UNIVERSITY-INDUSTRY COLLABORATION CHALLENGES IN CREATING VALUE FOR ECO-INNOVATION AMONG HIGHER LEARNING INSTITUTION RESEARCHER

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APPROVAL

I hereby acknowledge that I have read this works and in my opinion this works is appropriate in terms of scope and quality for the submission and award of a Bachelor Degree of Technology Management (High-Technology Marketing) with Honours.

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The thesis is submitted in partial fulfilment of the requirements for the award of Bachelor of Technology Management (High-Tech Marketing) with Honours

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DECLARATION

I hereby declare that this thesis with the title "University-Industry Collaboration Challenges In Creating Value For Eco-Innovation Among Higher Learning Institution Researcher" is my own work and has not been submitted to others.

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DEDICATION

Firstly, I would like to thank my family and supervisor for giving me the support and encouragement in order for me to complete the thesis report. Then, a special thanks to Universiti Teknikal Malaysia Melaka for giving me the chance to carry out and complete the research.

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ABSTRACT

Recently, people are getting more serious about the environmental problems that have harmful effect to people. An effective approach for sustainable development is essential and eco-innovation that aim to reduce the environmental impact caused by consumption and manufacturing activities has been implemented. Since the application of knowledge has assumed greater importance in creating eco-innovations, collaboration between university and the industry is perceived as a tool that make knowledge exchange easily. However, some potential challenges may exist and impede the collaboration. Hence, this study is to identify the university-industry collaboration challenges in creating value for eco-innovation among higher learning institution researcher in Melaka, Malaysia in order to serve as the guidelines when forming the collaboration. Orientation-related challenges, resource-related challenges and transaction-related challenges are the three challenges that are going to discuss in this study. A quantitative research was used to collect data from 150 respondents and analyse by using Statistical Package for Social Science (SPSS). The result from Pearson's Correlation and Multiple Regression analysis showed that transaction-related challenges was the most challenging factor when forming the collaboration with industry. As a result, this research can bring benefit to university, industry and government in order to find the best solution to minimizes the challenges to develop effective R&D collaboration in eco-innovation practice.

Keywords: eco-innovation, university-industry collaboration, challenges

ABSTRAK

Baru-baru ini, manusia semakin serius mengenai masalah alam sekitar yang memberi kesan buruk kepada orang ramai. Pendekatan yang berkesan untuk pembangunan mampan adalah penting dan eko-inovasi yang bertujuan untuk mengurangkan kesan alam sekitar yang disebabkan oleh aktiviti pengilangan telah dilaksanakan. Memandangkan penerapan pengetahuan adalah penting dalam mewujudkan eko-inovasi, kerjasama antara universiti dan industri dianggap sebagai alat yang memudahkan pertukaran pengetahuan. Walau bagaimanapun, beberapa cabaran mungkin wujud dan menghalang kerjasama. Oleh itu, kajian ini adalah untuk mengenal pasti cabaran kerjasama industri-universiti dalam mewujudkan nilai untuk eko-inovasi di kalangan penyelidik institusi pengajian tinggi di Melaka, Malaysia supaya menjadi garis panduan semasa membentuk kerjasama. Cabaran yang berkaitan dengan orientasi, cabaran berkaitan sumber dan cabaran yang berkaitan dengan transaksi adalah tiga cabaran yang akan dibincangkan dalam kajian ini. Kajian kuantitatif telah digunakan untuk mengumpul data daripada 150 responden dan menganalisis dengan menggunakan Statistical Package for Social Science (SPSS).. Hasil daripada analisis korelasi dan analisis regresi telah menunjukkan bahawa cabaran yang berkaitan dengan transaksi adalah faktor yang paling mencabar ketika membentuk kerjasama dengan industri. Hasilnya, penyelidikan ini dapat memberi manfaat kepada universiti, industri dan kerajaan untuk mencari penyelesaian terbaik untuk meminimumkan cabaran untuk membangunkan kerjasama R&D yang berkesan dalam amalan eko-inovasi.

Kata kunci: eko-inovasi, kerjasama industri universiti, cabaran

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LIST OF ABBREVIATIONS

UNESCO	United Nations Educational, Scientific and Cultural Organization
PH.D.	Doctor of Philosophy
M.D.	Doctor of Medicine
R&D	Research and Development
UTeM	Universiti Teknikal Malaysia Melaka
UiTM	Universiti Teknologi Mara
MMU	Multimedia University
SPSS	Statistical Package for Social Science

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.0   Introduction

Chapter 1 is about the outline of research that provide general view of background study, discussion of problem statement about university-industry collaboration and eco innovation, the research question and objectives, scope, limitation as well as importance of study.

1.1   Background of study

In recent years, peoples are more care about the global environment issues. Environmental issue can be defined as the activity done by human with damaging consequence on the environment. Some of the environmental issue's example are waste disposal, deforestation, acid rain, pollution, global warming, depletion of natural resources, loss of biodiversity and so on (Singh R. and Singh P., 2017). Conservation need to be done in order save the earth and in return people can achieve an improved quality of life because natural resources help to ensure that the economy is moving, which is crucial for development and long-term feasibility.

Scott (2018) claimed that there is no much time for human to save the world. Environmental issues have impact on everyone and every dimension. Therefore, it is

essential to find innovative and suitable approaches for sustainable development. By referring to Martin (2018) on The Star Online, replacing polluting technologies with environmentally friendly technologies is consider as one of the environment issues in Malaysia. In order to create value for industry, applying innovation in technologies must be done to benefit the public and the planet. In fact, many manufacturing companies have showing hard work towards sustainable manufacturing that focus on creating products through eco-friendly process that can minimize environmental impact. As a result, eco-innovation approach has been implemented.

Eco-innovation is the manufacture of a good, service, process of making, or business technique that is fresh and can result in minimizing of pollution and other negative environmental impacts (Kemp and Pearson, 2008). In general, eco-innovation or referring as environmental innovation is relates to innovations with the aim to reduce the environmental impact triggered by different types of manufacturing activities.

However, it is a test for industry to explore and pursue innovative ideas due to the uncertainty and potential risk that may occurred. Therefore, since the application of knowledge is importance in creating eco-innovations, collaboration between universities and the industry is gradually perceived as a tool to enhance innovation through knowledge exchange. University-industry collaboration has been recognized as the most successful relationship because the needs of industry can be well known, straight away contribute to economic expansion (Ndlovu, 2017). According to Abdul Hadi (2016) on New Straits Times Online, the greater number of academics as well as representatives of industry are come to an agreement where universities and industry should collaborate as emphasized in the Malaysia Education Blueprint 2015-2025 for higher education.

University-industry collaboration is the networks between university and industry for the purpose of contributing resources and sharing the advantages based on their contributions (Lambert, 2003). It is important to work with university because it gives access to valuable knowledge and a good chance of conducting high quality research which is vital for eco-innovations. According to Chad (2013), one of the keys to a successful industry is the capability to create new ideas which can simultaneously

keep the process, products and services fresh and this is the reason why university-industry collaboration is important. Despite there are some potential challenges occurred at the time of collaboration, it can still bring lots of benefits and value to the society for all.

Challenges is a job, responsibility, or condition that is hard because ones must use a lot of energy, skill and determination in order to be success (Cambridge Dictionary). According to Wallin et al. (2014), the key challenge existed in university–industry collaboration is to utilise the information, skills and practices that are currently inadequate for the industry. On the industry sides there is a need to realize how does university carried out the research, and for universities it is necessarily to know the environment of industry. Basically, in this research, there are three types of challenges that are going to be discussed which are orientation-related challenges, resource-related challenges and transaction-related challenges.

If the challenges to form collaboration between university and industry can be diminish, the relationships formed between university and industry are considered mutually beneficial. Hence, it is important to know the potential challenges in forming the collaboration between university and industry so that a win-win situation can be created. According to Ndlovu (2017), the relationship between the universities and industry are inter-reliant and this type of relationship should be fostered and maintained for the sake of both entities to grow continuously in their respective areas. Therefore, the goal of this research is to find out the potential challenges to form university-industry collaboration in creating value for eco-innovation.

1.2   Problem Statement

University and industry have been worked together for a long period of time. Nowadays, the collaboration between university and industry has been boosted mainly due to the continuously changing environments. In fact, a survey done by UNESCO Institute for Statistics (2014), showed that Malaysia has 20.7% of industry partnered with universities to develop new products and processes, which is higher than most of the high-income countries. There are so many successful examples of university-industry collaboration. For example, researchers at one of the private universities have collaborate with Malaysian industry partners to construct a cohesive management system which can produce zero-waste for the mills (Emma, 2018).

University and industry work side by side in order to achieve benefits together. From the university point of view, universities can gain benefits in the form of monetary (Patil, 2012) and academicians' results (Lee et al., 2010). On the other hand, Perkmann et al. (2011) suggest that industry can get the benefits such as utilizing the tools that are created by the university for the development of innovative technologies as well as seeking talent to fill vacancies. According to statistic, there are around 78% of scholars in Malaysia work for the universities whereas only 12.3% carried out the research job in different types of industry (Zulita, 2018). In actuality, not only the university can undergo the research and development process but involving the industry together can help to generate a better result.

However, recently, in Malaysia, the collaboration's level is still low in term of quantity (Hamisah Tapsir et al., 2010). The collaboration between universities and industries meet some formidable challenges (Boardman and Corley, 2008; Bruneel et al., 2010; Lee et al., 2010). This is mainly due to university and industry are driven by different goals, values, cultures, language, limitation of time and incentive scheme (Lind et al, 2013). The previous research emphasis on determining the issues that reduce the types of challenges in collaboration, such as the ones by Bruneel et al. (2010); Tartari et al. (2012). However, these researches were conducted outside Malaysia. There is lack of research regarding the topic of university-industry collaboration challenges in creating values for eco-innovation. Thus, researcher found the gap that is necessary to understand what challenges are they facing when

collaborating with other party. This is also significance especially in the eco-innovation practice because once university and industry can identify and overcome the challenges, they can develop a successful collaboration which can in turn make contribution to the society. Nonetheless, in this research, the researcher is going to explore the potential challenge exist when university and industry collaborate and the value creation in eco-innovation practice.

1.3   Research Questions

In this study, there are a few research questions that have been formulated based on the problem statement which are:

i.   What are the challenges for university to form collaboration networks with industry?

ii.   Which challenges will most influencing university to form collaboration networks with industry?

iii.   What is the relationship between challenges and university-industry collaboration?

1.4   Research Objectives

Basically, this research is to study about the challenges for industry to form collaboration with university towards creating value for eco-innovation. The objectives are:

i.   To identify the challenges of forming collaboration between university and industry toward the development of eco-innovation

ii.   To analyse the most challenging factors towards university and industry collaboration

iii.   To determine the relationship between challenges and university-industry collaboration

1.5   Scope of study

In this research, the researcher aims to identify the challenges to form university-industry collaboration toward the development of eco-innovation. However, the research will focus on the perception of high learning institution researchers in Melaka. Researcher is a person who carries out scientific or academic research. Researcher can be a university lecturer or faculty member that usually has Doctor of Philosophy (PH.D.) or Doctor of Medicine (M.D.) and spending their time in studying research papers of other scholar and prepare for manuscripts and grand proposals. Moreover, researcher can also be researcher scientists that often occupy their time in doing the research and shared resource specialist who shared the equipment with other scientists in the lab. Then the academic staff and technician who are doing the research or assist in the research process. Finally, the researchers may also include those who are taking postgraduate course in a university and doing their research study. Despite there are many types of researchers, this research will only focus on university researchers and postgraduate students. They have been selected as the respondent because they have the experience in doing research in university and can best represent university when forming the collaboration with industry.

1.6   Limitation of Study

Limitation is the condition where researcher has limited ability and cannot take full control. In Malaysia, there are three types of university which are public university, private university and university college. According to the List of Universities in Malaysia (2018), there are 20 public university and 34 university college in Malaysia. On the other hand, private university have the highest amount of 47. All the three types of university are located at 13 states of Malaysia, where 11 in peninsular Malaysia and

2 in Malaysian Borneo. However, this study will focus on university in the state of Melaka because Melaka is the earliest in paying green efforts to get control of the worldwide environmental disaster (Murali, 2017). For example, according to Ramesh (2018), in order to decrease carbon dioxide emissions, a more environmental-friendly street lamps are set.

The following limitation of this research was the small coverage of sample size and had only focus on researchers in Melaka state. Hence, the results cannot represent all the other state in Malaysia. A larger number of respondents who are represent the university and industry from different state in Malaysia should be considered in the future study in order to collect their perception of university-industry collaboration. Besides that, time constraint is another restraint for this research, where the researcher has limited time of around one year to complete the research from Chapter 1, Introduction to Chapter 5, Conclusion.

1.7   Importance of study

First, by doing this research, both university and industry can gain benefit. Since university and industry are seen as two different environments, analysing their different point of views are importance because by knowing the potential challenges and challenges to restrict collaboration among them, they can know how to prevent and reduces the obstacles. Mutual understanding among university and industry is crucial to form a long-term collaboration. In doing this research also, both university and industry can be motivated to form collaboration because of the advantage offered.

Second, this research will benefit the society indirectly because university-industry collaboration in terms of eco-innovation practice can contributes to sustainable development where the existing needs are performed while welfare of future generations can also be preserved. Sustainability can only be attained by having significant improvements on technology using eco-innovation practice and with the help of human. Hence, in this research, university and industry can know their role in achieving this goal.

1.8 Summary

To conclude, the researcher has explained the research background and problem statement which lead to the formulation of research questions and research objectives. Moreover, researcher has explained the scope of study and limitation of research. Finally, the researcher has explained the importance of this research to university, industry and also society. Based on this research foundations, researcher can proceed to the next chapter for discussing the literature review.