers to make the lean management implementation work.

This study could provide awareness to the workers in plastics manufacturing regarding the significance of their role, on how to thrive in lean production implementation. They would be aware of the positive effect of lean production on job satisfaction.

The study could also add to existing literatures about lean production and job satisfaction.

Further studies can be considered on other measurements of lean production, such as customer involvement and supplier feedback. A new study can be made with a larger sample size.

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