

READINESS AND INTENTION TOWARDS KNOWLEDGE SHARING AND
SUCCESSFUL COLLABORATION BETWEEN UNIVERSITY AND INDUSTRY

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READINESS AND INTENTION TOWARDS KNOWLEDGE SHARING AND
SUCCESSFUL COLLABORATION BETWEEN UNIVERSITY AND INDUSTRY

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DEDICATION

Dedicated to my Beloved Family

My Parents, My Two Brothers and Three Sisters

You are the ones who showed me and taught me the meaning of the genuine love.
Thank you for your support, inspiration, empowerment, and love, which made my
PhD journey a pleasant one.

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ABSTRACT

Knowledge sharing and collaboration between university and industry has become a crucial factor towards innovation and development of the economy. Despite an ongoing collaboration between university and industry, researchers argue that there are elements that impede this collaboration. Researchers have called to investigate this issue at micro level. Nevertheless, there is a lack of theoretical framework that has investigated this subject at the individual level and particularly from the readiness and behaviour perspective. Therefore, the aim of this research is to investigate the impact of readiness and intention on knowledge sharing and successful collaboration between university and industry from the university academicians' perspectives. This research was underpinned by integrating the Theory of Planned Behaviour (TPB), change readiness, and successful collaboration. A total of 230 academicians, who were engaged in collaboration with industry in Universiti Teknologi Malaysia, participated in the survey questionnaires. The data were analysed by using Partial Least Squares (PLS) based on Structural Equation Modelling (SEM). The results indicated that the TPB is a useful theory to explain academicians' knowledge sharing with industry. In addition, from the readiness perspective, the results revealed that the efficacy and management support positively influenced academicians' knowledge sharing with industry. Lastly, the results showed that academicians' knowledge sharing influenced successful collaboration. These findings enhance the understanding of knowledge sharing and collaboration between university and industry from the readiness and behaviour perspective at the micro level. This study also provides practical implication for decision makers from university, industry, government, who are massively investing money, time and other resources, for an effective knowledge sharing and collaboration between university and industry.

ABSTRAK

Perkongsian pengetahuan dan usaha sama antara universiti dan industri merupakan faktor penting bagi inovasi dan pembangunan ekonomi. Walaupun wujud usaha sama yang berterusan antara universiti dan industri, penyelidik berpendapat wujudnya unsur-unsur yang menghalang usaha sama ini. Penyelidik mencadangkan agar isu ini dikaji pada tahap mikro. Walau bagaimanapun, terdapat kekurangan kerangka teori yang telah mengkaji isu ini di peringkat individu, terutamanya dari perspektif kesediaan dan tingkah laku. Oleh itu, tujuan kajian ini adalah untuk mengkaji impak kesediaan dan tahap perkongsian pengetahuan dan usaha sama yang berjaya antara universiti dan pihak industri dari perspektif ahli akademik universiti. Kajian ini telah disokong oleh integrasi Teori Tingkah Laku Terancang (TPB), kesediaan untuk berubah, dan usaha sama berjaya. Sejumlah 230 ahli akademik yang terlibat dalam usaha sama bersama pihak industri di Universiti Teknologi Malaysia turut serta menjawab soal selidik kajian. Data dianalisis dengan menggunakan Kuasa Dua Terkecil Separa (PLS) berdasarkan Model Persamaan Struktur (SEM). Hasil dapatan menunjukkan bahawa TPB adalah teori yang berguna untuk menerangkan perkongsian pengetahuan para ahli akademik dengan pihak industri. Di samping itu, dari perspektif kesediaan, hasil dapatan menunjukkan bahawa keberkesanan dan sokongan pihak pengurusan memberi kesan positif terhadap perkongsian pengetahuan para ahli akademik dengan industri. Akhir sekali, hasil dapatan menunjukkan bahawa perkongsian pengetahuan ahli akademik mempengaruhi usaha sama berjaya. Dapatan kajian ini meningkatkan kefahaman mengenai perkongsian pengetahuan serta usaha sama antara pihak universiti dan industri dari segi kesediaan dan tingkah laku di peringkat mikro. Kajian ini juga memberi implikasi yang penting kepada pembuat keputusan dan universiti, industri, dan kerajaan, yang secara amnya telah membelanjakan wang, masa, serta sumber-sumber lain, untuk keberkesanan dan kecekapan perkongsian pengetahuan dan usaha sama yang berkesan antara universiti dan industri.

TABLE OF CONTENT

CHAPTER	TITLE	PAGE
	DECLARATION	iii
	DEDICATION	iv
	ACKNOWLEDGEMENT	v
	ABSTRACT	vi
	ABSTRAK	vi
	TABLE OF CONTENT	vii
	LIST OF TABLES	xiii
	LIST OF FIGURES	xv
	LIST OF ABBREVIATIONS	xvii
	LIST OF SYMBOLS	xviii
	LIST OF APPENDICES	xix
CHAPTER 1	INTRODUCTION	1
1.1	Introduction	1
1.2	Research Background	1
1.3	Problem Statement	5
1.4	Foundation for the Research and Research Aim	8
1.5	Research Objectives	8
1.6	Research Questions	9
1.7	Research Significance	10
1.8	Research Scope	10
1.9	Thesis Structure	12
1.10	Summary	13
CHAPTER 2	LITERATURE REVIEW	15
2.1	Introduction	15
2.2	The Concept of Knowledge	16

2.2.1	Knowledge	16
2.2.2	Knowledge Management	18
2.2.3	Overview of Knowledge Sharing	19
2.3	A Holistic View of Knowledge Sharing and Collaboration between University and Industry	21
2.3.1	Government's Support towards Collaboration between University and Industry	25
2.3.2	A Micro Perspective, What Motivates Academicians to Contribute with Knowledge to Industry?	27
2.3.3	Perceived Drawback by Academicians	29
2.4	Knowledge Sharing and Collaboration between University and Industry in Malaysia Context	30
2.4.1	Malaysian Government	32
2.4.2	Perceived Benefits of Collaboration by Malaysian Universities and Industries	35
2.4.3	Perceived Challenges of Collaboration by Malaysian Universities and Industries	36
2.5	The Individual Aspect	37
2.5.1	Readiness and Knowledge Sharing Behaviour in a General Context	40
2.5.2	Academicians Readiness to Share Knowledge with Industry	41
2.5.3	Academicians Readiness to Share Knowledge with Industry in Malaysia Context	42
2.5.3.1	The Research Gap	44
2.6	Model Development	45
2.6.1	Theoretical Orientation	46
2.6.2	Theory of Reasoned Action (TRA)	46
2.6.2.1	Theory of Planned Behaviour (TPB)	47
2.6.2.2	Justification for Selecting TRA and TPB	48
2.6.3	Proposed Model	50
2.6.3.1	Definition of Construct	51
2.6.4	Research Hypotheses	53
2.6.5	Readiness	53
2.6.5.1	Efficacy	54
2.6.5.2	Appropriateness	55
2.6.5.3	Personal Valence	55

2.6.5.4	Management Support	56
2.6.5.5	Attitude	57
2.6.5.6	Subjective Norms	58
2.6.5.7	Perceived Behaviour Control	59
2.6.5.8	Intention to Knowledge Sharing	60
2.6.5.9	Knowledge Sharing	61
2.6.6	Summarizing the Model Development and Hypothesis	62
2.7	Summary	63
CHAPTER 3	RESEARCH METHODOLOGY	65
3.1	Introduction	65
3.2	Philosophical Worldview	65
3.2.1	Ontology	66
3.2.2	Epistemology	67
3.3	Methodology	69
3.4	Research Methods	70
3.5	Research Design	72
3.5.1	Phase 1: Literature review	74
3.5.2	Phase 2: Targeting the Audience of the Study	75
3.5.2.1	Population	75
3.5.2.2	Sample Size	76
3.5.2.3	Sampling Strategy	79
3.5.3	Phase 3: The Survey Design	81
3.5.3.1	Face Validation	85
3.5.3.2	Content Validity	86
3.5.3.3	Pilot Testing	88
3.5.3.4	Pilot Testing Results	89
3.5.4	Phase 4: Data Analysis	90
3.5.5	Selecting Structural Equation Modeling (SEM)	91
3.5.6	Assessment of Measurement Model	94
3.5.6.1	Internal Consistency	95
3.5.6.2	Convergent Validity	95
3.5.6.3	Discriminant Validity	96
3.5.6.4	Summary of Measurement Model	97

3.5.7	Assessment of Structural Model	98
3.5.7.1	Collinearity Assessment	99
3.5.7.2	Path Coefficient β	100
3.5.7.3	Coefficient Determination (R^2)	100
3.5.7.4	Effect Size (f^2)	101
3.5.7.5	Predictive Relevance (Q^2)	101
3.5.7.6	Summary of Assessment of Structural Model	102
3.6	Phase 5: Ethical Consideration	103
3.7	Summary	104
CHAPTER 4	DATA ANALYSIS AND RESULTS	105
4.1	Introduction	105
4.2	Respondents Profile	105
4.3	Data Analysis	108
4.4	Assessment of the Measurement Model	108
4.4.1	Internal Consistency	109
4.4.2	Convergent Validity	110
4.4.2.1	Outer Loading	110
4.4.2.2	Average Variance Extracted (AVE)	111
4.4.3	Discriminant Validity	112
4.5	Assessment of the Structural Model	114
4.5.1	Collinearity Assessment	115
4.5.2	Explained Variance (R^2)	116
4.5.3	Path Coefficient (β)	117
4.5.4	Assessment of the Effect Size (f^2)	118
4.5.5	Assessment of Predictive Relevance (Q^2)	119
4.6	Hypotheses Testing	120
4.7	Summary	124
CHAPTER 5	FINDINGS AND DISCUSSION	125
5.1	Introduction	125
5.2	An Overview of the Findings and Discussion	125
5.3	Hypotheses Discussion	127

5.3.1	Hypothesis 1: Efficacy (EFF) is Positively Associated with Knowledge Sharing (KS)	128
5.3.2	Hypothesis 2: Appropriateness is Positively Associated with Knowledge Sharing (KS)	129
5.3.3	Hypothesis 3: Personal Valence (PV) is Positively Associated with Knowledge Sharing (KS)	130
5.3.4	Hypothesis 4: Management Support (MS) is Positively Associated with Knowledge Sharing (KS)	132
5.3.5	Hypothesis 5: Attitude (ATT) is Positively Associated with Intention to Knowledge Sharing (KS)	133
5.3.6	Hypothesis 6: Subjective Norm (SN) is positively associated with Intention to Knowledge Sharing (KS)	134
5.3.7	Hypothesis 7: Perceived Behaviour Control (PBC) is Positively Associated with Intention to Knowledge Sharing (KS)	135
5.3.8	Hypothesis 8: Intention (INT) to Knowledge Sharing is Positively Associated with Knowledge Sharing (KS)	136
5.3.9	Hypothesis 9: Knowledge Sharing (KS) is Positively Associated with Successful Collaboration (SC)	137
5.4	Final Model Discussion	138
5.5	Research Achievements	140
5.6	Research Contribution	142
5.6.1	Theoretical Contribution	142
5.6.2	Practical Contribution	144
5.6.2.1	Government Perspective	144
5.6.2.2	University Perspective	145
5.6.2.3	Industry Perspective	147
5.7	Limitation of the Research	148
5.8	Future Research Recommendations	148
5.9	Concluding Remarks	150

REFERENCES	151
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LIST OF TABLES

TABLE NO.	TITLE	PAGE
Table 2.1	Forms of university industry collaboration	24
Table 2.2	Motivation for university to collaborate with industry	28
Table 2.3	Definition of constructs in context of this study	52
Table 2.4	List of all the constructs of the model	62
Table 2.5	Summary of model development and correlations of variables	62
Table 3.1	Four different ontologies	67
Table 3.2	Implications of positivism and social constructionism	68
Table 3.3	Research methods used by previous researchers	71
Table 3.4	Phase 1 set of activities	74
Table 3.5	Summary of the survey instrument	83
Table 3.6	Expert profiles for content validity	87
Table 3.7	Pilot results	90
Table 3.8	Rules of thumb for choosing between CB-SEM and PLS-SEM	93
Table 3.9	Summary of criteria used to complete the measurement model	97
Table 3.10	Summary of criteria used to assess the structural model	102
Table 3.11	Ethical consideration of the research	103
Table 4.1	Respondents profiles of the survey	106
Table 4.2	Respondents engagement with industry	107
Table 4.3	Respondents type of engagement with industry	107
Table 4.4	Composite reliability and Cronbach's Alpha	110
Table 4.5	Outer loading and AVE	111

Table 4.6	Factor loading (cross loading)	113
Table 4.7	The results of Fornell- Larcker's criterion	114
Table 4.8	R ² values of the dependent variables	116
Table 4.9	Path coefficient β	118
Table 4.10	Effect size (f^2)	119
Table 4.11	Overall results of structural model	122
Table 5.1	Overall results of structural model	127

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
Figure 1.1	Malaysia Government Spending's in R&D of higher education institutions	3
Figure 1.2	Number of researchers in Malaysia	4
Figure 1.3	Thesis Structure	12
Figure 2.1	Conceptual progression from data to knowledge	17
Figure 2.2	An integrated KM Cycle	19
Figure 2.3	University industry collaboration in Europe	23
Figure 2.4	The average percentage of funds received by the Research University to finance innovations and research activities	33
Figure 2.5	The total amount of governments' funds received by the five Research Universities for year 2006 to 2011	34
Figure 2.7	Theory of reasoned action (TRA)	46
Figure 2.8	Theory of planned behaviour (TPB)	48
Figure 2.9	Proposed model and hypotheses	50
Figure 3.1	Ontology, epistemology, methodology and methods and techniques	66
Figure 3.2	Research design and five phases	73
Figure 3.3	UTM Engagement with Industry	76
Figure 3.4	Table for Determining Sample Size (Krejcie & Morgan, 1970)	77
Figure 3.5	Sample size calculation based on G* Power	79
Figure 3.6	Sample of Structural Equation Model	92
Figure 3.7	Structural model assessment steps	99
Figure 4.1	The measurement models	109
Figure 4.2	First set coefficients	115

Figure 4.3	Second set coefficients	115
Figure 4.4	Predictive relevance Q^2	119
Figure 4.5	Structural model results	121
Figure 5.1	Final model of the study	139

LIST OF ABBREVIATIONS

APP	-	Appropriateness
ATT	-	Attitude
AVE	-	Average Variance Extracted
CB	-	Covariance-Based
CR	-	Composite Reliability
EFF	-	Efficacy
INT	-	Intention
KM	-	Knowledge Management
KS	-	Knowledge Sharing
LV	-	Latent Variable
MS	-	Management Support
OL	-	Outer Loading
PBC	-	Perceived Behavior Control
PLS	-	Partial Least Squares
PV	-	Personal Valence
SC	-	Successful Collaboration
SEM	-	Structural Equation Modeling
SN	-	Subjective Norms
SPSS	-	Statistical Package for the Social Sciences
TPB	-	Theory of Planned Behavior
TRA	-	Theory of Reasoned Actions
UTM	-	University Teknologi Malaysia
VIF	-	Variance Inflation Factor

LIST OF SYMBOLS

α	-	Cronbach's alpha
β	-	Beta
f^2	-	Effect Size
Q^2	-	Predictive Relevance
R^2	-	Coefficient Determination
G*power	-	Determining the sample size

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
Appendix A	Instrument Cover Letter	175
Appendix B	Instrument Survey	176
Appendix C	Content Validity Form	182
Appendix D	Expert's Acceptance for Instrument Validation	193

CHAPTER 1

INTRODUCTION

1.1 Introduction

The purpose of this research is to investigate the knowledge sharing and collaboration between university and industry from the perspective of academicians at the individual level. This chapter provides information regarding the background of the research, whereby some important historical as well as current facts are provided. The chapter discusses the problem statement which is based on previous and current research done by other researchers, and then the chapter presents the gap that this research has identified and will address further. The chapter also discusses the aim of the research which is followed by the research objectives. In this chapter the research questions are formulated along with the research hypothesis. Lastly, the chapter highlights the significance of this research and the scope of this research, then a summary of the chapter is provided.

1.2 Research Background

Scientists and researchers agree that knowledge is one of the most important asset of any organization, thus in order for companies to survive in the industry and to remain competitive, companies must ensure that they manage the knowledge in the most effective way (Dalkir, 2011; Uriartre, 2008). University has always been known as an institution that its core aim is to educate people and to provide with knowledge. However, in the recent years this expectation has gone beyond this traditional way, whereby universities are also expected to directly assist industries with knowledge and innovation. Although university and industry are two different and separate entities, the collaboration between the two has a long history, and researchers assert that the need for each other is increasing drastically. Specifically in

the era of knowledge economy, the need for university and industry to collaborate and share knowledge derives from the sense that this collaboration can be a fundamental cause of innovation, which will benefit both sides (Ankrah and AL-Tabbaa, 2015; Bukhari *et al.*, 2015; Caro *et al.*, 2017; Lai, 2011). Therefore, industries are increasingly looking at universities as the source of knowledge so that they can innovate and gain competitive advantage, and at the same time, universities are also aware of importance of collaboration with industries, because such collaboration can lead to gaining funds through the commercialization of their knowledge. Although commercializing the knowledge is important for universities to further gain funds, according to Bozeman *et al.* (2013) and Perkmann (2011), university academicians do also engage with industry to develop their research, rather than just commercializing it. These claims are rational, as the university academicians have a tendency to exercise their research expertise and at the same time to implement their theoretical knowledge into practical.

It is important to highlight that the government plays an important role in facilitating the collaboration between university and industry. For instance, the Malaysian government has implemented policies since 1990s to motivate research and development collaboration between universities and industry. In addition, to further enhance collaboration, the Malaysian government has taken few initiatives such as knowledge transfer program (KTP) that has been introduced in 2011. Programs of this nature have been also implemented elsewhere, such the case of UK where KTP program was introduced. Besides that, governments are taking initiatives to foster the collaboration between university and industry, infect them also fund them. For instance universities in Europe have been receiving massive funds to further enhance the collaboration (de Dominicis, Pérez and Zubieta, 2011).

Malaysia is going through a rapid transition from a developing nation to a developed nation, which is a mission set by the Malaysian government and to be achieved by 2020. Therefore, Malaysian government has understood the importance of the university and industry collaboration to attain this mission. In fact Malaysian government is increasingly funding research universities (Amran *et al.*, 2014; Mohd *et al.*, 2014). These funding were primarily to encourage Malaysian universities to be

more creative, innovative and commercialize their knowledge. According to Chandran *et al.* (2014), Malaysia government spending on Research and Development has increased massively since the year 2000 to 2012, which in numbers would be 10.6 billion Malaysian Ringgit per annum. Furthermore, the evidence showed that in the 11th Malaysia plan (2015) the government has focused on strengthening the collaboration between business enterprises, academia and government, with the core purpose to increase the innovation and translating it to wealth and boost the economy. Therefore, throughout the 2008 to 2015 the Malaysian government has been the major contributor to fund the research and development (R&D) of higher education institution (Science., 2016). The Figure 1.1 shows data from national survey of Ministry of Science, Technology and Innovation Malaysia, whereby it evident that over the years the Malaysia government is the main source of funding for universities.

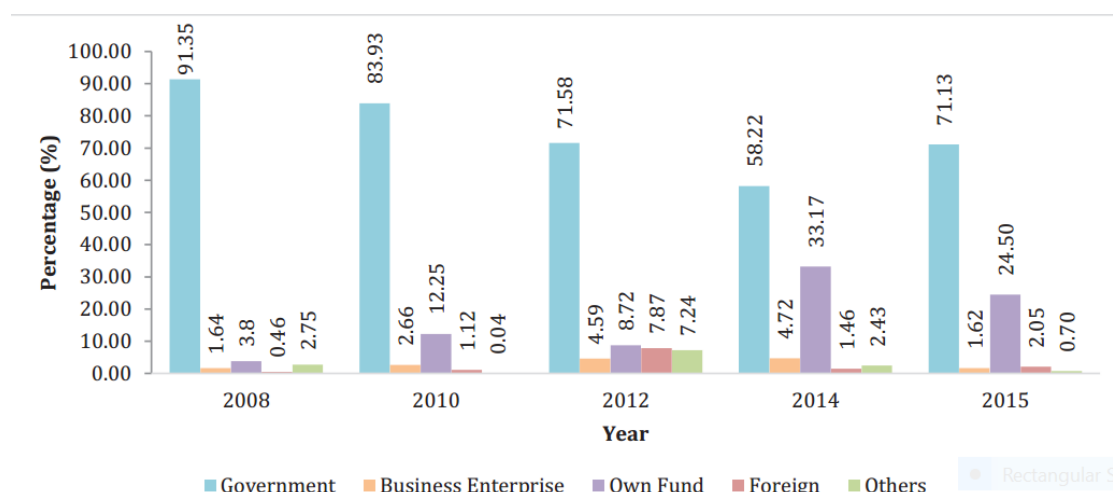


Figure 1.1 Malaysia Government Spending's in R&D of higher education institutions

Since the government has done massive investments, the same report proved that the number of researchers in higher education institution has also increased as shown in Figure 1.2.

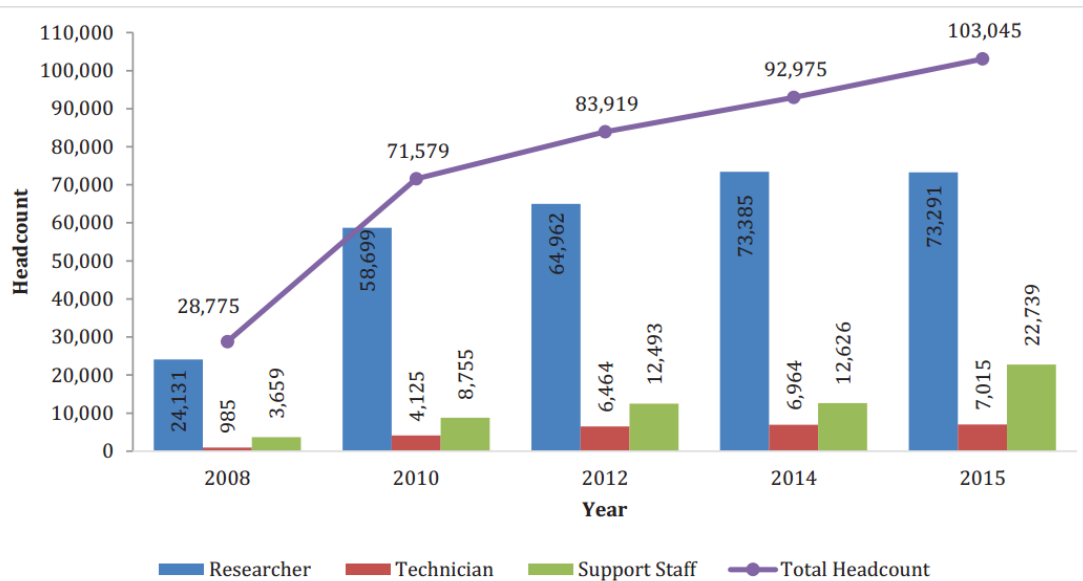


Figure 1.2 Number of researchers in Malaysia

As shown in Figure 1.1 the total government spending for R&D activities has increased over the years, nevertheless; due to economic crises and drop of GDP by 6% in 2014, the government spending for R&D has also been reflected with less investments in 2015. Despite this drop of government spending in 2015, Malaysia government is still actively taking initiatives under Malaysia Education Blueprint 2015–2025 (higher education) to further strengthen the collaboration between university and industry. However, the recent studies by Sew *et al.* (2018) have highlighted that Malaysian government is expecting from universities to generate the revenue on its own, to be more creative, innovative and to commercialize the knowledge, similar to the case of the USA and Canada where universities generate over \$1 billion from the engagement with industry. The same argument is made by Nur *et al.* (2017) who asserts that Malaysian research universities fall behind regarding the commercializing the knowledge to industry. Therefore, based on evidence it can be seen that currently the universities in Malaysia are not commercializing the knowledge at the degree they should, which has pushed the Government to spend more, but in the future there is higher expectations from the universities to be more innovative and help the economy of the country.

Knowledge sharing and collaboration between university and industry has taken a high interest and has always been in discussion by scholars, particularly due

to the different barriers that are impeding the collaboration. In addition, irrespective of the needs and benefits from having a mutual collaboration between university and industry, scholars argue that there is a big gap between university and industry (Normah, 2011; Othman *et al.*, 2012). According to Abeda *et al.* (2017), constraints between university industries are negatively influencing the success of national innovation of Malaysia. In fact the same author argues that Malaysian innovation performance has a significant gap with those high income countries.

It can be seen and it is quite evident that the collaboration between the university and industry in Malaysia is important, not only for university and industry but for the whole nation, but the scholars allude that the collaboration is having some challenges. The following subsequent section will elaborate in more detail some of the challenges between university and industry collaboration, what has been done by previous researchers to establish a better collaboration, and finally what is the current identified problem that needs to be further be investigated.

1.3 Problem Statement

The literature review has enlightened that knowledge sharing and collaboration between university and industry is of paramount importance. It has been identified that three main stakeholders such as university, industry, and the government are in need of this collaboration. However, scholars argue that knowledge sharing between university and industry is not a straightforward process as there are different factors that have been identified as barriers and which have formed a gap between them. According to Gertner, Roberts and Charles (2011), transferring and sharing knowledge from university to industry is possible, but it is a very difficult task, as it is very much dependent on communication between individuals. In addition, there is uncertainty of industry to spend money in acquiring knowledge by university, with the belief that academicians do not understand clearly the problems being encountered by the industry (Othman *et al.*, 2012; Veera *et al.*, 2013). Similar to the above mentioned arguments, other scholars also argue that despite the massive efforts taken to establish a better connection between university

and industry, there are still issues that hinder the communication between the two (Normah, 2011). Moreover, Ramli *et al.* (2013) asserts that Malaysian research universities are still in an unclear stage, and this is mainly as (R&D) are not providing impressive outcome or useful invention that will attract industries. This is quite concerning as the data from the World Bank's knowledge Economy Index that is meant to measure the ability to generate and diffuse knowledge, has ranked Malaysia 48th out of 145 countries (Abeda, Khan, Bashir and Senin, 2017). Based on these data, Malaysia universities are not in a very good position to provide with ideas and innovations to Malaysian industries. In addition, Munshi *et al.* (2017) states that despite the fact that over 20,000 scientific and technical journals being published, these publications and industry productions have weak linkage. This indicates that, industries in Malaysia are not benefiting too much from the knowledge being produced by academicians, therefore; in overall the industries contribution with funding in Malaysian universities is quite low (Amran *et al.*, 2014). This is quite concerning as research universities depend mainly on government spending, and they are not getting big investment by industries due to inability to address industry needs.

A study done in Malaysia by Abeda *et al.* (2015), found that there are constraints that impede the successful collaboration, and among major constraints is the communication, whereby university cannot communicate properly with industry, therefore, it cannot provide consulting, training or other services, which would help the industry with the innovation. In fact Woei *et al.* (2016) found that commercialization achievement in Malaysia is less than satisfactory, and for collaboration to be enhanced, the researcher's competence is a very important element to be considered (Sew *et al.*, 2018). Apparently, the findings from above mentioned authors are highlighting that academicians in Malaysia are not fully able to diffuse their knowledge with industry.

It is important to mention issues that impede the collaboration between university and industry, which fall at individual level (Ankrah *et al.*, 2013; Foss, 2011; Sarpong *et al.*, 2015). These arguments are supported by other scholars of knowledge management field, who emphasize that individuals are the main actors of knowledge sharing (Liebowitz, 2012; Pasher *et al.*, 2011). In fact, at the micro level,

Albats, Fiegenbaum and Cunningham (2017) highlights that success of university industry collaboration could be impacted due individuals having different goals, different expectation and lack of resources. Therefore, emphasizing on the importance of addressing this issue at the individual level from academic perspective, the recent literature has investigated academics motivation and other characteristics to bridge the gap (Ankrah *et al.*, 2013; Bozeman *et al.*, 2013; Perkmann, 2011; Huang *et al.*, 2017; Sarpong *et al.*, 2015). Although, the great work by other researchers in investigating the academician's motivation factors and individual characteristics such as experience, gender has helped to shrink the gap, but still industry practitioners are reluctant on academician's capability to help the industry (Filippetti *et al.*, 2017; Subramonian *et al.*, 2016; Sew *et al.*, 2018).

This research highly acknowledges the contribution of former researchers in attempting to foster a better knowledge sharing and collaboration between university and industry at micro level from the individual perspective. Based on the above mentioned arguments former researchers have called to investigate the knowledge sharing between university and industry at micro level or individual level, and their contribution in identifying some barriers and motivational factors in a specific context is vastly acknowledged. However, this research argues that to better understand individuals from academician's perspective it is not sufficient to only investigate individual's motivation, experience, gender and few individual characteristics, as human behaviours are more complex, hence, the phenomenon should be investigated from more perspectives. Therefore, this research will extend the literature by investigating and assessing the readiness of university academicians with regard to knowledge sharing and collaboration with industry practitioners. Although it is evident that individual's ability to collaborate is crucial, but it has not been clearly investigated by past researchers, and explicitly how academician's readiness impacts their knowledge sharing behaviour.

In addition, this research will also investigate drivers of academician's intention to share knowledge, such as attitude, subjective norms and perceived behaviour control, which are regarded as influencers of behavioural intention (Razak *et al.*, 2014; Rusly *et al.*, 2014). And lastly, this research will also measure the

correlation of academician's knowledge sharing with successful collaboration. The above-mentioned issues are of high importance; thus, this research will attempt to investigate them further.

1.4 Foundation for the Research and Research Aim

Researcher's interest in understanding knowledge sharing between university and industry originates from the passion on the subject of knowledge management and particular its main component knowledge sharing. Researcher's experience in the industry, at the same time studying in the university and being engaged in academic activities has enlightened the understanding of the importance of collaboration between the university and the industry in knowledge sharing. Different researchers assert that the collaboration between university and industry fosters a knowledge economy, where everyone benefits from it, be it people, society, university, industry, governments and so on.

The aim of this research is to investigate knowledge sharing and collaboration between university and industry from the perspective of individuals and explicitly from the academician's perspective. Thus, this research aims to get more insights on individual's readiness and behaviours with regard to knowledge sharing and collaboration, and by doing so, it is expects to find a better way to foster the knowledge sharing and collaboration between university and industry. Therefore, In order to achieve this aim, the following section presents the research objective.

1.5 Research Objectives

The objective of this research is as follows.

1. To assess the effect of academician's readiness on their knowledge sharing with industry.

2. To measure the influence of academician's attitude, subjective norms, perceived behaviour control on their intention to share knowledge with industry.
3. To investigate the effect of academician's intention to share knowledge on their knowledge sharing with industry.
4. To investigate the effect of academician's knowledge sharing on successful collaboration.

1.6 Research Questions

For objectives presented in the previous section, the corresponding research questions are formulated as follows:

1. What is the effect of academician's readiness on their knowledge sharing with industry?
2. What is the influence of academician's attitude, subjective norms, perceived behaviour control towards intention to knowledge sharing with industry?
3. What is the effect of academician's intention to share knowledge on their knowledge sharing with industry?
4. What is the relationship between academician's knowledge sharing and successful collaboration?

To give assumptions on the formulated research questions, next section introduces a set of hypotheses as follows.

1.7 Research Significance

This study contributes to further improve the knowledge sharing and collaboration between university and industry, specifically in Malaysian context. Evidence showed that the collaboration between the university and industry is having issues, which is why researchers are massively investigating this phenomenon. Since the recent literature has investigated and called to further investigate this phenomenon at micro level or individual level, therefore, this research is carrying this study from new perspectives, by simultaneously investigating knowledge sharing and collaboration between university and industry from the academician's perspective and considering the important dimensions of readiness, intention, knowledge sharing and successful collaboration. These dimensions have not been studied together in the past.

This study have theoretical contribution, whereby the Theory of Planned Behaviour (TPB), along with Readiness and Successful collaboration complement each other to address the problem statement, attain research objectives, which is not possible to be addressed by a single theory on its own. In addition, this research will also have practical implications, whereby university, industry and government that are struggling to find a better way of collaboration, will be able to gain some insights on how to get more knowledge being shared from university to industry, and eventually help oneself as well as the entire country. Last, but not least, this study contributes to the body of knowledge, specifically Knowledge Management and Change Management, which are two different fields that together will address the phenomenon of this study. Nevertheless, a more detailed explanation on research contribution will be presented in the Chapter 5, whereby the contribution will be elaborated in more details based on results and findings of the study.

1.8 Research Scope

The scope of this study is limited to readiness, intention to share knowledge, knowledge sharing and collaboration between university-industry from the individual

perspective, particularly academician's perspective. Secondly, this research does not investigate the technical aspect of the knowledge sharing between university and industry, but rather it investigates individual's behavioural aspects. Lastly, this research focuses on, readiness, intention, and behaviours of academicians from the university in Malaysia context. Specifically University Teknologi Malaysia (UTM) is the case study of this research where the data is being collected, and the respondents of the study are the UTM academicians who are engaged in collaboration with industry practitioners. The reason for choosing UTM as a case study is because UTM is among five research universities in Malaysia, and is massively engaged into collaboration activities with industry. In fact UTM as a research university is leading in collaboration with industry in the field of science and technology Cheng *et al.* (2013), and it is offering expertise to industry through research, commercialization, consultancy, training and industrial attachment, resource sharing and knowledge transfer (Nur *et al.*, 2015). In 2016 UTM was awarded by Malaysia Ministry of Higher Education as "Best Academia- Industry Collaboration" (Arham, 2016). A more detail explanation on why UTM is selected as case study of this research will be explained in chapter 3, under section targeting audience of the study and population.

1.9 Thesis Structure

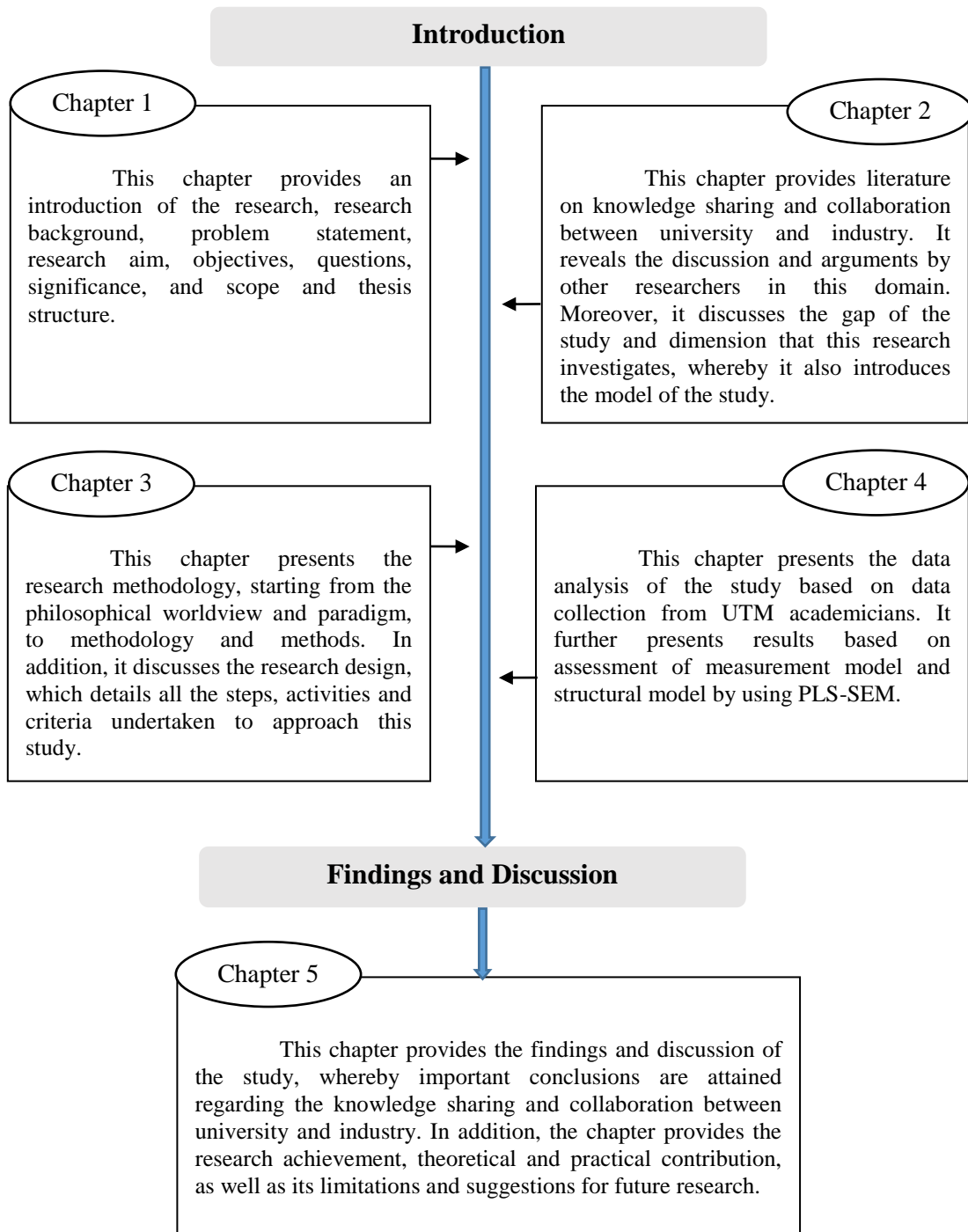


Figure 1.3 Thesis Structure

1.10 Summary

Chapter 1 presented a brief holistic overview of knowledge sharing and collaboration between university and industry. Subsequently the chapter highlighted the problem statement that has been identified through the literature review, along with the gap that this study will further investigate. This chapter also revealed the research aim and the research objective. In addition, a number of research questions were established and followed by assumptions or hypothesis. The chapter also emphasized on importance of this study, its contribution to the body of knowledge as well as its practical implication. Lastly, the scope of the study was presented.

REFERENCES

- Abdul Hamid, J., & Sulaiman, S. (2013). Relationship between perceived costs, perceived benefits and knowledge sharing behaviour among lecturers in educational institution in Malaysia. *Pertanika Journal of Social Science and Humanities*, 21(3), 937–951.
- Abiola, M., Mr, A.-R., & Opesade, A. O. (2015). Knowledge Sharing Behaviour of Academics in The Polytechnic Ibadan, 77(4), 40–55.
- Abreu, M., & Grinevich, V. (2017). Gender patterns in academic entrepreneurship. *Journal of Technology Transfer*, 42(4), 763–794.
- Aisah, S., & Sahlan, B. (2014). Commercialization Behavior Among Academicians : PERSONAL , Environmental And Entrepreneurial Self-Efficacy. *Australian Journal of Business and Economic Studies*, Volume 1.
- Ajzen, I. (1991a). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Albats, E., Fiegenbaum, I., & Cunningham, J. A. (2017). A micro level study of university industry collaborative lifecycle key performance indicators. *The Journal of Technology Transfer*.
- Amin, A., Hassan, M. F., Ariffin, M. B. M., & Rehman, M. (2011). Knowledge Sharing: Two-Dimensional Motivation Perspective and the Role of Demographic Variables. *Journal of Information & Knowledge Management*, 10(2), 135–149.
- Amran, F. H., Rahman, I. K. A., Salleh, K., Ahmad, S. N. S., & Haron, N. H. (2014). Funding Trends of Research Universities in Malaysia. *Procedia - Social and Behavioral Sciences*, 164(August), 126–134.
- Ankrah, S., & AL-Tabbaa, O. (2015). Universities-industry collaboration: A systematic review. *Scandinavian Journal of Management*, 31(3), 387–408.
- Ankrah, S. N., Burgess, T. F., Grimshaw, P., & Shaw, N. E. (2013). Asking both university and industry actors about their engagement in knowledge transfer: What single-group studies of motives omit. *Technovation*, 33(2–3), 50–65.
- Armenakis, A. A., & Bedeian, A. G. (1999). Organizational Change : A Review of Theory and Research in the 1990s. *Journal of Management*, 25(3), 293–315.

- Armenakis, A. a., & Harris, S. G. (2009). Reflections: our Journey in Organizational Change Research and Practice. *Journal of Change Management*, 9(2), 127–142.
- Armenakis, A. A., Harris, S. G., & Feild, H. S. (2000). Making change permanent A model for institutionalizing change interventions. *Research in Organizational Change and Development (Research in Organizational Change and Development, Volume 12) Emerald Group Publishing Limited*, (pp. 97–128).
- Armenakis, A. A., Harris, S. G., & Mossholder, K. W. (1993a). Creating Readiness for Organizational Change. *Human Relations*, 46(6), 681–703.
- Audretsch, D. B. (2014). From the entrepreneurial university to the university for the entrepreneurial society. *Journal of Technology Transfer*, 39(3), 313–321.
- Audretsch, D. B., & Lehmann, E. E. (2016). Industrial policy in Italy and Germany: yet another look. *Economia e Politica Industriale*, 43(3), 291–304.
- Audretsch, D. B., Lehmann, E. E., & Paleari, S. (2015). Academic policy and entrepreneurship: a European perspective. *Journal of Technology Transfer*, 40(3),
- Azagra-Caro, J. M., Barberá-Tomás, D., Edwards-Schachter, M., & Tur, E. M. (2017). Dynamic interactions between university-industry knowledge transfer channels: A case study of the most highly cited academic patent. *Research Policy*, 46(2), 463–474.
- Azagra. (2015). New Forms of University-Industry Collaboration in Finland : Key results of the National Survey Introduction : new perspective on the use of intangible assets, (2).
- Aziz, Z. A., & Bahar, A. (2016). The current scenario of industrial mathematics in Malaysia The Current Scenario of Industrial Mathematics in Malaysia, 020001.
- Azlina, W., Ab, W., Ghani, K., Rusli, I. F., Radiah, D., Biak, A., & Idris, A. (2013). An application of the theory of planned behaviour to study the influencing factors of participation in source separation of food waste. *Waste Management*, 33(5), 1276–81.
- Bagger, J., & Li, A. (2014). How Does Supervisory Family Support Influence Employees' Attitudes and Behaviors? A Social Exchange Perspective. *Journal of Management*, 40(4), 1123–1150.
- Banal-Estañol, A., Jofre-Bonet, M., & Lawson, C. (2015). The double-edged sword of industry collaboration: Evidence from engineering academics in the UK. *Research Policy*, 44(6), 1160–1175.

- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147.
- Barclay, D., Higgins, C., & Thompson, R. (1995). {The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration}. *Technology Studies*, 2(2), 285–309.
- Bjerregaard, T. (2010). Industry and academia in convergence: Micro-institutional dimensions of R&D collaboration. *Technovation*, 30(2), 100–108.
- Boardman, P. C., & Ponomariov, B. L. (2009). Erratum to “University researchers working with private companies”. *Technovation*, 29(8), 574.
- Bodas Freitas, I. M., Marques, R. A., & Silva, E. M. D. P. E. (2013). University-industry collaboration and innovation in emergent and mature industries in new industrialized countries. *Research Policy*, 42(2), 443–453.
- Bozeman, B., Fay, D., & Slade, C. P. (2013). *Research collaboration in universities and academic entrepreneurship: The-state-of-the-art*. *Journal of Technology Transfer* (Vol. 38).
- Brown, T. (2010a). Construct validity: A unitary concept for occupational therapy assessment and measurement. *Hong Kong Journal of Occupational Therapy*, 20(1), 30–42.
- Bruneel, J., D’Este, P., & Salter, A. (2010). Investigating the factors that diminish the barriers to university-industry collaboration. *Research Policy*, 39, 858–868.
- Bryman, A. (2007). Barriers to Integrating Quantitative and Qualitative Research. *Journal of Mixed Methods Research*, 1(1), 8–22.
- Bstieler, L., Hemmert, M., & Barczak, G. (2015). Trust Formation in University–Industry Collaborations in the U.S. Biotechnology Industry: IP Policies, Shared Governance, and Champions. *J PROD INNOV MANAG*, 32(1), 111–121.
- Buganza, T., Colombo, G., & Landoni, P. (2014). Small and medium enterprises’ collaborations with universities for new product development: An analysis of the different phases. *Journal of Small Business and Enterprise Development*, 21, 69–86.
- Bukhari, M. Z., Abdullah (2015). Empowering The Collaboration Of Industry And Academia Through Industry Centre Of Excellence (Icoe) Industry Centre Of Excellence (Icoe), 12(1), 18–22.

- Chandran, V. G. R., Hayter, C. S., & Strong, D. R. (2014). Economics of Innovation and New Technology Personal strategic alliances : enhancing the scientific and technological contributions of university faculty in Malaysia. *Routledge*, 37–41.
- Chatzoglou, P. D., & Vraimaki, E. (2009). Knowledge-sharing behaviour of bank employees in Greece. *Business Process Management Journal*, 15(2), 245–266.
- Chau, V. S., Gilman, M., & Serbanica, C. (2017). Aligning university–industry interactions: The role of boundary spanning in intellectual capital transfer. *Technological Forecasting and Social Change*, 123, 199–209.
- Chay, Yue Wah, Thomas Menkhoff, Benjamin Loh, and Hans-Dieter Evers. 2010. What makes knowledge sharing in organizations tick?—an empirical study. In *Governing and managing knowledge in Asia*, eds. Thomas Menkhoff, Hans-Dieter Evers, and Yue Wah Chay, 91–110. Singapore, NJ, London: World Scientific Publishing
- Cheng, H., Zhang, Z., Huang, Q., & Liao, Z. (2018). The effect of university – industry collaboration policy on universities ’ knowledge innovation and achievements transformation : based on innovation chain. *The Journal of Technology Transfer*.
- Cheng, M. Y., Hen, K. W., Tan, H. P., & Fok, K. F. (2013). Patterns of co-authorship and research collaboration in Malaysia. *Aslib Proceedings*, 65, 6.
- Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In *Modern methods for business research*. (pp. 295–336). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Chin W.W. (2010) How to Write Up and Report PLS Analyses. In: Esposito Vinzi V., Chin W., Henseler J., Wang H. (eds) Handbook of Partial Least Squares. Springer Handbooks of Computational Statistics. Springer, Berlin, Heidelberg
- Choy, L. T. (2014). The strengths and weaknesses of research methodology: Comparison and complimentary between qualitative and quantitative approaches. *Journal Of Humanities And Social Science*, 19(4), 99–104.
- Cole, M. S., Harris, S. G., & Bernerth, J. B. (2006). Exploring the implications of vision , appropriateness , and execution of organizational change. *Leadership & Organization Development Journal*, 352–367.
- Connelly, L. M. (2008). Pilot studies. *Medsurg Nursing : Official Journal of the Academy of Medical-Surgical Nurses*, 17(6), 411–2.

- Cresswell, J. W. (2009). *Research Design Qualitative, Quantitative, and Mixed Methods Approach Third Edition*. (Third). Thousand Oaks, California: SAGE Publication Inc.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334.
- Crotty, M. (1998). Introduction: the research process. *The Foundations of Social Research: Meaning and Perspective in the Research Process*, 256.
- Cunningham, J. A., & Link, A. N. (2014). Fostering university-industry R & D collaborations in European Union countries. *International Entrepreneurship and Management Journal*, 849–860.
- D’Este, P., Guy, F., & Iammarino, S. (2013). Shaping the formation of university-industry research collaborations: What type of proximity does really matter? *Journal of Economic Geography*, 13(4), 537–558.
- D’Este, P., & Patel, P. (2007). University-industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy*, 36(9),
- D’Este, P., & Perkmann, M. (2011). Why do academics engage with industry? The entrepreneurial university and individual motivations. *The Journal of Technology Transfer*, 36(3), 316–339.
- Dalkir, K. (2011). *Knowledge Management in Theory and Practice. Knowledge Management* (Vol. 4). Oxford, UK: Elsevier Butterworth-Heinemann.
- Dallago, B. (2014). The role of universities in local development. *Corvinus Journal of Sociology and Social Policy*, 5(October 2013), 35–59.
- Davis, L. L. (1992). Instrument review: Getting the most from a panel of experts. *Applied Nursing Research*, 5(4), 194–197.
- de Dominicis, L., Pérez, S., & Fernández-Zubieta, A. (2011). European university funding and financial autonomy: A study on the degree of diversification of university budget and the share of competitive funding. European Commission Joint Research Centre Institute for Prospective Technological Studies.
- Denny, H. R., & Remmers, H. H. (1940). T1 Reliability of multiple-choice as a function of the Spearman-Brown prophecy formula, II. *Journal of Educational Psychology*, 31, 699–704.
- Departemen, M., Fkm, E., Departemen, D., Fkm, E., Jl, U. S. U., No, U., & Medan, K. U. S. U. (2011). Foundations of academic entrepreneurship: A path model for

- the prediction of scientists' academic entrepreneurial intention. *Magnetic Resonance Imaging*, (April), 1–5.
- Deste, P., Mahdi, S., Neely, A., & Rentocchini, F. (2012). Inventors and entrepreneurs in academia: What types of skills and experience matter? *Technovation*, 32(5), 293–303.
- Dirks, K. T., & Ferrin, D. L. (2001). The Role of Trust in Organizational Settings. *Organization Science*, 12(4), 450–467.
- Dong, G., Liem, C. G., & Grossman, M. (2010). Knowledge-sharing intention in Vietnamese organizations. *Vine*, 40(3/4), 262–276.
- Dr. Arham Abdullah. (2017). “ industry-academia collaboration: a new dimension in malaysia.” *Ministry Of Higher Education*, (January).
- Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments, and Computers*, 28(1), 1–11.
- Erdfelder, E., FAul, F., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160.
- Estermann, T., & Pruvot, E. B. (2011). *Financially Sustainable Universities II European universities diversifying income streams*.
- Faizal, M., & Amat, A. (2015). Success factors to reduce orientation and resources-related barriers in university-industry R & D Collaboration particularly during development research stages. *Procedia - Social and Behavioral Sciences*, 172, 375–382.
- F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, 26(2), 106–121.
- F.Rusly, P. S. J. C. (2015). Change Readiness: Creating Understanding and Capability for the Knowledge Acquisition Process. *Journal of Knowledge Management*, 19(6).
- Farley, A. (2013). FEDERAL GOVERNMENT FUNDING REFORMS : ISSUES AND CHALLENGES FACING MALAYSIAN PUBLIC UNIVERSITIES. *International Journal of Asian Social Science*, 3(1), 282–298.

- Fiaz, M. (2013). An empirical study of university–industry R&D collaboration in China: Implications for technology in society. *Technology in Society*, 35(3), 191–202.
- Filippetti, A., & Savona, M. (2017). University–industry linkages and academic engagements: individual behaviours and firms’ barriers. Introduction to the special section. *Journal of Technology Transfer*, 42(4), 719–729.
- Fini, R., Lacetera, N., & Shane, S. (2010). Inside or outside the IP system? Business creation in academia. *Research Policy*, 39(8), 1060–1069.
- Fisch, C. O., Hassel, T. M., Sandner, P. G., & Block, J. H. (2015). University patenting: a comparison of 300 leading universities worldwide. *Journal of Technology Transfer*, 40(2), 318–345.
- Fischer, B. B., Schaeffer, P. R., Vonortas, N. S., & Queiroz, S. (2018). Quality comes first: university-industry collaboration as a source of academic entrepreneurship in a developing country. *Journal of Technology Transfer*, 43(2), 263–284.
- Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. Reading, MA: Addison-Wesley. 4
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behaviour : the reasoned action approach*. Psychology Press.
- Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, 18(3), 382.
- Foss, N. J. (2011). Invited Editorial: Why Micro-Foundations for Resource-Based Theory Are Needed and What They May Look Like. *Journal of Management*, 37(5), 1413–1428.
- Franco, M., & Haase, H. (2015). University-industry cooperation: Researchers’ motivations and interaction channels. *Journal of Engineering and Technology Management - JET-M*, 36, 41–51.
- Fual, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G * Power 3 : A flexible statistical power analysis program for the social , behavioral , and biomedical sciences. *Behaviour Research Methods*, 39(2), 175–191.
- Fullwood, R., Rowley, J., & Delbridge, R. (2013). Knowledge sharing amongst academics in UK universities. *Journal of Knowledge Management*, 17(1), 123–136.

- Gagné, M. (2009). A model of knowledge-sharing motivation. *Human Resource Management, 48*(4), 571–589.
- Gal, V., & Plewa, C. (2016). What drives and inhibits university-business cooperation in Europe? A comprehensive assesment. *R&D Management 369–382*.
- Gamal Aboelmaged, M. (2010). Predicting e-procurement adoption in a developing country. *Industrial Management & Data Systems, 110*(3), 392–414.
- Garland, R. (1991). The Mid-Point on a Rating Scale: Is it Desirable? *Marketing Bulletin, 3–6*.
- Gefen, D., Rigdon, E. E., & Straub, D. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Science Research. *MIS Quarterly, 35*(2), A1–A7.
- Gefen, D., & Straub, W. D. (2000). Structural Equation Modeling and Regression: Guidelines for Research for Research Practice, *4*(October), 2–79.
- Gera, R. (2012). Bridging the gap in knowledge transfer between academia and practitioners. *International Journal of Educational Management, 26*, 252–273.
- Gertner, D., Roberts, J., & Charles, D. (2011). University-industry collaboration: a CoPs approach to KTPs. *Journal of Knowledge Management, 15*, 625–647.
- Goh, S. K., & Sandhu, M. S. (2013). Knowledge Sharing Among Malaysian Academics: Influence of Affective Commitment and Trust. *Electronic Journal of Knowledge Management, 11*(1), 38–48.
- Goodhue, D. L., Lewis, W., & Thompson, R. (2012). Does PLS Have Advantages for Small Sample Size or Non-Normal Data? *MIS Quarterly, 36*(3), 981–1001.
- Grimpe, C., & Hussinger, K. (2013). Formal and Informal Knowledge and Technology Transfer from Academia to Industry: Complementarity Effects and Innovation Performance. *Industry and Innovation*. Taylor & Francis.
- Guan, J. C., Yam, R. C. M., & Mok, C. K. (2005). Collaboration between industry and research institutes / universities on industrial innovation in Beijing, China. *Technology Analysis & Strategic Management, 17*(3), 339–353.
- Guimón, J. (2013). Promoting University-Industry Collaboration in Developing Countries. *The Innovation Policy Platform, 1–11*.
- Gulbrandsen, M., & Thune, T. (2017). The effects of non-academic work experience on external interaction and research performance. *Journal of Technology Transfer, 42*(4), 795–813.

- Hair, J. F. (2016a). *A primer on partial least squares structural equation modeling (PLS-SEM)*.
- Hair, J. F. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (Second edition.).
- Hair, J. F., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis* (7th ed.). Prentice Hall.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, 19(2), 139–152.
- Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, 45(5–6), 320–340.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, 40(3), 414–433.
- Hair, J., Hult, G. T., Ringle, C., & Sarstedt, M. (2014a). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). *2014 Faculty Bookshelf*.
- Haller, J. a. (2014). Strengthened ties between industry and academia are historical, productive, and crucial. *Survey of Ophthalmology*, 59(3), 348–353.
- Hamdan, H., Yusof, F., Omar, D., Abdullah, F., Nasrudin, N., & Abullah, I. C. (2011a). University Industrial Linkages : Relationship Towards Economic Growth and Development in Malaysia. *Engineering and Technology*, 5(10), 785–792.
- Han, H., Hsu, L.-T. (Jane), & Sheu, C. (2010). Application of the Theory of Planned Behavior to green hotel choice: Testing the effect of environmental friendly activities. *Tourism Management*, 31(3), 325–334.
- Haque, M. M., Ahlan, A. R., Jalaldeen, M., Razi, M., & Subiyakto, A. (2016). Investigating Factors Affecting Knowledge Management and Sharing on Innovation in Universities : Pilot Study, 64–69.
- Hardesty, D. M., & Bearden, W. O. (2004). The use of expert judges in scale development Implications for improving face validity of measures of unobservable constructs, 57, 98–107.

- Hartley, S. L., & Maclean, W. E. (2006). A review of the reliability and validity of Likert-type scales for people with intellectual disability. *Journal of Intellectual Disability Research, 50*(11), 813–827.
- Hawkins, R. J., Swanson, B., Kremer, M. J., & Fogg, L. (2014). Content validity testing of questions for a patient satisfaction with general anesthesia care instrument. *Journal of Perianesthesia Nursing, 29*(1), 28–35.
- Hemmert, M., Bstieler, L., & Okamuro, H. (2014). Bridging the cultural divide: Trust formation in university-industry research collaborations in the US, Japan, and South Korea. *Technovation, 34*(10), 605–616.
- Heng, L. H., Rasli, A. M., & Senin, A. A. (2012). Knowledge Determinant in University Commercialization: A Case Study of Malaysia Public University. *Procedia - Social and Behavioral Sciences, 40*, 251–257.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of research on international advertising* (pp. 252-276).
- Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in Nursing & Health, 31*(2), 180–191.
- Holt, D. T., Armenakis, A. A., Feild, H. S., & Harris, S. G. (2007a). Readiness for organizational change: The systematic development of a scale. *The Journal of Applied Behavioral Science, 43*, 232–255.
- Holt, D. T., Bartczak, S., Clark, S., & Trent, M. (2007). The development of an instrument to measure readiness for knowledge management. *Knowledge Management Research & Practice, 5*(5), 75–92.
- Holt, D. T., Bartczak, S. E., Clark, S. W., & Trent, M. R. (2004). The development of an instrument to measure readiness for knowledge management. *37th Annual Hawaii International Conference on System Sciences, 2004. Proceedings of The, 00*(C), 1–
- Holt, D. T., & Vardaman, J. M. (2013). Toward a comprehensive understanding of readiness for change: The case for an expanded conceptualization. *Journal of Change Management, 13*(1), 9–18.
- Holzberger, D., Philipp, A., & Kunter, M. (2013). How Teachers' Self-Efficacy Is Related to Instructional Quality: A Longitudinal Analysis. *Journal of Educational Psychology, 105*(3), 774–786.

- Hong, W., & Su, Y. S. (2013). The effect of institutional proximity in non-local university-industry collaborations: An analysis based on Chinese patent data. *Research Policy*, 42(2), 454–464.
- Huang, M. H., & Chen, D. Z. (2017). How can academic innovation performance in university–industry collaboration be improved? *Technological Forecasting and Social Change*, 123, 210–215.
- Hung, S.-W., & Cheng, M.-J. (2013). Are you ready for knowledge sharing? An empirical study of virtual communities. *Computers & Education*, 62, 8–17.
- Hung, S.-Y., Durcikova, A., Lai, H.-M., & Lin, W.-M. (2011). The influence of intrinsic and extrinsic motivation on individuals' knowledge sharing behaviour. *International Journal of Human-Computer Studies*, 69(6), 415–427.
- Hung, S., Lai, H., & Chou, Y. (2015). Knowledge-sharing Intention in Professional Virtual Communities : A Comparison Between Posters and Lurkers. *Journal Of The Journal Of The Association For Information Science And Technology*. 66(168), 2494–2510.
- Iorio, R., Labory, S., & Rentocchini, F. (2017). The importance of pro-social behaviour for the breadth and depth of knowledge transfer activities: An analysis of Italian academic scientists. *Research Policy*, 46(2), 497–509.
- Iqbal, A. M., Khan, A. S., Iqbal, S., & Senin, A. A. (2011). Designing of Success Criteria-based Evaluation Model for Assessing the Research Collaboration between University and Industry. *International Journal of Business Research and Management*, 2(2), 59–73.
- Iqbal, A. M., Khan, A. S., Bashir, F., & Senin, A. A. (2017). Evaluating National Innovation System of Malaysia Based on University-industry Research Collaboration.
- Iqbal, A. M., Khan, A. S., Parveen, S., & Senin, A. A. (2015). An Efficient Evaluation Model for the Assessment of University-industry Research Collaboration in Malaysia Faculty of Management , Universiti Teknologi Malaysia , Malaysia Faculty of Computer Science and Information Technology , Universiti Malaysia Sarawak , Malaysia, 10(3), 298–306.
- Ismail, N., & Mohd, J. (2015). A Framework for a Successful Research Products Commercialisation : A Case of Malaysian Academic Researchers. *Procedia - Social and Behavioral Sciences*, 195, 283–292.

- Ivascu, L., Cirjaliu, B., & Draghici, A. (2016). Business model for the university-industry collaboration in open innovation. *Procedia Economics and Finance*, 39(November 2015), 674–678.
- Jacoby, J., Crocker, D. C., & Armstrong, J. S. (1971). COMMUNICATIONS AND NOTES Three-Point Likert Scales. *Journal of Marketing Research*, 8(4), 495–500.
- Jasmine, T. R., & Joshua, A. L. Y. (2013). An Empirical Inquiry on Knowledge Sharing Among Academicians in Higher Learning Institutions. *J. Minerva* (2013), 131–154.
- Jauhari, V. (2013a). Fostering effective university-industry partnerships: concluding remarks. *Worldwide Hospitality and Tourism Themes*, 5, 301–306.
- Jauhari, V. (2013b). Fostering effective university-industry partnerships: concluding remarks. *Worldwide Hospitality and Tourism Themes*, 5(3), 301–306.
- Jeon, S., Kim, Y., & Koh, J. (2011a). An integrative model for knowledge sharing in communities-of-practice. *Journal of Knowledge Management*, 15(2), 251–269.
- Jeon, S., Kim, Y., & Koh, J. (2011b). An integrative model for knowledge sharing in communities-of-practice. *Journal of Knowledge Management*, 15(2), 251–269.
- Jin, J., Wu, S., & Chen, J. (2011). International university-industry collaboration to bridge R&D globalization and national innovation system in China. *Journal of Knowledge-Based Innovation in China*, 3, 5–14.
- John P. Kotter. (1995). Leading change: Why transformation efforts fail. *Harvard Business Review*, 73, 59–67(June).
- Jolae, A., Md Nor, K., Khani, N., & Md Yusoff, R. (2014). Factors affecting knowledge sharing intention among academic staff. *International Journal of Educational Management*, 28(4), 413–431.
- Kafouros, M., Wang, C., Piperopoulos, P., & Zhang, M. (2015). Academic collaborations and firm innovation performance in China: The role of region-specific institutions. *Research Policy*, 44(3), 803–817.
- Karim, N. S. A. (2012). Measuring employee readiness for knowledge management using intention to be involved with KM SECI processes. *Business Process Management Journal*, 18(5), 777–791.
- Kautonen, T., van Gelderen, M., & Fink, M. (2015). Robustness of the theory of planned behaviour in predicting entrepreneurial intentions and actions. *Entrepreneurship: Theory and Practice*, 39(3), 655–674.

- Kaymaz, K., & Yasin Eryigit, K. (2011). Determining Factors Hindering University-Industry Collaboration : An Analysis from the Perspective of Academicians in the Context of Entrepreneurial Science Paradigm. *International Journal of Social Inquiry*, 4(1), 185–213.
- Konovsky, M. A., Pugh, S. D., & Pugh, S. D. (2013). Citizenship Behavior and Social Exchange. *Academy of Management Journal*, 37(3), 656–669.
- Kortteisto, T., Kaila, M., Komulainen, J., Mäntyranta, T., & Rissanen, P. (2010). Healthcare professionals ' intentions to use clinical guidelines : a survey using the theory of planned behaviour. *Implementation Science*, 1–10.
- Kothari, C., Kumar, R., & Uusitalo, O. (2014). *Research Methodology. New Age International*.
- Krejcie, R.V., & Morgan, D.W., (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*.
- Krueger, J. N. F., & Carsrud, A. L. (1993). Entrepreneurship & Regional Development : An International Entrepreneurial intentions : Applying the theory of planned behaviour. *Entrepreneurship & Regional Development*, 5(June 2012), 315–330.
- Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5), 411–432.
- Kwon, Y. (2015). An Empirical Study on the Factors Affecting Academic Technology Entrepreneurship in South Korea. *IEEE*, 385–392.
- Lacey, E. a. (1994). Research utilization in nursing practice--a pilot study. *Journal of Advanced Nursing*, 19(5), 987–95.
- Lai, W. H. (2011). Willingness-to-engage in technology transfer in industry-university collaborations. *Journal of Business Research*, 64(11), 1218–1223.
- Lakshman, M., Sinha, L., Biswas, M., Charles, M., & Arora, N. K. (2000). Quantitative vs qualitative research methods. *Indian Journal of Pediatrics*, 67(5), 369–377.
- Landry, R., Saihi, M., Amara, N., & Ouimet, M. (2010). Evidence on how academics manage their portfolio of knowledge transfer activities. *Research Policy*, 39, 1387–
- Lee, J. (1994). Odds ratio or relative risk for cross-sectional data? *International Journal of Epidemiology*, 23(1), 201–3.

- Lee, J., Shiue, Y., & Chen, C. (2016). Computers in Human Behavior Examining the impacts of organizational culture and top management support of knowledge sharing on the success of software process improvement. *Computers in Human Behavior, 54*, 462–474.
- Lewin, K. (1947). Frontiers in Group Dynamics: Concept, Method and Reality in Social Science; Social Equilibria and Social Change. *Human Relations, 1*(1), 5–41.
- Liebowitz, J. (2012). Beyond knowledge management : what every leader should know. *New York, NY: CRC Press Taylor & Francis group.*
- Lim, W. Y., Amat-senin, A., & Low, H. H. (2016). Exploring the Barriers Affecting Malaysian University Symbiosis Program in University-Industry Commercialization, 9(September).
- Lin, H. (2007). Knowledge sharing and firm innovation capability: an empirical study. *International Journal of Manpower, 28*(3/4), 315–332.
- Lind, F., Styhre, A., & Aaboen, L. (2013). Exploring university-industry collaboration in research centres. *European Journal of Innovation Management, 16*, 70–91.
- Losby, J., & Wetmore, A. (2012). Using Likert Scale in Evaluation Survey Work. *National Center for Chronic Disease Prevention and Health Promotion, 1–22.*
- Lynn, M. R. (1986). Determination and Quantification of Content Validity. *Nursing Research, 31*(1), 1–8.
- Ma, G., Gu, L., & Li, N. (2015). Scenario Based Proactive Robust Optimization for Critical Chain Project Scheduling. *Journal of Construction Engineering and Management, 141*(10), 1–12.
- Mafenya, P. N. (2013). Investigation of the Collaborative Relationship between Industry and Academic Education in Open and Distance Learning: A South African Context. *Mediterranean Journal of Social Sciences, 4*(13), 43–50.
- Management, E. (2012). An integrated theoretical model for determinants of knowledge sharing behaviours. *Kybernetes, Vol. 41 Issue: 10, pp.1462-1482.*
- Mansor, N. N. A., Rahman, A. A., Khademi, T., & Shafaghat, A. (2015). The Status and Characteristics of University- Industry Collaboration in a Research University. *Jurnal Teknologi, 4*(MAY), 135–139.
- Marcoulides, G. A., & Saunders, C. (2006). Editor's Comments: PLS: A Silver Bullet? *MIS Quarterly, 30*(2), iii–ix.

- Maria Theresa Norn, J. W. (2014). UNIVERSITY RESEARCHERS' COLLABORATION WITH INDUSTRY AND THE PUBLIC SECTOR. *Consultant*.
- Mark, E.-S., Richard, T., & Paul, J. (2012). *Management Research* (Fourth). Los Angeles, California: SAGE Publication Inc.
- Masa'deh, D. R., Gharaibeh, E. A. H., Tarhini, D. A., & Obeidat, D. B. Y. (2015). Knowledge Sharing Capability: A Literature Review. *SSRN Electronic Journal*, 2(5), 1–16.
- Maxell, M. S., & Jacoby, J. (1972). IS THERE AN OPTIMAL NUMBER OF ALTERNATIVES FOR LIKERT-SCALE ITEMS? *Journal of Applied Psychology*, 56(6), 506–509.
- Merriam, S. B. (1995). What can you tell from an N of 1? Issues of validity and reliability in qualitative research. *PAACE Journal of Lifelong Learning*.
- Mohamed, Z. A. K. A., Mad Shah, I., & Jusoh, A. (2016). Consideration and Methodological Approaches in Studying Transformational leadership Impact on Work Performance Behaviors. *International Journal of Advanced Research*, 4(1), 889–907.
- Mohd, W., Hussain, H. W., Nizam, M., Rahman, A., Zainol, Z. A., & Inayahyaakub, N. (2014). Mechanism and Government Initiatives Promoting Innovation and Commercialization of University Invention. *Pertanika J. Soc. Sci. & Hum*, 22(December 1980), 131–148.
- Moksony, F., & Heged, R. (1990). Small is beautiful. The use and interpretation of R2 in social research. *Szociológiai Szemle*, Special issue. 130-138.
- Motoyama, Y. (2014). Long-term collaboration between university and industry: A case study of nanotechnology development in Japan. *Technology in Society*, 36(1), 39–51.
- Nagamani, G., Katyayani, J., Padmavathi, S., Viswa, M., Pradesh, A., Padmavathi, S., ... Pradesh, A. (2013). Knowledge Sharing Practices Among Academicians : Assessing the Role of Demographic Variables. *International Journal of Business Management & Research (IJBMR)*, 3(4), 113–124.
- Naser, M., Afzal, I., Bin, K., & Mansur, H. J. (2017). An Empirical Investigation of Triple Helix and National Innovation System Dynamics in ASEAN-5 Economies, 313–331.

- Neves, P., & Neves, P. (2009). Readiness for Change : Contributions for Employee ' s Level of Individual Change and Turnover Intentions Readiness for Change : Contributions for Employee ' s Level of Individual Change and Turnover Intentions, (October 2014). *Journal of Change Management* 9:2, 215-231.
- Nezakati, H., Moghadas, S., Aziz, Y. A., Amidi, A., Sohrabinezhadtalemi, R., & Jusoh, Y. Y. (2015). Effect of Behavioral Intention toward Choosing Green Hotels in Malaysia – Preliminary Study. *Procedia - Social and Behavioral Sciences*, 172, 57–62.
- Nitrogen, E. O. F., On, S., Yield, F., & Tomato, O. F. (2011). 1 ,*, 2 2 1, (April), 50–60.
- Normah, O. (2011). An Assessment of a University-Industry Partnership in a Malaysian University. *International Journal of Business and Social Science*, 2(8), 94–104.
- Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education*, 15(5), 625–632.
- Nunnally, J. C. (1978). Psychometric theory. *McGraw-Hill. McGraw-Hill; 3rd edition*.
- Nyeko, K. E., & Sing, N. K. (2015). Academic Entrepreneurs and Entrepreneurial Academics: Are They the Same. *International Journal of Social Science and Humanity*, 5(12), 1050–1055.
- Othman, A., Haiyat, U., & Kohar, A. (2014). University-Industry Technology Commercialization in Malaysia : Opportunities and Challenges. *World Appl. Sci. J.*, 30 (Innovation Challenges in Multidisciplinary Research & Practice), 30, 167–184.
- Othman, R., & Omar, A. F. (2012). University and industry collaboration: Towards a successful and sustainable partnership. *Procedia - Social and Behavioral Sciences*, 31(2011), 575–579.
- Paper, W. (n.d.). Why do academics engage with industry? The entrepreneurial university and individual motivations. *The Journal of Technology Transfer*, 36(3):316-339
- Pasher, E., & Ronen, T. (2011). *The complete guide to knowledge management: A strategic plan to leverage your company's intellectual capital*. Hoboken, New Jersey: John Wiley & Sons, Inc.

- Patrick, D. L., Burke, L. B., Gwaltney, C. J., Leidy, N. K., Martin, M. L., Molsen, E., & Ring, L. (2011). Content validity - Establishing and reporting the evidence in newly developed patient-reported outcomes (PRO) instruments for medical product evaluation: ISPOR PRO good research practices task force report: Part 2 - Assessing respondent understanding. *Value in Health, 14*(8), 978–988.
- Perkmann, M., King, Z., & Pavelin, S. (2011). Engaging excellence? Effects of faculty quality on university engagement with industry. *Research Policy, 40*(4), 539–552.
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D’Este, P., ... Sobrero, M. (2013a). Academic engagement and commercialisation: A review of the literature on university-industry relations. *Research Policy, 42*(2), 423–442.
- Pertuzé, J. A., Calder, E. S., Edward, M., & Lucas, W. A. (2010). Best Practices for Collaboration Best Practices for Industry. *MIT Sloan Management Review, 51*(4), 83–90.
- Plewa, C., Korff, N., Johnson, C., MacPherson, G., Baaken, T., & Rampersad, G. C. (2013). The evolution of university-industry linkages - A framework. *Journal of Engineering and Technology Management - JET-M, 30*(1), 21–44.
- Polit, D. F., & Tatano, C. (2010). International Journal of Nursing Studies Generalization in quantitative and qualitative research : Myths and strategies. *International Journal of Nursing Studies, 47*(11), 1451–1458.
- Ponomariov, B., & Craig Boardman, P. (2008). The effect of informal industry contacts on the time university scientists allocate to collaborative research with industry. *Journal of Technology Transfer, 33*(3), 301–313.
- Ponti, M. (2012). Peer production for collaboration between academics and practitioners. *Journal of Librarianship and Information Science*.
- Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling : Why and How of it ? Anita S Acharya , (May 2014). *Indian Journal Of Medical Specialitie, 3–7*.
- Prem, D., Chandranl, K., Kooi, Y., Hasri, M., Harizanl, M., Koo, C. C., ... Fiz, B. L. (2010). Enhance Teaching And Research In Electronic Packaging. *Technology*.
- Rafferty, A. E., Jimmieson, N. L., & Armenakis, A. A. (2012). Change Readiness: A Multilevel Review. *Journal of Management, 39*(1), 110–135.
- Rahab, & Wahyuni, P. (2013). Predicting Knowledge Sharing Intention Based on Theory of Reasoned Action Framework : An Empirical Study on Higher

- Education Institution. *American International Journal of Contemporary Research*, 3(1), 138–147.
- Rajalo, S., & Vadi, M. (2017). University-industry innovation collaboration: Reconceptualization. *Technovation*, 62–63(April), 42–54.
- Ramakrishnan, K., & Yasin, N. M. (2011). NO - Higher learning institution - Industry collaboration: A necessity to improve teaching and learning process. *ICCSE 2011 - 6th International Conference on Computer Science and Education, Final Program and Proceedings*, (Iccse), 1445–1449.
- Ramayah, T., Yeap, J. A. L., & Ignatius, J. (2014). Assessing Knowledge Sharing Among Academics. *Evaluation Review*, 38(2), 160–187.
- Ramli, F., Yu, W., & Amat, A. (2013). Proposing a Conceptual Framework on Factors to Develop Successful. *Jurnal Teknologi*, 2, 13–19.
- Rasiah, R., & Govindaraju, C. (2009). University-Industry R&D Collaboration in the Automotive, Biotechnology and Electronics Firms in Malaysia. *7th Globelics Conference*, (October), 6–8.
- Rast, S., Khabiri, N., & Senin, A. A. (2012). Evaluation Framework for Assessing University-Industry Collaborative Research and Technological Initiative. *Procedia - Social and Behavioral Sciences*, 40, 410–416.
- Razak, N. A., Azlina, N., Yunus, M., Pangil, F., & Asnawi, N. H. (2014). Theories of Knowledge Sharing Behavior in Business Strategy. *IEEE Symposium on Business, Engineering and Industrial Applications*, 187–192.
- Razmerita, L., Kirchner, K., & Nielsen, P. (2016). What factors influence knowledge sharing in organizations? A social dilemma perspective of social media communication. *Journal of Knowledge Management*, 20(6), 1225–1246.
- Reetta, M., Janne, L., Juha, T., & Antero, K. (2015). New Forms of University-Industry Collaboration in Finland: Key results of the National Survey Introduction : new perspective on the use of intangible assets, (2).
- Reychav, I., & Weisberg, J. (2010a). Bridging intention and behaviour of knowledge sharing. *Journal of Knowledge Management*, 14(2), 285–300.
- Reychav, I., & Weisberg, J. (2010b). Bridging intention and behaviour of knowledge sharing. *Journal of Knowledge Management*, 14(2), 285–300.
- Ritala, P., Olander, H., Michailova, S., & Husted, K. (2015). Technovation Knowledge sharing , knowledge leaking and relative innovation performance : An empirical study. *Technovation*, 35, 22–31.

- Rusly, F. H., Corner, J. L., & Sun, P. (2012). Positioning change readiness in knowledge management research. *Journal of Knowledge Management*, 16(2), 329–355.
- Rusly, F., Yih-Tong Sun, P., & L. Corner, J. (2014). The impact of change readiness on the knowledge sharing process for professional service firms. *Journal of Knowledge Management*, 18(4), 687–709.
- Safa, N. S., & Von Solms, R. (2016). An information security knowledge sharing model in organizations. *Computers in Human Behavior*, 57, 442–451.
- Salimi, N., Bekkers, R., & Frenken, K. (2013). Governance and success of university-industry collaborations on the basis of Ph. D. projects—an explorative study. *Eindhoven Center for Innovation*, 1–25.
- Salleh, M. S., & Omar, M. Z. (2013a). University-industry Collaboration Models in Malaysia. *Procedia - Social and Behavioral Sciences*, 102(Ifee 2012), 654–664.
- Samara, K. (2013). Readiness As a Microfoundational Approach To Knowledge Management. *Journal of Knowledge Management Practice*, 14(1), 1–15.
- Samara, K. (2015). Readiness for Change in Knowledge Sharing Initiatives : Grounded in Micro-Foundations. Available at SSRN: <https://ssrn.com/abstract=2676677> or <http://dx.doi.org/10.2139/ssrn.2676677>.
- Sandelowski, M. (2000). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing & Health*, 23(3), 246–255.
- Sarpong, D., Abdrazak, A., Alexander, E., & Meissner, D. (2015). Organizing practices of university , industry and government that facilitate (or impede) the transition to a hybrid triple helix model of innovation. *Technological Forecasting & Social Change*.
- Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). Partial Least Squares Structural Equation Modeling. In *Handbook of Market Research* (pp. 1–40).
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2012). *Research methods for business students*. Pearson.
- Schauer, A. (2014). Developing a holistic framework of key categories of influences that shape knowledge sharing from an individual perspective.
- Schriesheim, C. A., Powers, K. J., Scandura, T. A., Gardiner, C. C., & Lankau, M. J. (1993). *Journal of Management*.

- Schubert, P., & Bjørn-Andersen, N. (2012). University-Industry Collaboration in IS Research : An Investigation of Successful Collaboration Models 1 Introduction , Motivation and Research Question. *25th Bled EConference EDependability:Reliable and Trustworthy EStructures,EProcesses,EOperations and EServices for the Future*, 109–126.
- Science, M. O. F. (2016). *National Survey Of Research And Development (R&D) In Malaysia 2016*.
- Sekaran, U. and Bougie, R. (2013) *Research Methods for Business: A Skill-Building Approach*. 6th Edition, Wiley, New York.
- Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill-building approach* (5th ed.). *Haddington: John Wiley & Sons*.
- Shahzadi, I., Hameed, R. M., & Kashif, A. R. (2015). Individual motivational factors of optimistic knowledge sharing behaviour among University academia. *The Business & Management Review*, 6(1), 2–3.
- Shirazi, a, Mortazavi, S., & Azad, N. P. (2011). Factors affecting employees' readiness for knowledge management. *European Journal of ...*, 33(33), 167–177.
- Sita Nirmala Kumaraswamy, K., & Chitale, C. M. (2012). Collaborative knowledge sharing strategy to enhance organizational learning. *Journal of Management Development*, 31(3), 308–322.
- Skaik, H. A., & Othman, R. (2014). Determinants of Knowledge Sharing Behaviour among Academics in United Arab Emirates. *International Journal of Knowledge and Systems Science*, 5(3), 54–70.
- Edwin R. van Teijlingen and Vanora Hundley(1998). The importance of pilot studies, (35).
- Steckler, A., McLeroy, K. R., Goodman, R. M., Bird, S. T., & McCormick, L. (1992). Toward Integrating Qualitative and Quantitative Methods: An Introduction. *Health Education Quarterly*, 19(1), 1–8.
- Stenius, M., Hankonen, N., Haukkala, A., & Ravaja, N. (2015). Understanding knowledge sharing in the work context by applying a belief elicitation study. *Journal of Knowledge Management*, 19(3), 497–513.
- Subramonian, H., & Rasiah, R. (2016). University – industry collaboration and technological innovation : sequential mediation of knowledge transfer and barriers in automotive and biotechnology firms in Malaysia (pp. 77-99).

Journal Asian Journal of Technology Innovation. Volume 24, 2016 - Issue 1
1597(April).

- Sugandhavanija, P., Sukchai, S., Ketjoy, N., & Klongboonjit, S. (2011). Determination of effective university-industry joint research for photovoltaic technology transfer (UIJRPTT) in Thailand. *Renewable Energy*, 36(2), 600–607.
- Suppiah, V., & Singh Sandhu, M. (2011). Organisational culture's influence on tacit knowledge-sharing behaviour. *Journal of Knowledge Management*, 15(3), 462–477.
- Tan, C. N. L., & Ramayah, T. (2014). The role of motivators in improving knowledge-sharing among academics. *Information Research*, 19(1).
- Tan, N., Lye, Y., Ng, T., & Lim, Y. S. (2010a). Motivational factors in influencing knowledge sharing among banks in Malaysia. *International Research Journal of Finance and ...*, 4(44), 186–197.
- Tangaraja, G., Mohd Rasdi, R., Ismail, M., & Abu Samah, B. (2015). Fostering knowledge sharing behaviour among public sector managers: a proposed model for the Malaysian public service. *Journal of Knowledge Management*, 19(1), 121–140.
- Tartari, V., Perkmann, M., & Salter, A. (2014). In good company: The influence of peers on industry engagement by academic scientists. *Research Policy*, 43(7), 1189–1203.
- Taylor, P., Chennamaneni, A., Teng, J. T. C., & Raja, M. K. (n.d.). Behaviour & Information Technology A unified model of knowledge sharing behaviours : theoretical development and empirical test, (January 2013), 37–41.
- Teng, Y. M., Wu, K. S., & Liu, H. H. (2015). Integrating Altruism and the Theory of Planned Behavior to Predict Patronage Intention of a Green Hotel. *Journal of Hospitality and Tourism Research*, 39(3), 299–315.
- Ting, S. H., Yahya, S., & Tan, C. L. (2018). The influence of researcher competence on university-industry collaboration The mediating role of domain knowledge.
- Tohidinia, Z., & Mosakhani, M. (2010). Knowledge sharing behaviour and its predictors. *Industrial Management & Data Systems*, 110(4), 611–631.
- Topa, G. (2010). Theory of planned behaviour and smoking : meta-analysis and SEM model, 23–33.

- Tsai, M.-T., Chen, K.-S., & Chien, J.-L. (2012). The factors impact of knowledge sharing intentions: the theory of reasoned action perspective. *Quality & Quantity*, 46(5), 1479–1491.
- Uprichard, E. (2013). International Journal of Social Sampling : bridging probability and non- probability designs, (December 2014), 37–41.
- Uriartre, J. F. A. (2008). *Introducton to Knowledge Management*. Jakarta, Indonesia: ASEAN Foundation.
- Van Dinther, M., Dochy, F., & Segers, M. (2011). Factors affecting students' self-efficacy in higher education. *Educational Research Review*, 6(2), 95–108.
- Van Teijlingen, E. R., Rennie, A. M., Hundley, V., & Graham, W. (2001). The importance of conducting and reporting pilot studies: The example of the Scottish Births Survey. *Journal of Advanced Nursing*, 34(3), 289–295.
- Veera, V. G. R. C., & Kaliani, P. (2013). Innovation systems in Malaysia : a perspective of university — industry R & D collaboration.
- Verma, V. K., & Chandra, B. (2018). An application of theory of planned behaviour to predict young Indian consumers' green hotel visit intention. *Journal of Cleaner Production*, 172, 1152–1162.
- Vidaver-Cohen, D. (1998). Moral Climate in Business Firms: A Conceptual Framework for Analysis and Change. *Journal of Business Ethics*, 17(11), 1211–1226.
- Wahyuni, D. (2012). The research design maze: Understanding paradigms, cases, methods and methodologies. *Journal of Applied Management Accounting Research*, 10(1), 69–80.
- Wang, S., & Noe, R. A. (2010). Knowledge sharing : A review and directions for future research Keywords. *Human Resource Management Review*, 20(2), 115–131.
- Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human Resource Management Review*, 20(2), 115–131.
- Weiner, B. J. (2009). A theory of organizational readiness for change. *Implementation Science*, 4(1), 67.
- Wilson, A., & Laskey, N. (2003). Internet based marketing research: A serious alternative to traditional research methods? *Marketing Intelligence & Planning*, 21(2), 79–84.

- Witherspoon, C. L., Bergner, J., Cockrell, C., & Stone, D. N. (2013). Antecedents of organizational knowledge sharing: a meta-analysis and critique. *Journal of Knowledge Management, 17*(2), 250–277.
- Wolfe, B. E. (2013). The Value of Pilot Studies in Clinical Research: A Clinical Translation of the Research Article Titled “In Search of an Adult Attachment Stress Provocation to Measure Effect on the Oxytocin System.” *Journal of the American Psychiatric Nurses Association, 19*(4), 192–194.
- Wright, K. B. (2005). Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. *Journal of Computer-Mediated Communication, 10*(3), JCMC1034-JCMC1034.
- Wirsih, A., Kock, A., Strumann, C., & Schultz, C. (2016). Effects of University–Industry Collaboration on Technological Newness of Firms, *00*(00).
- Wu, C. Y., & Mathews, J. A. (2012). Knowledge flows in the solar photovoltaic industry: Insights from patenting by Taiwan, Korea, and China. *Research Policy, 41*(3), 524–540.
- Yaakub, N. I., Wan Hussain, W. M. H., Abdul Rahman, M. N., Zainol, Z. A., Mujani, W. K., Jamsari, E. A., ... Jusoff, K. (2011). Challenges for commercialization of university research for agricultural based invention. *World Applied Sciences Journal, 12*(2), 132–138.
- Yaghmale, F. (2003). Content validity and its estimation. *Journal of Medical Education, 3*, 25–27.
- Yalçıntaş, M., Kaya, C. Ç., & Kaya, B. (2015). University-Industry Cooperation Interfaces in Turkey from Academicians’ Perspective. *Procedia - Social and Behavioral Sciences, 195*, 62–71.
- Yao, G., Wu, C. H., & Yang, C. T. (2008). Examining the content validity of the WHOQOL-BREF from respondents’ perspective by quantitative methods. *Social Indicators Research, 85*(3), 483–498.
- Yeon, K., Wong, S. F., Chang, Y., & Park, M.-C. (2016). Knowledge sharing behaviour among community members in professional research information centers. *Information Development, 32*(3), 655–672.
- Yilmaz, K. (2013). Comparison of Quantitative and Qualitative Research Traditions : epistemological , theoretical , *48*(2).

- Yu, T. K., & Yu, T. Y. (2010). Modelling the factors that affect individuals- utilisation of online learning systems: An empirical study combining the task technology fit model with the theory of planned behaviour. *British Journal of Educational Technology*, 41(6), 1003–1017.
- Yusof, M., & Jain, K. K. (2011). Entrepreneurial Leadership and Academic Entrepreneurship in Malaysian Public Research Universities, 2, 87–100.
- Zamanzadeh, V., Ghahramanian, A., Rassouli, M., Abbaszadeh, A., Alavi-Majd, H., & Nikanfar, A.-R. (2015). Design and Implementation Content Validity Study: Development of an instrument for measuring Patient-Centered Communication. *Journal of Caring Sciences*, 4(2), 165–178.

APPENDIX A: INSTRUMENT COVER LETTER



Instrument Cover Letter

Dear Participant,

My name is Muhamet Abdullahu and I am a doctoral student at the University Teknologi Malaysia (UTM). As part of my doctoral dissertation, I am conducting research on **Readiness of University Academicians towards Knowledge Sharing and Collaboration with Industry Practitioners**. You were randomly selected from a list of academicians at UTM. Your responses will be treated with high confidentiality and no identifying designations will be associated with any of the responses you make. Your contribution through your participation in this survey will assist the University to foster a better collaboration with Industry. Your participation in this survey is purely voluntarily and you may choose to withdraw your participation at any time. This survey will take approximately 10 to 15 minutes to complete

I shall take this opportunity to thank you in advance for your participation.

Sincerely,

Muhamet Abdullahu

PhD Candidate

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APPENDIX B: INSTRUMENT SURVEY

Instructions:

The survey consists of four sections. Section A requests general information about you and the job you do at your institution. This information is needed for the purpose of categorizing findings. Section B is the Readiness variables and its items. Section C consists of behaviour and attitude items pertaining knowledge sharing. Section D consists of successful collaboration items.

SECTION A: DEMOGRAPHIC INFORMATION

Please answer the below by ticking (✓) in the left box or specify in space provided

1. Age group

- 19 – 25 Years
- 26 – 33 Years
- 34 – 41 Years
- 42 – 49 Years
- 50 – 57 Years
- 58 & Above

2. Gender

- Male
- Female

3. Which Faculty/Institution in UTM you are attached to

- Faculty of Built Environment (FAB)
 - Faculty of Biosciences and Medical Engineering (FBME)
 - Faculty of Civil Engineering (FKA)
 - Faculty of Computing (FC)
 - Faculty of Electrical Engineering (FKE)
 - Faculty of Chemical and Energy Engineering (FKT)
 - Faculty of Mechanical Engineering (FKM)
 - Faculty of Geoinformation and Real Estate (FGHT)
 - Faculty of Science (FS)
 - UTM International Business School (IBS)
 - Advanced Informatics School (AIS)
 - Razak School of Engineering and Technology
 - Perdana School of Science Technology and Innovation Policy
 - Malaysian-Japan International Institute of Technology
- Others, specify _____

4. Academic post status

- Lecturer
 - Senior Lecturer
 - Assoc. Professor
 - Professor
- Others, specify _____

5. Number of years working in UTM

- Less than 1 year
- 1 year but less than 3 years
- 3 years to 5 years
- More than 5 years

6. Collaboration type you have engaged with industry. You can tick (✓) more than one box.

- Joint Research
- Contract research
- Consultancy

7. Engaged in collaboration with industry

- Never
- 1 time
- 2 to 3 times

- Commercialization
- Training
- Resources sharing and knowledge transfer
- Others, specify _____

- 4 to 5 times
- More than 6 times

SECTION B: READINESS

This section consists of readiness variables and questions. This research defines ‘Readiness’ as academicians or/and researcher’s state of being ready, motivated and technically capable for sharing knowledge and collaborating with industry practitioners.

1. Efficacy: To what extent do you feel that you are capable of fulfilling the roles associated to knowledge sharing with the industry practitioners?

	ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	When knowledge sharing is implemented with industry practitioners, I feel I can handle it with ease.	①	②	③	④	⑤
2	I have skills that are needed to make knowledge sharing work with industry practitioners.	①	②	③	④	⑤
3	My past experiences make me confident that I will be able to perform successfully when I share knowledge with industry practitioners.	①	②	③	④	⑤

2. Appropriateness: To what extent do you feel that knowledge sharing with industry practitioners will benefit the university and address university’s needs?

	ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	I think the university will benefit from knowledge sharing with industry practitioners.	①	②	③	④	⑤
2	Improving knowledge sharing with industry practitioners will make my job easier.	①	②	③	④	⑤
3	There are a number of rational reasons to improve knowledge sharing with industry practitioners.	①	②	③	④	⑤
4	In the long run, I feel it will be worthwhile for me if university improves knowledge sharing with industry practitioners.	①	②	③	④	⑤

3. Personal valence: To what extent do you feel that you will benefit from the knowledge sharing with industry practitioners?

ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1 After implementing knowledge sharing with industry practitioners, I expect to be recognized more for the work I do.	①	②	③	④	⑤
2 Improving knowledge sharing with industry practitioners makes it easier for me to feel like I am part of the team.	①	②	③	④	⑤
3 Improving knowledge sharing with industry practitioners gives me the ability to make decisions about how my work is done.	①	②	③	④	⑤

4. Management support: To what extent do you feel the University leadership and management are committed to and support knowledge sharing with industry practitioners?

ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1 Our senior leaders have encouraged me to improve knowledge sharing with industry practitioners.	①	②	③	④	⑤
2 Every senior leader stressed the importance of knowledge sharing with industry practitioners.	①	②	③	④	⑤
3 Management has sent a clear signal that this university is going to improve knowledge sharing with industry practitioners.	①	②	③	④	⑤

SECTION C: BEHAVIOR AND ATTITUDE

Derived from the Theory of Planned Behavior (TPB), this section consists of questions related to attitude, subjective norms, perceived behaviour control, intention, behaviors with regarding to academicians/researcher’s knowledge sharing with industry practitioners.

1. Attitude towards knowledge sharing: How positive do you feel regarding sharing knowledge with industry practitioners?

	ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	My knowledge sharing with industry practitioners is an enjoyable experience.	①	②	③	④	⑤
2	My knowledge sharing with industry practitioners is valuable to me.	①	②	③	④	⑤
3	My knowledge sharing with industry practitioners is a wise move.	①	②	③	④	⑤

2. Subjective norms about knowledge sharing: Do you perceive social pressure in order to perform knowledge sharing with industry practitioners?

	ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	My immediate reporting director/head thinks that I should share my knowledge with industry practitioners.	①	②	③	④	⑤
2	My team co-workers think that I should share my knowledge with industry practitioners.	①	②	③	④	⑤
3	My research leaders think that I should share my knowledge with industry practitioners.	①	②	③	④	⑤
4	My senior colleagues think that I should share my knowledge with industry practitioners.	①	②	③	④	⑤
5	My colleagues think that I should share my knowledge with industry practitioners.	①	②	③	④	⑤

3. Perceived Behavior Control (PBC) to knowledge sharing: What is your perception of the ease or difficulty related to performing knowledge sharing with industry practitioners?

	ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	I have the ability to control knowledge sharing with industry practitioners.	①	②	③	④	⑤
2	I have the resources necessary to share knowledge with industry practitioners.	①	②	③	④	⑤
3	Given the resources, opportunities and knowledge, it would be easy for me to share knowledge with industry practitioners.	①	②	③	④	⑤

4. Intention to share knowledge: To what degree do you believe that you will engage in knowledge-sharing activities with industry practitioners?

	ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	I will always share my knowledge with industry practitioners.	①	②	③	④	⑤
2	I will try to share my knowledge with industry practitioners in a more effective way.	①	②	③	④	⑤
3	I will try to share my knowledge with industry practitioners, if it will be helpful to the university.	①	②	③	④	⑤

5. Knowledge sharing: To what degree do you perform knowledge sharing with industry practitioners?

	ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	I frequently share the work reports and official documents obtained with permission from inside the university with industry practitioners.	①	②	③	④	⑤
2	I frequently share my experience or know-how from work with other industry practitioners.	①	②	③	④	⑤
3	I frequently share my expertise from my education or training with industry practitioners.	①	②	③	④	⑤

SECTION D: SUCCESSFUL COLLABORATION

To what degree do you believe that the collaboration with industry practitioners is successful and has contribution to you?

ITEMS	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1	From industrial collaboration I have received significant ideas and knowledge that are further developed as part of my own research activities.				
2	I make intensive use of ideas coming from industry in planning research and development projects.				
3	I get information on industry problems from industrial collaboration.				
4	I get feedback on Industry from industrial collaboration.				
5	I get information on industry research from industrial collaboration.				
6	I become part of network from industrial collaboration.				
7	Industrial collaboration has helped to access non-academic knowledge and information.				
8	Industrial collaboration has a positive effect on the scientific quality and/or impact of my research.				
9	Industrial collaboration has a positive effect on the quality and/or relevance of my teaching.				

APPENDIX C: CONTENT VALIDITY FORM

Dear Respected Expert,

I am a PhD student at the Razak School of Engineering and Advanced Technology, University Teknologi Malaysia (UTM). As part of my doctoral dissertation, I am conducting a research on Readiness of University Academicians towards Knowledge Sharing and Successful Collaboration with Industry Practitioners. At this point I am developing and designing the instrument (surveys). This survey consists of number of variables and items derived from the literature related to the topic of study. In addition, the original and modified items as well as the modification of items for the context of this is shown in this instrument.

I would highly appreciate if you could go through each item of the initial developed survey instrument and give your evaluation which is mainly based on two criteria, relevancy and accuracy. Apart from scoring on relevancy and accuracy, please feel free to leave comment.

I shall take this opportunity to thank you in advance for your cooperation and contribution.

Sincerely,

Muhamet Abdullahu

Email address: muhameti_16@hotmail.com

Supervised by:

1. Dr. Siti Uzairiah Mohd Tobi

Email address: uzairiah.kl@utm.my

SECTION A: READINESS

This research defines ‘Readiness’ as academicians’ state of being ready, motivated and technically capable for sharing knowledge and collaborating with industry practitioners. This section consists of questions related to readiness variables such as: **Efficacy, Appropriateness, Personal valence, Management Support.**

Kindly read below items, which will be used for this research instrument (survey). Kindly comment on items and the adaptability.

Note: In the below table **Original Items:** Represent the items used by other researchers; **Modified Items:** Represent the items which are modified for the context of this study; **Source:** Shows the items’ source.

	Original Scale Item	Modified Items/Additional items	Source
	Efficacy (Variable) <i>Definition:</i> Measures the extent to which respondents feel they are capable of fulfilling the roles and behaviors associated with Knowledge Management (KM) initiatives.	Efficacy Variable definition: <i>Definition:</i> Measures the extent to which respondents feel they are capable of fulfilling the roles and behaviors associated with Knowledge Sharing (KS) initiatives with industry	(Daniel T Holt <i>et al.</i> , 2007; Daniel T Holt & Vardaman, 2013)
2	When we implement such knowledge-sharing changes, I feel I can handle it with ease.	When knowledge sharing is implemented with industry practitioners, I feel I can handle it with ease.	
5	I have the skills that are needed to make such knowledge sharing changes work.	I have skills that are needed to make knowledge sharing work with industry practitioners.	
6	My past experiences make me confident that I will be able to perform successfully after such changes are made.	My past experiences make me confident that I will be able to perform successfully when I share knowledge with industry practitioners.	

Comments: _____

Kindly read below items, which will be used for this research instrument (survey). Kindly comment on items and the adaptability.

2. Appropriateness: To what extent do you feel that knowledge sharing with industry practitioners will benefit the university and address university's needs?

	Original Scale Item	Modified Items/Additional items	Source
	Appropriateness (Variable) Definition: Measures the extent to which respondents feel that KM will benefit the organization and address organizational needs	Appropriateness (Variable) Definition: Measures the extent to which respondents feel that Knowledge sharing with industry practitioners will benefit the organization and address organizational needs.	(Daniel T Holt <i>et al.</i> , 2007; Daniel T Holt & Vardaman, 2013)
2	I think that the organization will benefit from this change.	I think the university will benefit from knowledge sharing with industry practitioners.	
3	Changes to improve knowledge sharing will make my job easier.	Improving knowledge sharing with industry practitioners will make my job easier.	
7	There are a number of rational reasons for such changes to be made.	There are a number of rational reasons to improve knowledge sharing with industry practitioners.	
8	In the long run, I feel it will be worthwhile for me if the organization adopts changes that improve knowledge sharing.	In the long run, I feel it will be worthwhile for me if university improves knowledge sharing with industry practitioners.	

Comments:

Kindly read below items, which will be used for this research instrument (survey). Kindly comment on items and the adaptability.

3. Personal valence: To what extent do you feel that you will benefit from the knowledge sharing with industry practitioners?

	Original Scale Item	Modified Items/Additional items	Source
	Personal Valence (Variable) <i>Definition:</i> Measures the extent to which respondents feel they will benefit from the implementation of KM.	Personal Valence (Variable) <i>Definition:</i> Measures the extent to which respondents feel they will benefit from the implementation of Knowledge Sharing with Industry.	(Daniel T Holt <i>et al.</i> , 2007; Daniel T Holt & Vardaman, 2013)
4	After this change, I expect to be recognized more for the work I do.	After implementing knowledge sharing with industry practitioners, I expect to be recognized more for the work I do.	
5	Such knowledge sharing changes make it easier for me to feel I am part of the team	Improving knowledge sharing with industry practitioners makes it easier for me to feel like I am part of the team.	
6	Such changes give me the ability to make decision about how work is done.	Improving knowledge sharing with industry practitioners gives me the ability to make decisions about how my work is done.	

Comments:

Kindly read below items, which will be used for this research instrument (survey). Kindly comment on items and the adaptability.

4. Management support: To what extent do you feel the University leadership and management are committed to and support knowledge sharing with industry practitioners?

	Original Scale Item	Modified Items/Additional items	Source
	Management support (Variable) <i>Definition:</i> Measures the extent to which respondents feel the organization’s leadership and management are committed to and support the implementation of KM.	Management support (Variable) <i>Definition:</i> Measures the extent to which respondents feel the organization’s leadership and management are committed to and support the implementation of Knowledge Sharing with Industry.	(Daniel T Holt <i>et al.</i> , 2007; Daniel T Holt & Vardaman, 2013)
1	Our senior leaders have encouraged all of us to embrace changes that will improve knowledge sharing	Our senior leaders have encouraged me to improve knowledge sharing with industry practitioners	
3	Every senior manager has stressed the importance of knowledge sharing	Every senior leader stressed the importance of knowledge sharing with industry practitioners.	
6	Management has sent a clear signal this organization is going to make changes that will improve knowledge sharing.	Management has sent a clear signal that this university is going to improve knowledge sharing with industry practitioners.	

Comments: _____

SECTION B: BEHAVIOR AND ATTITUDE

Derived from the Theory of Planned Behavior (TPB), this section consists of questions related to **attitude, subjective norms, perceived behaviour control, intention, behaviors** with regarding to academicians/researcher’s knowledge sharing with industry practitioners.

Kindly read below items, which will be used for this research instrument (survey). Kindly comment on items and the adaptability.

Note: **Original Items:** Represent the items used by other researchers; **Modified Items:** Represent the items which are modified for the context of this study; **Source:**

1. Attitude towards knowledge sharing: How positive do you feel regarding sharing knowledge with industry practitioners?

	Original Scale Item	Modified Items/Additional items	Source
3	My knowledge sharing with other organizational members is an enjoyable experience	My knowledge sharing with industry practitioners is an enjoyable experience.	(Prodromos D. Chatzoglou and Eftichia Vraimaki 2009)
4	My knowledge sharing with other organizational members is valuable to me	My knowledge sharing with industry practitioners is valuable to me.	
5	My knowledge sharing with other organizational members is a wise move	My knowledge sharing with industry practitioners is a wise move.	

Comments:

Kindly read below items, which will be used for this research instrument (survey). Kindly comment on items and the adaptability.

2. Subjective norms about knowledge sharing: Do you perceive social pressure in order to perform the knowledge sharing with industry?

	Original Scale Item	Modified Items/Additional items	Source
3	My immediate supervisor thinks that I should share my knowledge with other members in my CoP	My immediate reporting director/head thinks that I should share my knowledge with industry practitioners.	(Chatzoglou & Vraimaki, 2009; Jeon <i>et al.</i> , 2011b)
4	My team co-workers think that I should share my knowledge with other members in my CoP	My team co-workers think that I should share my knowledge with industry practitioners.	
5	My CoP leaders think that I should share my knowledge with other members in my CoP	My research leaders think that I should share my knowledge with industry practitioners.	
6	My CoP seniors think that I should share my knowledge with other members in my CoP	My senior colleagues think that I should share my knowledge with industry practitioners.	
7	My CoP colleagues think that I should share my knowledge with other members in my CoP	My colleagues think that I should share my knowledge with industry practitioners.	

Comments: _____

Kindly read below items, which will be used for this research instrument (survey), and comment on adaptability of items.

3. Perceived Behavior Control (PBC) to knowledge sharing: What is your perception of the ease or difficulty related to performing the knowledge-sharing with industry colleagues?

	Original Scale Item	Modified Items/Additional items	Source
1	I have the ability to control knowledge sharing in the CoP	I have the ability to control knowledge sharing with industry practitioners.	(Chatzoglou & Vraimaki, 2009; Jeon <i>et al.</i> , 2011b)
2	I have the resources necessary to share knowledge in the CoP.	I have the resources necessary to share knowledge with industry practitioners.	
3	Given the resources, opportunities and knowledge, it would be easy for me to share knowledge in the CoP	Given the resources, opportunities and knowledge, it would be easy for me to share knowledge with industry practitioners.	

Comments:

Kindly read below items, which will be used for this research instrument (survey), and comment on adaptability of items.

4. Intention to share knowledge: To what degree do you believe that you will engage in some knowledge-sharing activities with industry colleagues?

	Original Scale Item	Modified Items/Additional items	Source
1	I will always share my knowledge with my colleagues	I will always share my knowledge with industry practitioners.	(Chatzoglou & Vraimaki, 2009; Jeon <i>et al.</i> , 2011b)
3	I will try to share my knowledge with my colleagues in a more effective way	I will try to share my knowledge with industry practitioners in a more effective way.	
4	I try to share my knowledge with my colleagues if it will be helpful to the organization.	I will try to share my knowledge with industry practitioners if it will be helpful to the university.	

Comments: _____

Kindly read below items, which will be used for this research instrument (survey), and comment on adaptability of items.

5. knowledge sharing: To what degree do you perform knowledge sharing with industry members?

	Original Scale Item	Modified Items/Additional items	Source
1	I frequently share the work reports and official documents obtained from inside the organization with other Community of Practice (CoP) members.	I frequently share the work reports and official documents obtained with permission from inside the university with industry practitioners.	(Jeon <i>et al.</i> , 2011b)
3	I frequently share my experience or know-how from work with other CoP members.	I frequently share my experience or know-how from work with other industry practitioners.	
4	I frequently share my expertise from my education or training with CoP.	I frequently share my expertise from my education or training with industry practitioners.	

Comments: _____

SECTION C: SUCCESSFUL COLLABORATION

Successful collaboration (variable)-This research views successful collaboration from the academicians/researcher’s perspective and at micro or individual level. The items are adopted from sources that address the questions on main reasons why individuals from university collaborate with industry and the benefits they gain.

Kindly read below items, which will be used for this research instrument (survey), and comment on adaptability of items.

Note: **Original Items:** Represent the items used by other researchers; **Modified Items:** Represent the items which are modified for the context of this study.

	Original Scale Item	Modified Items/Additional items	Source
1	From industrial collaboration, our researchers have received significant ideas and knowledge that are further developed as a part of our own research activities	From industrial collaboration I have received significant ideas and knowledge that are further developed as part of my own research activities.	(D’Este & Perkmann, 2011; Reetta <i>et al.</i> , 2015)
2	Researchers and students make intensive use of ideas coming from industry in planning research and development projects	I make intensive use of ideas coming from industry in planning research and development projects.	
3	Information on industry problems	I get information on industry problems from industrial collaboration	
4	Feedback from industry	I get feedback on Industry from industrial collaboration.	
5	Information on industry research	I get information on industry research from industrial collaboration.	
6	Becoming part of network	I become part of network from industrial collaboration.	
8	Access non-academic knowledge and information	Industrial collaboration has helped to access non-academic knowledge and information.	
9	It has a positive effect on the quality and/or relevance of my teaching	Industrial collaboration has a positive effect on the scientific quality and/or impact of my research.	
11	Improve my chances of academic advancement	Industrial collaboration has a positive effect on the quality and/or relevance of my teaching.	

Comments: _____

APPENDIX D: EXPERT'S ACCEPTANCE FOR INSTRUMENT VALIDATION

2/11/2019 Mail - muhamet abdu... - Outlook

Outlook Search All folders 🔍 ⚙️ 📧 ? 🌐

+ New message Reply ↩ Delete 🗑 Archive 📁 Junk 🗑 Move to 📁 Categorize 🏷 ...

Inbox 718

Junk Email 30

Drafts 9

Sent Items

Deleted Items

Archive

Boxbe Waiting ... 11

Conversation Hist...

METI 1

meti26@outlook.c...

New folder

Results

Top results

ZABEDA BT. ABDUL HAMID .
 Re: Regarding my Phd s... 11/27/2016
 Salam Muhamet, I've had a lo... Inbox

Pilot Survey Uni... +1

ZABEDA BT. ABDUL HAMID .
 Re: Original items of the... 11/29/2016
 Salam Muhamet, I've attached ... Inbox

Facebook
 Mohammad Mohiuddin... 3/1/2017
 This message is eligible for Au... Inbox

All results

Facebook
 Mohammad Mohiuddin... 3/1/2017
 This message is eligible for Au... Inbox

IUM GSM
 Mr. Paul J. Corney, Kno... 2/17/2017
 Assalamu'alaikum wrt. wbt. an... Inbox

Brochure knowl... 2 MB +1

**muhamet abdu...
 Fw: Latest Updated Pilot... 12/1/2016
 No preview is available. Sent Items**

Pilot Surevey U... +7

**muhamet abdu...
 Latest Updated Pilot Sur... 11/30/2016
 Salam Dr. Siti and Dr. Masl... Sent Items**

ZABEDA BT. ABDUL HAMID .
 Re: Original items of the... 11/29/2016
 Noted. Good luck and may ev... Inbox

**muhamet abdu...
 Re: Original items of the... 11/29/2016
 W.A.Salam Madam Zabed... Sent Items**

**muhamet abdu...
 Fw: Original items of th... 11/29/2016
 FYI Salam Dr.Siti and Dr.M... Sent Items**

Expert 1 feedba... +2

ZABEDA BT. ABDUL HAMID .
 Re: Original items of the... 11/29/2016
 Salam Muhamet, I've attached ... Inbox

**muhamet abdu...
 Original items of the sur... 11/29/2016
 Salam Madam Zabeda, I h... Sent Items**

Re: Regarding my Phd survey questions. Kindly pro...

ZABEDA BT. ABDUL HAMID . <zabeda@ium.edu.my>
 Sun 11/27/2016 5:26 PM
 You 📧

Pilot Survey University - e...
 301 KB

Download Save to OneDrive

Salam Muhamet,

I've had a look at the survey questions. I've switched item 6 and 7 around so that it makes more sense.

You also use the words 'organizations' and 'university' interchangeably. It can cause a confusion so better to stick to 'university' since you're asking the academicians about their experience with the university.

I also don't understand this line that describes this section:
PBC to knowledge sharing

What is your perception of the ease or difficulty related to performing the knowledge-sharing industry colleagues?

Should it be: What is your perception of the ease or difficulty related to performing knowledge sharing with industry colleagues?

I've attached the edited file with this email.

Wassalam,

Zabeda

Asst. Prof. Dr. Zabeda Abdul Hamid
 Department of Business Administration
 Kulliyyah of Economics and Management Sciences
 International Islamic University Malaysia
 PO Box 10, 50728 Kuala Lumpur, Malaysia
 Tel: +603-6196 4741
 Fax: +603-6196 4644

On 25 November 2016 at 16:48, ZABEDA BT. ABDUL HAMID . <zabeda@ium.edu.my> wrote:
 Thanks Muhamet. I'll have a look at it this weekend.

Asst. Prof. Dr. Zabeda Abdul Hamid

Outlook Fariza Hanim Rusly All folders

+ New message Reply Delete Archive Junk Move to Categorize

Results

Top results

- Dr. Fariza Hanim binti Rusly
RE: AssalamuAlaikum Siste... 9/21/2015
Waalaikumsalam Mr. Muhamet, ... [Inbox](#)
- Dr. Fariza Hanim binti Rusly
Re: Regarding survey quest... 12/4/2016
Assalamua'laikum, Kindly refer to ... [Inbox](#)

[Original Items a...](#)

All results

- muhamet abduallahu
Re: Regarding survey quest... 12/5/2016
W.A.Salam, Thank you very m... [Sent Items](#)
- Dr. Fariza Hanim binti Rusly
Re: Regarding survey quest... 12/4/2016
Assalamua'laikum, Kindly refer to ... [Inbox](#)

[Original Items a...](#)

- muhamet abduallahu
RE: AssalamuAlaikum Siste... 5/31/2016
SalamAlaikum Dr Fariza, I hav... [Sent Items](#)
- Dr. Fariza Hanim binti Rusly
RE: AssalamuAlaikum Siste... 9/21/2015
Waalaikumsalam Mr. Muhamet, ... [Inbox](#)

Re: Regarding survey questions items. Kindly provi...

Dr. Fariza Hanim binti Rusly <hanim@uum.edu.my>
Sun 12/4/2016, 1:46 AM
You

[Original Items and Modifi...](#)
54 KB

[Download](#) [Save to OneDrive](#)

Assalamua'laikum,

Kindly refer to the attached file for my comments and reviews. Not much, but hopefully could be considered for improvement. All the best and May Allah ease your journey.

Kind regards,
Fariza

FARIZA HANIM RUSLY, PhD
Senior Lecturer
Tunku Puteri Intan Safinaz School of Accountancy (TISSA-UUM)
College of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah, MALAYSIA.
O: +6049287240
M: +60195593835
Google Scholar: <https://scholar.google.com/citations?user=yW8T8gwAAA&hl=en>
Research Gate: https://www.researchgate.net/profile/Fariza_H_Rusly

From: muhamet abduallahu <muhameti_16@hotmail.com>
Sent: Tuesday, November 29, 2016 1:34 PM
To: Dr. Fariza Hanim binti Rusly
Subject: Re: Regarding survey questions items. Kindly provide a feedback on items.

Salam Dr. Fariza,

Please refer to attached file of this email "Original Items and Modified Ones".

I adopted (Danier T.holt 2007) Readiness variables and items. I would highly appreciate if you could give a feedback on the modification of items for the context of my study. Is this modification still rational/acceptable as per your understanding?

Please do provide feedback on expert's section as I need to show your feedback on instrument design chapter of my thesis.

If you want to see only the surveys, kindly refer to my previous email files in the same thread.

W.A.Salam,
Muhamet Abdullahu
+6018-392 0961

Upgrade to Office 365 with premium Outlook features

- Inbox 711
- Junk Email 19
- Drafts 8
- Sent Items
- Deleted Items
- Archive
- Boxbe Waiting ... 11
- Conversation Hist...
- METI 1
- meti26@outlook.c...
- New folder

Results

- Top results**
- MA MUHAMET ABDULLAHI Dahlan 2/5/2014
No preview is available. Inbox
 - ABDUL RAHMAN BIN AHMAD DAHLI
RE: Regarding my surve... 12/2/2016
Salam Br Muhamet, As discuss... Inbox

Muhamet_Pilot... +2
 - ABDUL RAHMAN BIN AHMAD DAHLI
RE: AsalamAlaikum 3/18/2014
Salam Br Muhamet, Please co... Inbox
- All results**
- MS Mohammad Shuaib 5/20/2018
Fwd: Draft Thesis
Salam, Here you Go. Forwarde... Inbox

Thesis 16_04_20...
 - ABDUL RAHMAN BIN AHMAD DAHLI
RE: Regarding my surve... 12/2/2016
Salam Br Muhamet, As discuss... Inbox

Muhamet_Pilot... +2
 - J Jamal 12/2/2016
Re: Regarding my surve...
Ok I will be meeting my stude... Inbox
 - muhamet abdullahu 12/2/2016
Re: Regarding my surve...
Salam Prof Jamal, Maybe i... Sent Items
 - J Jamal 12/1/2016
Re: Regarding my surve...
Sorry, I don't quite understand... Inbox
 - muhamet abdullahu 12/1/2016
Re: Regarding my surve...
Salamalaikum Prof. Dahla... Sent Items

Pilot Surevey U... +3
 - muhamet abdullahu 11/25/2016
Regarding my survey qu...
Salamalaikum Prof. Dahla... Sent Items

Pilot Surevey U... +3
 - muhamet abdullahu 3/23/2015
FW: CV
No preview is available. Sent Items

RE: Regarding my survey questions design. Kindly ...

ABDUL RAHMAN BIN AHM AD DAHLAN <arad@iium.edu.my>
Fri 12/2/2016 8:45 AM
You; jamal55@gmail...

Muhamet_PilotSurveyUni...
166 KB

Download Save to OneDrive

Salam Br Muhamet,

As discussed briefly and feedback as attached.

Thank you. Wassalam.

From: muhamet abdullahu [mailto:muhameti_16@hotmail.com]
Sent: Thursday, December 01, 2016 3:03 PM
To: arad@iium.edu.my; jamal55@gmail.com
Subject: Re: Regarding my survey questions design. Kindly provide a feedback on items.

Salamalaikum Prof. Dahlan and Jamal.

Kindly refer to the latest updated files. Two files attached as follows:

1. Pilot Survey Industry
2. Original Items and modified ones. *(Kindly provide feedback on expert's comment space)*

I hope you can go through my surveys and give your valuable feedback.

Hope to hearing from you soon.

Regards,
Muhamet Abdulahu

From: muhamet abdullahu <muhameti_16@hotmail.com>
Sent: Friday, November 25, 2016 9:29 AM
To: arad@iium.edu.my; jamal55@gmail.com
Subject: Regarding my survey questions design. Kindly provide a feedback on items.

Salamalaikum Prof. Dahlan and Jamal,

It was very good meeting you at your office prof. Dahlan.

As part of my doctoral dissertation, I am conducting a research on "Readiness of University Academicians towards Knowledge Sharing and Collaboration with Industry Practitioners". I am designing the instrument (surveys).

I would highly appreciate if you could go through my survey items, the original and modified ones and see if the modification of items for the context of this study is rational as per your understanding.

Kindly find two attached files.