

## **CHAPTER 5**

### **DISCUSSION AND CONCLUSION**

#### **5.1 Introduction**

This chapter contains the summarizing the findings of data analysis in order to answer the three research objectives that have been set earlier in chapter 1. Besides that, this chapter also revealed about the implication of study. The limitations of this study are provided by this chapter, and will discuss the recommendation for future study to overcome the limitations. And the last one, this chapter also provided the conclusion about this study.

#### **5.2 Discussion of Key Findings**

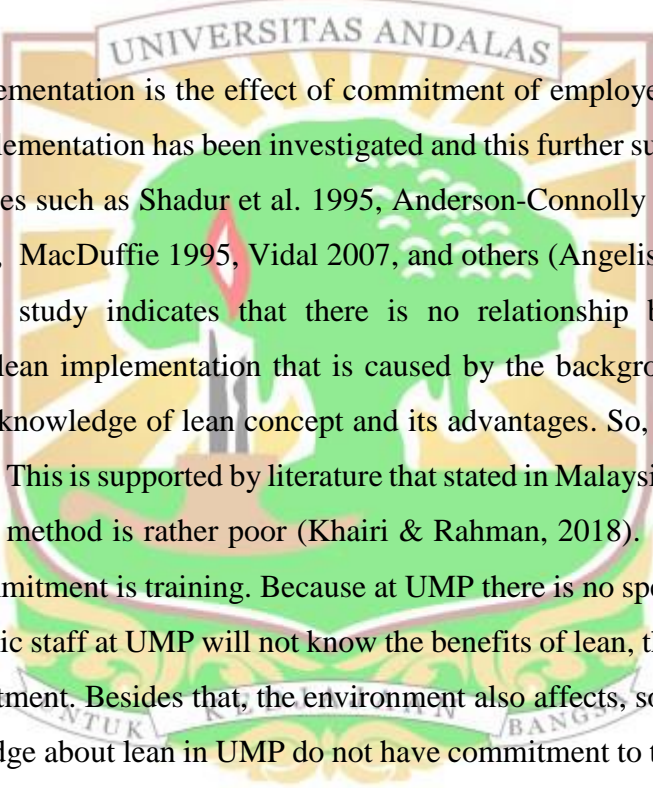
Based on hypothesis testing that has been done by bootstrapping on PLS, the results have been obtained whether the hypothesis was supported or not supported.

##### **5.2.1 Relationship of Employee Training on Lean Implementation**

Based on previous literature, there is no doubt for the effects of training on lean implementation have the strongest relationship, coincide with the results of much other studies such as Bonavia and Marin-Garcia 2011, Brown and Mitchell 1991, Forza 1996, Hiltrop 1992, Molleman and van den Beukel 2007, Power and Sohal 2000, and Sakakibara et al (Marin-Garcia & Bonavia, 2015). But the findings of this study claimed employee training not give a good view for lean implementation. In other words, the enablers of employee training not affect to lean implementation. It can be occurred because the existing training is not enough or lack of training (Gerger, 2016). It is supported based on article by TXM director (2019) revealed in some countries including

Australia, China, and South East Asia, training no gave significance result for lean implementation. It is caused by some of poor-quality training on offer. Hiring trainers capable of delivering a standardized lean course and testing the applicants against a predefined set of skills is quite easy and cheap. Sadly, trainer also lack the knowledge and leadership experience to mentor the trainees (TMX Director, 2019). No one literature and other sources revealed lean training in UMP. Training which is really a discuss about lean specifically in UMP can be said to be non-existent, but there is training about improvement quality. It strengthens training in UMP not affect to lean implementation.

### **5.2.2 Relationship of Employee Commitment on Lean Implementation**



Lean implementation is the effect of commitment of employee and the effect of specific work implementation has been investigated and this further supports the findings of other lean studies such as Shadur et al. 1995, Anderson-Connolly et al. 2002, Bhasin and Burcher 2006, MacDuffie 1995, Vidal 2007, and others (Angelis, Conti, Cooper, & Gill, 2011). This study indicates that there is no relationship between employee commitment and lean implementation that is caused by the background of respondent who have lack of knowledge of lean concept and its advantages. So, it is not growth up their commitment. This is supported by literature that stated in Malaysia university, actual awareness of lean method is rather poor (Khairi & Rahman, 2018). An important way that can grow commitment is training. Because at UMP there is no specific lean training, so that the academic staff at UMP will not know the benefits of lean, therefore it does not grow their commitment. Besides that, the environment also affects, some academic staff who have knowledge about lean in UMP do not have commitment to the implementation of lean, most likely they will not affect other staff who do not know about lean at all.

### **5.2.3 Relationship of Employee Understanding on Lean Implementation**

Without employee understanding and involvement, lean manufacturing will not be successful (West, n.d.). Balle (2018) and Taylor, Taylor, and McSweeney (2013) also stated there is a positive effect on employee understanding on lean implementation. But based on this study's findings states that there is no effect that caused by employee understanding on lean implementation. Because the majority of respondents' backgrounds are not from those who have related lean fields, so they do not have

knowledge how to implementing lean correctly. In strengthening, the lack of knowledge is one of the toughest challenges in lean implementation in university in Malaysia (Khairi & Rahman, 2018). An important way that can give knowledge about how to implement lean correctly is training, so because in UMP, training about lean specifically does not exist, therefore they do not have knowledges. The lack of knowledge caused there is no understanding that employee or academic staff UMP have.

#### **5.2.4 Relationship of Management Commitment on Lean Implementation**

It is widely accepted that commitment of management is most essential for the successful lean implementation (Alefari et al., 2017). Bevilacqua, Ciarapica, and De Sanctis (2017) and Mohamed (2016) also stated that there is a positive effect of management commitment on lean implementation. Opposite to this study's findings indicates that there is no relationship between management commitment and lean implementation. It caused by the background of respondent who have lack of knowledges of lean concept and its advantages. It same with employee commitment, caused by the majority of respondent backgrounds are not from those who have related lean fields and also no training about lean in UMP, so it does not grow up their commitment. This also supported by literature that revealed management failure to commit because there is no leadership involvement, no engaging employee (Turbide, 2013).

#### **5.2.5 Relationship of Management Understanding on Lean Implementation**

Contemporary research notes that a broad understanding needs to be ingrained in the organization, beginning with management or leadership, in order for lean to really have an impact (Pearce & Pons, 2017). Mohamed (2016) and Niewiadomski, Pawlak, and Tsimayeu (2018) stated there is a relationship between management understanding on lean implementation. But this study's findings stated that there is no effect caused by management understanding on lean implementation. It is due to not all management in UMP know about lean. So, they do not understand about lean entirely. Because they do not understand, it may not allow them to engaging their employee. Because management is a pillar, therefore if management failed as a factor for success lean implementation, therefore the employee also has high possibility to failed. It also supported by previous

study that stated the one of factor in failure lean implementation is lack of management understanding (Albliwi, Antony, Lim, & van der Wiele, 2014).

### **5.2.6 Relationship of Time for Improvement Work on Lean Implementation**

This study shows there is an effect of time improvement work on lean implementation. It is suitable with the previous literature that stated there is a positive effect of time for improvement work to lean implementation (Tohidi, 2012; Geoge, 2002). In UMP time for improvement which is a part of everyday work and for all employees, it is because lean improvement not only an event but also a mindset and implementation (Plainview LeanKit, 2019). Employee should do their work in teaching and other suitable with quality that has been build. If they do their work but not suitable with their work requirement, so they should make improvement by themselves at that time. It is also strengthened by a special time for doing improvement for evaluation and others such as meeting in UMP.

### **5.2.7 Relationship of Resources for Improvement Work on Lean Implementation**

Even though top management has a strong commitment, it is important to devote resources to improving job for any modifications (Malmbrandt & Ahlstrom, 2013). This study shows there is an effect of time improvement work on lean implementation. It suitable with the previous literature that stated there is a positive effect of time for improvement work to lean implementation (Tohidi, 2012; Geoge, 2002). In this study, the focus of resources for improvement is about investment. In UMP the investment as a resource not only comes from tuition paid by students, but also comes from the government of the Malaysia Kingdom. It suitable with the Arzani (2013) that stated as a sign of Malaysia's concern to education, the government give the largest national higher education development budget to education.

### **5.2.8 Relationship of Change Agent on Lean Implementation**

As supported by previous literatures, change agent is a crucial factor to spread the motivation for change throughout the organization (Nordin & Belal, 2017). In this study, the change agent as lean enabler gives an impact to lean implementation in UMP. It

suitable with most of previous study claimed that there is a positive effect between change agent and lean implementation. Effective change agent will be support to success lean implementation (Verble & Judy, 2019). Integrating change agent in lean implementation will achieved sustainability and support to lean (Nordin & Belal, 2017). In UMP change agent come from 2 source: internal and external. The internal change agent in UMP from internal such as academic staff from UMP who have a better understanding of lean implementation or related improvements. The external change agents are special experts who are not from the UMP circle to make better changes to lean implementation or related improvements it such workshop from other speaker and bring a consultant to UMP.

### **5.2.9 Relationship of Bi-directional Vertical Information Flow on Lean Implementation**

Previous literature that discussed about the relationship between bi-directional vertical information flow and lean implementation is very difficult to looking for. Dave, Kubler, Framling, & Koskela (2014) and Florest et.al. (2014) stated there is a relationship between information flow on lean implementation. Based on the findings of this study there is no relationship between bi-directional vertical information flow and lean implementation in UMP. Bi-directional vertical information flow can occur between academic staff in management positions such as dean, assistant dean, head of department/ program, and others with regular lecturers/ academic staff at UMP. But findings of this study stated there is no effect of employee and management on lean implementation. Therefore, it will have an impact on bi-directional vertical information flow. So that, bi-directional vertical information flow cannot support lean implementation.

### **5.3 Implication of Study**

The implication of this study including theoretical implication and practical implication.

### **5.3.1 Theoretical Implication**

The findings of this study can be used to add to body of knowledge. This study gives an addition to theory about the principle of implementing lean at university. This means increasing the empirical evidence reported in the literature about implementing lean in the university. This study also provides knowledge about improving university in Malaysia. According to Khairi and Rahman (2018), several academic papers have been reported in Malaysia to support the advantages of lean in the manufacturing and industrial sectors, but surprisingly less focus has been paid to the likelihood of achieving advantages if implementing lean in university. Other than, this study was theoretical development about relationship between lean enablers and lean implementation, the result about lean enabler give knowledge about how to do improvement. Most previous studies such as Mohamed (2016) who examined employee involvement, Alefari, Xu, and Salonitis (2017) only studied management leadership, they do not examine more broadly about other enabler lean. As with this study, it not only examines employees but also management and infrastructure elements.

Next, to provide direction and basic for future research in lean university and related topics. The related topic that could be develop by this research is like the lean enablers, the lean implementation, improvement university, and others. For example, there is literature review about lean enabler in construction project (Bayhan et al., 2019), but lack discussed about enabler lean implementation in university. In other words, this study can enrich the literature review on topics related to lean. Other than just only three of nine enablers (time for improvement work, resources for improvement work, and change agent) in this study are supported, so it can bi direction and basic for future study.

### **5.3.2 Managerial/ Practical Implication**

The findings of this study can be used by other university or service industry in Malaysia to improve their performance. First implication is to give suggestion to UMP on their effort to eliminate waste in their operation. The operations can create waste can occurred in teaching, research, administration, and management. This study can give insight to academic staff in universities or employees and all stakeholder in the company about activities or processes that involve into eight categories of waste.

Second, to give insight on how to implemented lean in university. In this study, the university can implement the lean related to several ways such as waste identification, work standardization, level and balance workloads, built in quality, pull system, multifunctional employees, and continuous improvement. If organization such university, other public service, and also manufacturing or industry know how to implement lean, it can bring many benefits to its organization.

The last one is to provide information about importance of enablers for lean adaption in university. This research provides consideration of the importance of enablers. Enabler lean implementation in this study consists of nine enablers that are employee training, employee commitment, employee understanding, management commitment, management understanding, time for improvement work, resources for improvement work, change agent, and bi-directional vertical information flow. The result of study indicates that there is no relationship between employee training, employee commitment, employee understanding, management commitment, management understanding, and bidirectional vertical information flow in UMP. Based in the previous literature, all enablers have a positive effect on lean implementation. But in this study just 3 enablers (time for improvement work, resources for improvement work, and change agent) have a positive effect on lean implementation. It can be a foundation for organizations (manufacturing, public service, and others) to move on to the next step and be a consideration in making decisions and strategies.

#### **5.4 Limitations of The Study**

Although this study has significance but this study is cannot separate from some limitation. The limitation included time of collecting data, education background, response of respondent, and research method.

##### **5.4.1 Time**

Data collection time is also be a limitation in this study. Researcher collect data within 3 weeks. At the time of spreading the questionnaire many respondents who could not fill it directly due to busy. Most of them asked to take it in one week. But after one

week, when I want to take back the questionnaire, there were still those who have not filled it and they asked for extra time to fill it and so on. Time limitation is also due to the data retrieval was in the day's liquidity of busy week for lecturers in midterm exam. This study is a cross-sectional study by only once (one-point time) collecting the data. Several studies indicated that lean manufacturing implementation requires long-term commitment and that sometimes the benefit of leaning cannot be realized in the short term.

#### **5.4.2 Background of Respondent**

Respondent's background being a striking limitation on this study. Lecturer from Faculty of Industrial Management (FIM) entirely know with the lean concept. But from the other faculty, several respondents who do not know about lean concept especially Faculty of Computing. Although the questionnaire is adapted from literature that can overcome that problem. Many respondents also curious about lean, so if they want to fill the questionnaire they should searching about lean and the researcher also explain about lean to them. Because of that, collected data need much time.

#### **5.4.3 Responses of Respondent**

Responses of respondent have been the limitation because difficult to get it. Initially, based on the initial research design of data collection techniques was to use online survey questionnaire using Google form. After a week that online survey questionnaire was sent to the 210 email of lecturer in UMP, but no one responded. So that, self-administered survey was added to the data collection technique. Response rate for this study which is 85.71% can be said that it is high. It obtained because, before gave questionnaire to them, the researcher asked for their availability to fill out the questionnaire. But during 3 weeks, only 140 respondents are available to fill the questionnaire.

#### **5.4.4 Research Method**

This study using quantitative method to achieve its objective by using questionnaire as an instrument to collect data. The quantitative research done by using



statistical tool to analysed data from questionnaire. Because only three enablers in this study is supported, it is difficult to justify why it is happened. The respondents can only give their perceptions according to what is in the questionnaire. They cannot reveal more broadly or researchers can no longer dig deeper for information such as in interviews.

## **5.5 Recommendation**

For future study can be applied a few of recommendation based on this study. First, time to collect data should be considered, is better if collect the data when the respondents have many leisure times. So that, the response of respondent is easy to collect. This research is a cross-sectional analysis by only once collecting the data. It is necessary to study the phenomena of lean performance impact in more than one point of time (longitudinal study). Next, for the questionnaire survey, is better to briefly revealed the summary of lean concept. It is due to respondents from different faculty and not all respondents well know about the lean concept. It can also remind back the respondent about lean concept, so they can give the expected answers. After that, for the sampling technique, there is no limitation about simple random sampling, but method is will betters to using stratified random sampling. With that, then the data will be more varied and data is taken evenly in each of the faculties. So, there are no more dominant faculties. Next, will be better to enlarge the sample. After that, the researcher can also use the mix method between the quantitative research and the qualitative research to produce a fuller study. So that the study is expected to produce more accurate results. The last recommendation for the future not only to assess lean implementation academic but also in other sector service.

## **5.6 Summary and Conclusion**

Therefore, the higher education is dealing with several uncertainties and claims as well as quality and performance problems. To prevent or reduce these problems and control their effects, lean management was introduced to the higher education sector in order to best manage academic processes. However, lean implementation is still a challenge for the most practitioners in the higher education in Malaysia. Hence, this study

present analyse of the impact of lean enablers on lean implementation in University Malaysia Pahang (UMP).

Researcher identified nine enablers for lean implementation as independent variable. Those are employee training, employee commitment, employee understanding, management commitment, management understanding, time for improvement work, resources for improvement work, change agent, and bi-directional information flow. Analysis results showed that three of nine enablers which are time for improvement work, resources for improvement work, and change agent are supported to impact lean implementation. Result of this study can be used by university especially UMP to evaluate their service. Generally, there is a misperception about enablers of lean implementation in lean university in UMP.

