

THE INFLUENCE OF LECTURERS COMMITMENT ON RESEARCH AND COMMERCIALIZATION THAT SUPPORT NATIONAL SCIENCE AND TECHNOLOGY POLICY

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Abstract : *Research and development implementation are an important agenda in strengthening the brand and ranking for institutions of higher learning in Malaysia. Advantages of implementing researches is clear and concise, but the commitment in practicing among university lecturer are still low. This study involved lectures from several universities in the northern region. A total of 200 respondents were involved in this study. Lecturers were randomly selected from multi discipline area of expertise to avoid any informed decision. Quantitative approach was applied through questionnaire provided and then analysed systematically to determine the effect to the study. In a nutshell, the results of the data analysis prove that commitment of lecturer's have a significant relationship towards research and commercialization compliment. Further recommendation and suggestion are given at the end of articles.*

Keywords: *Commitment, Research, Commercialization, National Policy on Science and Technology*

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1.0 Introduction

The original focus of our National Science and Technology Policy Tier 1 is to increase research and commercialization activities in Malaysia. Institution of Higher Education is the target agencies that can support this agenda when it was launching on 1986. Universiti Teknologi Malaysia headed this policy dimension by highlighting four tools to measure research and commercialization incentive which are the number of patents, trademark, product commercialization and R&D potential.

The various initiatives and programmes that were implemented under these policies, including the enhancement of national capabilities and capacities of Research and Development (R&D), the forging of partnerships between public funded research organisations and industries, enhancement of commercialisation through National Innovation Model, and development of new knowledge-based industries, have accelerated the advancement of country's STI.

Table 1: University Research Commercialisation until August 2008

Universities	Patent	Trade mark	Total Commercialised Products	Total R&D with Potential for Commercialised Products	Total No. of IP
Universiti Teknologi Malaysia (UTM)	9	28	6	110	153
Universiti Putra Malaysia (UPM)	12	27	16	15	70
Universiti Kebangsaan Malaysia (UKM)	3	20	0	33	56
Universiti Malaya (UM)	0	11	3	31	45
Universiti Sains Malaysia (USM)	11	4	15	9	39
Universiti Teknologi Mara (UiTM)	5	22	8	0	35
Universiti Malaysia Pahang (UMP)	0	0	1	29	30
Universiti Malaysia Sabah (UMS)	0	0	0	26	26
Universiti Utara Malaysia (UUM)	0	0	0	21	21
Universiti Tun Hussein Onn Malaysia (UTHM)	0	0	3	16	19
Universiti Malaysia Sarawak (UNIMAS)	0	8	0	4	12
Universiti Islam Antarabangsa Malaysia (UIAM)	0	2	2	4	8
Universiti Pendidikan Sultan Idris (UPSI)	0	0	0	8	8
Universiti Malaysia Terengganu (UMT)	0	0	2	4	6
Universiti Malaysia Perlis (UniMAP)	0	0	2	3	5
Universiti Teknikal Malaysia Melaka (UTEM)	0	0	0	0	0
Total	40	122	58	313	533

(Source: MOHE)

Table 2: 10th Malaysia Plan Ministry of Higher Education R&D Schemes

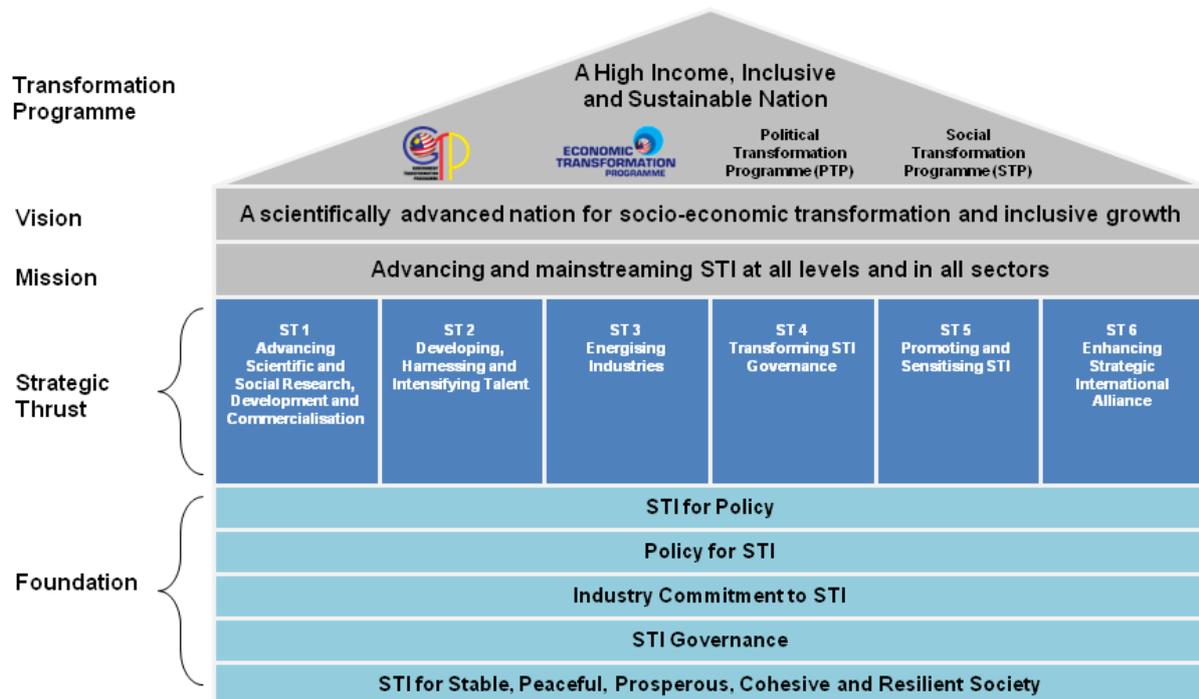
		No. Scheme Allocation (2011 – 2012)
1	Fundamental Research Grant Scheme (FRGS)	300 million
2	a. Exploratory Research Grant Scheme (ERGS) b. Long-Term Research Grant Scheme (LRGS) c. Prototype Research Grant Scheme (PRGS)	300 million
3	Research Incentive	41 million
4	MOHE Special Project	100 million
	TOTAL	741 million

(Source:MOHE)

The 10th Malaysia Plan by Ministry of Higher Education clearly describe the allocation of financial assistant for research grant which bring an amount of 741 million for year 2011 to 2012. The government policy on research and commercialization encouragement scheme are very serious and always become a priority in education development. It is up to university management on how to grab this opportunity to fight for this budget allocation.

The above table highlight the five criteria in measuring the achievement of NPST among universities in Malaysia. Universiti Teknologi Malaysia heading the achievement by getting the highest score in the total of Research and Development and commercialization of R&D product in the nation. Base on the data on 2008, the achievement of universities is inconsistent and this situation gives an evident that the achievement of NPST through the involvement of academic staff still at the critical stages.

Figure 1: Framework for the National Policy on Science, Technology and Innovation (NPSTI)



The framework for NPST consist of six strategic thrust as the basis for supporting the mission and mission of the transformation programme. The above figure shows that the aims of the policy is to achieve a high income, inclusive and sustainable nation through social transformation, political transformation, economic and lastly technology transfer. Out of six strategic trust that support the vision and mission, this research only focusses on strategic trust no 1 which stress on advancing Scientific and social research, development and commercialization. In short, this research only focusses on the possible factors that contribute to strategic trust 1 which are measured by the achievement of academic lecturers in research and commercialization compliment inline to the NPST vision.

The achievement of this Key Performance Indexed (KPI) is measured by the numbers of patent, trademark and commercialization of the product which released from the output of the complete research project. Generally, the increment numbers of patent, trademark by university are inline to the numbers of research completed by the academic staff. However, there are too many barriers for them to complete any single research every semester. The numbers of completed research are depending on the numbers and duration of research grant successfully awarded to university lecturers. The issue is whether the university lecturers have a capability

in winning the research grant every semester or academic year along their services. There are many limitations for them to win the research grant especially the staff holding the administration post in university. Beside that the limitation on the numbers of grant that offers by the ministry also effect on the number of researches in university. Hence the lecturers teaching loading that covers face to face classroom appointment, online monitoring and student evaluation may cause the life of lecturer more fatigue and stress. At the same time, the difference group age of lecturers and their length of service, seniority might contribute to individual effort of lecturer's on research and commercialization work as a hole.

Hence the awareness and commitment of the lecturers as the main player in the university are important in complying with research and commercialization as line up in the NSTP policy. The inconsistent achievement of universities in research and commercialization as shown in the table has confirmed the missing link between this NSTP policy and university focus towards the policy. Ministry of Higher Education has formally categorized our university into three mainstream which are teaching university, research university and moderate categories.

This paper will present more generous scenario on the antecedent of awareness, commitment on lecturer's workload and its impact on NSTP achievement by measuring the emotional perception of individual lecturers on research and commercialization activities. Previous study has empirically identified the problems that contributed to low commercialisation rates of R&D in the Malaysian universities from the industrial perspective. Further studies should be conducted to enhance the results and make it more representative (Ali, Leman, Sunar, & Ahmad (2017). Previous study suggests that future research can explore the concept of university commercialization in different context (Rasyid, 2015).

2.0 Literature Review

2.1 Research and Commercialization among University Lecturers

Recently, in the 11th Malaysia Plan, the government had stressed on increasing the number of quality graduates; and strengthening research for innovation as part of promoting commercialisation activities. Rationally the increasing numbers of the postgraduate student will increase the numbers of findings or new model that applicable for industrial usage. Instead of that, the encouragement of ministry for university to set up the partnership program indirectly will increase the research and collaboration network. To achieve this, the universities are encouraged to partner with industry, government, and local communities to incubate, develop, and commercialise their ideas. The universities are also encouraged to set up a Technology Transfer Office (TTO) to manage and support the commercialisation activities of the research outputs (Decter & Bennett, 2003).

The government has launching a list of research grant for universities to increase lecturer's involvement in research and commercialization. Although much emphasises and encouragement have been put forward to accelerate research products commercialisation related activities, however, commercialisation of research products especially among academics in Malaysia is less progressing and encouraging. According to Collier and Gray (2010), "commercialisation is often characterised as the „third mission"". Researchers in the universities produce innovations as a result of their research activities which in turn can be exploited commercially. We can have concluded that research work is the prerequisite for

commercialization of the product by university. Therefore, there is a significant relationship between research and commercialization activities. However, the transformation from research and development into commercialisation is a path strewn with many pitfalls (Aziz, Haris and Norhashim, 2011). The commercialisation and innovation development has been assigned as „Niche 1“ by the Malaysian Ministry of Higher Education which implies the emphasis and urgency (MOHE, 2010) under the Tenth Malaysian Plan. As been discussed in the introduction, there is a possible effect of the numbers of research grant and the numbers of patent, trademark and innovation registered by each university in Malaysia. This study only focusses on the selected variable as the determinant of research and commercialization activities among university lecturers. From the reviewing of literatures there is lack of study investigating the possible factors that contribute to research and commercialization intensity by lecturers.

Previous study by Heng, Rasly and Senin (2011) investigate main factors affecting commercialization, they found that academic researchers who perceive the engagement of commercialization activities as feasible are more likely to commercialize their innovations. Once paired with the right person, the key researcher became more confident and is willing to go the extra mile of having his research commercialized. This finding shows that the research partners might give more influence on commercialization decision by the main investigator. Teamwork can be one of the determinants for research and commercialization. Work as a team will open to more idea and awareness level of the researcher.

Human studies has concluded that individual behaviour most probably influence their confident and ability in doing things. Teamwork will increase personal confident in term of their action and decision in practising academic research as part of their job responsible along their appointment as academician. Therefore, teamwork factor might contribute to research culture among lecturers in university. Thus, self-efficacy influences not only our choice of action but also the sum of our effort. Research on team efforts also found that a team's belief about their collective abilities and effectiveness to execute a series of actions to yield a certain level of acceptable performances had the same influence as individual self-efficacy (Shepherd and Krueger, 2002). Rashid (2015) study the influence of leadership style of university leaders towards commercialization of research, the findings revealed a direct relationship of transformational and transactional leadership styles with commercialization of academic research. In addition, entrepreneurial orientation has significant influence on the commercialization of academic research. Previous research has investigated the variety of variables as the determinant of the research and commercialization activities by lecturers. It is indicating that research and commercialization issues are very significant nowadays, since the most university looking forward to get international certification and world ranking.

Ali, Leman, Sunar, & Ahmad (2017) has identified the problems related to low commercialisation rates empirically and to gather information on how to increase the commercialisation rates in Malaysian universities from the industrial perspective. The found that the factors contribute to low commercialization are industry culture and motivation; mismatch university R&D; funding; and communication and networks.

Commitment of Lecturer's on Research and Commercialization

The concept of the organizational commitment is concerned with the degree to which people are involved with their organizations and are interested in remaining with them. The

commitment of the employees to the organization is referred as organizational commitment. The stereotypical view of commitment is that it reflects the loyalty and willingness to work towards organizational objectives. Hence the awareness of employees to give their effort on the management order and policy are the features of employee commitment towards organization. Organizational commitment is a psychological state that characterizes the employee's relationship with the organization and has implications for the decision to continue membership in the organizations (Meyer and Allen, 1991, pp. 67). Sense of ownership is compulsory for the employees in order to comply to the most current demand of management.

Organizational commitment of employees is not only matter of "yes" or "no" or even how much, distinctions can also have been made in relation to the kind of commitment employees have. Meyer and Allen (1991) add that the three component Model of Commitment was espoused were Affective, Continuance and Normative Commitment. This research proposed commitment as one of the determinants of research and commercialization activities among university lecturers. Rationally, without commitment by the staff, it is difficult for organization to move forward to support government and ministry policies from time to time. organizational commitment is perceived to have relatively greater impact on job performance than job satisfaction (Ming, 2009). Universities' income from academic engagement is usually a high multiple of the income derived from intellectual property (Perkmann et al., 2011). Intellectual property is part of commercialization as defined by literature that related to patent and trademark. Alternatively, a patented or otherwise protected invention may be licensed out against the contracted receipt of royalties (Jensen and Thursby, 2001). Patenting represents a preliminary step, indicating a disposition on the part of the academic towards some kind commercialisation. Both academic engagement and commercialisation tend to be individually commitment and pursued on a discretionary basis. Universities are 'professional bureaucracies' with highly skilled professionals to reach their organisational goals. To main reason of lecturers to commit and engage in collaboration with industry still unclear, so far there is an evident that this movement is more on individual initiatives rather than organization push factors. In term of data collection whereas a first issue regards the lack of longitudinal data that comply with a long duration data collection. In fact, all largescale survey-based studies are based on cross-sectional data and therefore pose limitations in terms of inferring causal relationships between variables. For instance, it is unclear whether individual research performance is enhanced by academic commitment, or commitment is a mere consequence of high research performance (Perkmann et al., 2013). Therefore, this research investigates the role of lecturer's commitment in research and commercialization activities. The consequence of research and commercialization will lead to the evaluation of success of achieving NPST policy that established by the ministry since 2012. Lack of data for a comprehensive and informed overview of the role of higher institution education in commercialization of research and the main challenges they face (Ghacie, 2017).

3.0 RESEARCH METHODOLOGY

3.1 Research Design

According to Sekaran (2011), research design is referring to the either qualitative or quantitative nature of research. Roughly qualitative research means the data for the research is collected through questionnaire and qualitative research gathered the data from interview, observation, article review or experimental process. But this research represents a quantitative type of research whereas data is gathered through a set of questionnaires distributed to the respondents.

3.2 Population of The Studies

This study focus is to investigate the impact of few variables toward the achievement of National Policy on Science and Technology in Malaysia (Tier 1) that stress on research and commercialisation achievement among universities. Since all four main universities in the northern region involve in this study, the population are all the lecturer's in Universiti Sains Malaysia, Universiti Utara Malaysia, Universiti Malaysia Perlis and last but not least Universiti Teknologi MARA. The numbers of population are up to 2000 lecturers from these four universities.

3.3 Sampling Design

Sampling is the process of selecting the respondent to answer the questionnaires. According to Sekaran (2001), the sampling design for the numbers of population that we know their numbers is call probability sampling. But if the numbers of population is unknown, the sampling design is call non probability sampling. Therefore, since we know the numbers of the population this study will consider probability sampling as the nature sampling design.

Base on probability sampling design, this study considers stratified sampling as a sampling method. According to literature, stratified sampling method will open to the situation where equal numbers of respondent to be selected as respondent that represent each cluster of population. In this case, equal numbers of respondents will be selected from each university. The table below shows the stratified numbers of respondent from each universities. The numbers of sample are determining by Krejcie and Morgan (1970) table. From the table, for 2100 population the sample size is 325 respondents.

Institution	Sample	Cumulative
UUM	$1000/5000 \times 357 = 71$	71
UiTM	$1500/5000 \times 357 = 107$	178
UNIMAP	$1000/5000 \times 357 = 71$	249
USM	$1500/5000 \times 357 = 107$	356

4.0 Data Analysis and Finding.

4.1 Response Rate

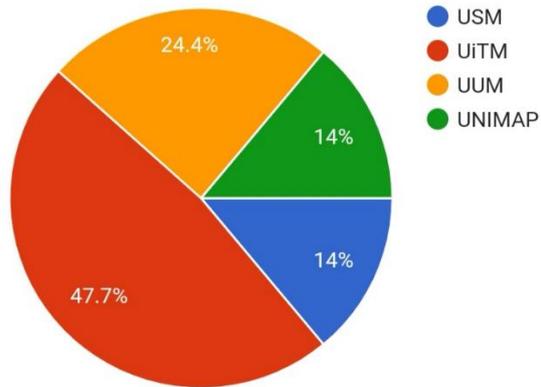
Out of 200 questionnaires distributed for this phase one – pilot survey, it is only 86 set of questionnaires are return. Therefore, the response rate for this study is 43%. According to research methodology literatures, 43% response rate are accepted for population generalization because it is above acceptance level which is 30%.

4.2 Descriptive Analysis - Demographic Profile of Respondent

4.1.1 Universities

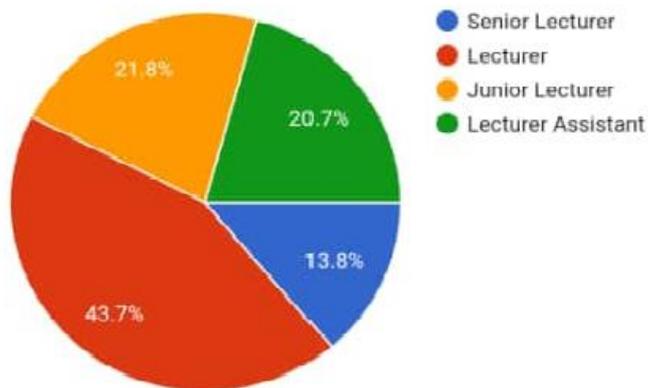
As been mentioned in the methodology, four universities are involved in this short period survey which are Universiti Science Malaysia, Universiti Utara Malaysia, Universiti Utara Malaysia and Universiti Malaysia Perlis. The response of university lecturers are shown below;

86 responses



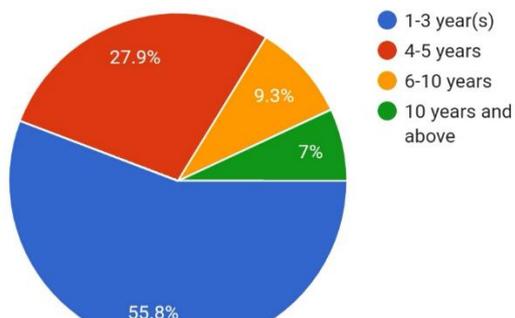
4.1.2 Job Categories

The above chart shows that 38(44%) of respondents are lecturers, 19(22%) are junior lecturers, 17 (21%) are assistant lecturers and 12(14%) are senior lecturers involved in this study.



4.2.3 Years of Experience

86 responses



In term of years of experience, 48(55%) of respondents are less than 1-3 years of working experience, 24(28%) are between 4-5 years of working experience, 7(9%) between 6 to 10 years and 6(7%) are above 10 years of working experience.

4.3 Regression Analysis

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.778 ^a	.605	.600		.38461

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.012	1	19.012	128.522	.000 ^a
	Residual	12.426	84	.148		
	Total	31.437	85			

a. Predictors: (Constant), Min_Commitment

b. Dependent Variable: Min_NPST

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.872	.273		3.197	.002
	Min_Commitment	.760	.067	.778	11.337	.000

a. Dependent Variable: Min_NPST

The above table shows that p value for relationship between commitment and research and commercialization is 0.000 which is below 0.05. According to Palant (2001) the value shows a significant relationship between the two variables. This finding are similar to the previous finding by Bandula and Jayatilake (2016) concluded that employee commitment has significantly impacted on job performance which means the employees totally perform all the job order. Similarly, the positive response of lecturers on the management order is the features of performance as summarize by many literatures in academic journal.

4.4 Discussion

In many situations the commitment of employees is important criteria in justifying the readiness of organization toward internationalization. Similarly, this study showing an empirical evident that the lecturers must committed towards the direction of university in order to upgrade the university in the world ranking. The effort taken by university management are now very aggressive inline to ministry and our country vision to increase international admission in Malaysian universities. By looking at the demographical factor of respondent, roughly most of them are young and less than five years working experience. According to the theory, young age employees are more productive compared to elder generation.

4.5 Conclusion

This study confirms the significant influence of lecturer's commitment on research and commercialization achievement. Rationally the participation of lecturers in research and commercialization contribute a high MyRA score achievement by university. Since the awareness of ministry towards internationalization and international certification, double degree initiatives and industrial linkages the involvement of academic staff in research indirectly increased quietly.

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