

## ACADEMIC ENTREPRENEURSHIP INTENTION: A CASE STUDY OF A MALAYSIAN UNIVERSITY

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### ABSTRACT

The 11th Malaysia Plan (2016 – 2020) was unveiled by the Prime Minister in May 2015. Thus, it is high time to investigate for signs of realisation of 10th Malaysia Plan's commercialisation and innovation development among Malaysian universities initiative. It is proposed that one way of achieving this is by investigating the level of entrepreneurial intention among researchers in Malaysian universities. This paper reports findings from a study conducted in one Malaysian university. A total of 65 researchers undertaking postgraduate work (Masters and Doctoral) took part in the study over a period of five months. In general the group shows moderate levels of self-efficacy, perceived feasibility and entrepreneurial intention. Around 35% of the group recorded high levels of entrepreneurial intention. However, intention to commercialize their research specifically, a significantly lower level was observed. The paper makes recommendations on how universities can better drive academic entrepreneurship.

**Keywords:** academic entrepreneurship, commercialisation, intention, researchers

### INTRODUCTION

Abreu and Grinevich (2013) define 'academic entrepreneurship' as the effort to increase the influence, prestige, or profits of individuals or institutions through the development and marketing of research ideas and research-based products. They explain that academic entrepreneurship enhances societal well-being and results in organizational improvements as well as increased financial rewards for the academic entrepreneur. Their research argues that academics' potential for research commercialization is dependent upon their academic disciplines, types of knowledge produced, and the extent to which their work can enjoy intellectual property (IP) protection such as through patents. For example, spinouts are relevant for commercialization of research in the life sciences due to the nature of inventions and long product development duration while research outputs in the social sciences are more often in the form of consultancy and contract research.

In addition to the arguments on 'academic entrepreneurship' put forth by Abreu and Grinevich (2013), Perkmann et al. (2013) refer to another term, namely 'academic engagement' which also addresses the issue of commercialization of academic research. They define 'academic engagement' as collaborations between academic researchers and non-academic entities which are knowledge-related. It includes more formalized activities such as consulting, joint research, and contract research. It also includes informal activities such as providing advice and networking with industry professionals. Perkmann et al. (2013) also highlight research findings on the fact that transfer of knowledge via academic engagement is perceived more valuable by companies compared to the licensing of university patents, and that universities' income from it is usually much higher than those derived from intellectual property.

Malaysia is still behind in terms of its research capabilities as evidenced by various rankings. In the OECD Science, Technology and Industry Outlook 2014 report, Malaysia ranked in the bottom half of OECD on all 3 measures for universities and public research performance (OECD, 2014). In the 10th Malaysia Plan, commercialisation and innovation

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development was assigned as ‘Niche 1’ by the Malaysian Ministry of Higher Education (MOHE 2010). There are a number of funds, grants and incentives made available by the government to enable innovation and business creation among the universities. It was reported that under the 9th Malaysia Plan (2006 – 2010), the Malaysian government invested a total of RM3.2 billion in the form of R&D grants. Meanwhile, under the 10th Malaysia Plan (2011 – 2015), the government allocated RM840 million for the same purpose.

The main R&D schemes under the administration of the Ministry of Higher Education are the Fundamental Research Grant Scheme (FRGS), Exploratory Research Grant Scheme (ERGS), Long-term Research Grant Scheme (LRGS) and Prototype Research Grant Scheme (PRGS). Prior to 10th Malaysia Plan the Ministry only had one R&D grant scheme, the FRGS. The introduction of ERGS, LRGS and PRGS, reflects the government’s desire to enhance the research, development and commercialisation activities among the universities. The three new schemes bridge the gap between university R&D activities and the programmes in place to drive commercialisation and business creation.

In terms of the development of commercialisation efforts in the Malaysian higher education sector, the trend had been: I) establishment of private universities, II) establishment of consultancy centres, III) emphasising research - identification of research agenda, creation of “Research University” and “Apex University” status for the public universities and the establishment of research management centres, and IV) emphasising research commercialisation – this was seen more from government agenda such as the RM 191.5 billion budget announced for 2010 with the aim to create an economy based on innovation, the more recent target to commercialise 360 high impact R&D products by the year 2020; all which universities researchers are one of the key success factors.

However, in a previous study, (Ab. Aziz et al., 2013) found that research commercialisation achievement by researchers in Malaysian universities were low. It was clear that there is a need to address the situation and drive the universities to a better performance level. It is the belief of this paper that one the key factor that can lead to the desired performance levels among the researchers in Malaysian universities in terms of research commercialization is to instil high level of entrepreneurial intention among them.

Previous researchers have suggested entrepreneurial intention-based models as the most practical insight to planned behavior. The entrepreneurial intention-based models are of Ajzen’s 1991 Theory of Planned Behaviour (TPB) and Shapero and Sokol’s 1982 model of the Entrepreneurial Event (SEE). Both TPB and SEE contained the element of self-efficacy. Perceived self-efficacy is the perceived behavioral control in TPB and perceived feasibility in SEE. According to Krueger, Reilly and Carsrud (2000) promoting entrepreneurial intentions requires promoting perceptions of both feasibility and desirability; the belief of self – capabilities to control own’s motivation, behavior and social environment. Linan, Nabi and Krueger (2013) improved prior research by adding the role of culture along with motivations, skills and knowledge of the entrepreneurial environment. Culture is defined as a set of shared beliefs, values and expectations (Hayton, George and Zahra, 2002). There are two ways how culture influence entrepreneurship; bottom up versus top down. The first way or the aggregate trait suggests that entrepreneurial values and traits increase if more individuals of a country become entrepreneurs. The second way or the societal legitimization suggests that a higher level of moral approval of entrepreneurship within a culture is reflected in that society’s practices (Stephan, 2008). The higher the level of knowledge and awareness about entrepreneurship will increase self-efficacy perceptions and hence entrepreneurial intentions.

## **RESEARCH DESIGN**

This study comprised of several stages. First a group of 65 academic researchers (Master and PhD candidates) were solicited to take part in the study. Their entrepreneurial potential was

gauged via a survey. Next, the group was given an exposure to research commercialisation and entrepreneurship via a seminar and supporting material which was made accessible to them via online throughout the study. Then, each researcher was asked to review their ongoing research work and evaluate its commercial potential and their intention to commercialise their work upon completion. Those that recorded high entrepreneurial intention in the survey were asked to provide further elaboration on their assessment and intention to commercialise. The findings are presented in the following sections.

## FINDINGS

A total of 65 academic researchers took part in the study. Among them, 46 (70.8%) were males while the remaining 19 (29.2%) were females. The age ranged from 21 to 54 years old, with the mean age at 31.52 years. Out of the 65, 35 (53.8%) were Master candidates, and 30 (46.2%) were PhD candidates. 48 (73.8%) of them were enrolled as full time candidates, while the rest, 17 (26.2%) were enrolled as part time candidates at the university. Out of the 65, 34 (52.3%) were also member of staff of the university. In terms of research fields, 22 (33.8%) were working in the Social Sciences and Humanities, 33 (50.8%) in Science and Technology, and the remainder 10 (15.4%) were in the field of Creative Multimedia.

Reliability analysis was conducted to determine the internal reliability of the items used to measure the constructs tested in this study. According to Sekaran (2000), Cronbach's Alpha is a reliability coefficient that indicates the extent to which the items are positively correlated to one another. Cronbach's Alpha greater than 0.80 is deemed as good (Sekaran, 2000). All of the constructs were considered as reliable and good as the Cronbach's Alpha were above 0.80 (see Table I).

A total of 18 items were used to measure the main constructs of the study, namely EI (8 items), SE (7 items), and PF (3 items). The items were measured by itemized rating scale with seven scale categories, ranging from 1 = "Strongly Disagree" to 7 = "Strongly Agree". Mean analysis was conducted to determine the average mean of the constructs. Overall, the respondents were agreed with all the items measuring the constructs with SE achieved the highest level of agreement with an average mean of 4.954, median of 5.000 and with the mode at 6.286; while PF scored the lowest level of agreement with an average mean of 4.354, median of 4.333 and with the mode at 5.000. Meanwhile, EI achieved a mean of 4.813, median at 5.250 and the mode 6.000. Notably, majority of the respondents rated a high level of agreement on EI, suggesting that the target users shown good indication of intending to undertake entrepreneurial activity in the future.

**Table I: Reliability Analysis**

Constructs	N	Mean	Std. Dev.	Cronbach's Alpha	No. of Items
Entrepreneurial Intention (EI)	65	4.813	1.635	0.972	8
Self - Efficacy (SE)	65	4.954	1.131	0.906	7
Perceived Feasibility (PF)	65	4.354	1.388	0.894	3

Correlation analysis indicated that SE, PF, Age and Gender to have significant correlation with EI. Thus, regression analysis (see Table II) was conducted with SE, PF, Age and Gender taken as predictors for EI. The model summary reports Adjusted R Square of 0.586, suggesting that 58.6% of the variation in EI is explained by the variation in the set of independent variables of SE, PF, Age and Gender. Analysis of the variance (ANOVA) confirms that at least one of the predictors make a significant contribution to the model (see Table III).

**Table II: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.782 <sup>a</sup>	0.612	0.586	1.0516848

**Table III: ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	104.704	4	26.176	23.666	0.000 <sup>a</sup>
	Residual	66.362	60	1.106		
	Total	171.066	64			

Which predictor contributes significantly to the model? The coefficients table confirms that SE, PF, Age and Gender all make a significant ( $p$  value < 0.05) contribution to the model (see Table IV). In other words;

$$EI = 3.34 + 0.819SE + 0.228PF - 0.085Age - 0.693Gender$$

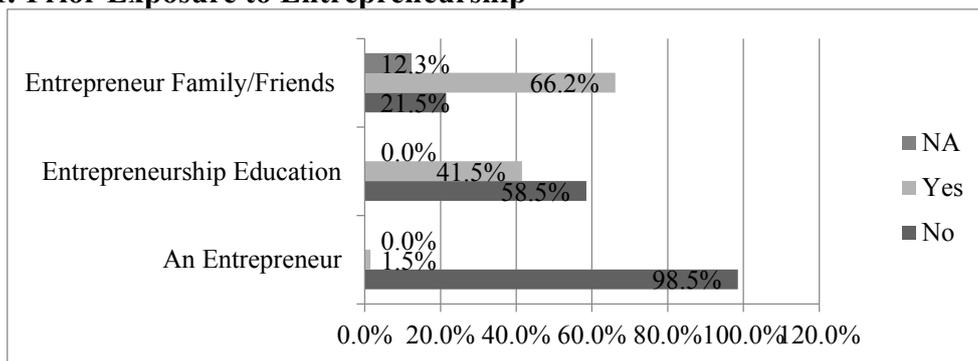
**Table IV: Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	3.340	0.906		3.687	0.000
	SE	0.819	0.128	0.566	6.390	0.000
	PF	0.228	0.104	0.194	2.205	0.031
	Age	-0.085	0.016	-0.420	-5.196	0.000
	Gender	-0.693	0.300	-0.194	-2.310	0.024

The researchers were also asked of any exposure to entrepreneurship prior to their participation in this study. Out of the 65, 27 (41.5%) reported to having undertaken some kind of formal entrepreneurial education in the past. This include among others entrepreneurship course as part of their undergraduate degree programmes, entrepreneurship seminars and workshops, etc. Furthermore, a higher percentage of the researchers, 66.2% (43 out of 65) reported to having exposure to entrepreneurship by having either family members or friends who are entrepreneurs. 8 (12.3%) of the researchers opted not to answer to this question. Plus, one (1.5%) out of the 65 researchers reported as being an entrepreneur. Figure I below provide summary of this findings.

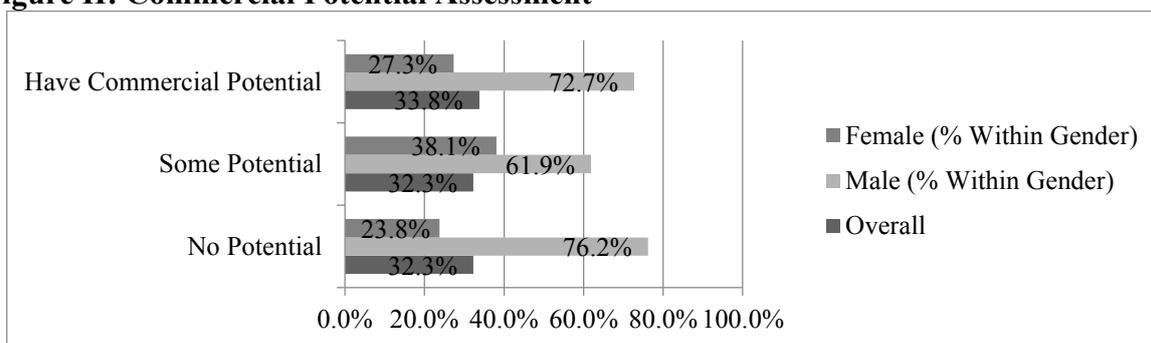
The academic researchers were then asked to assess the commercial potential of their ongoing research work, in this case their Master or PhD research. Nearly a third of them, 21 (32.3%), felt that their work had no commercial potential; just an academic work that would lead to some publications. The other one third of the researchers, 21 (32.3%), did believe that their work had some potential in the forms of practical applications of the research findings by potential stakeholders.

**Figure I: Prior Exposure to Entrepreneurship**



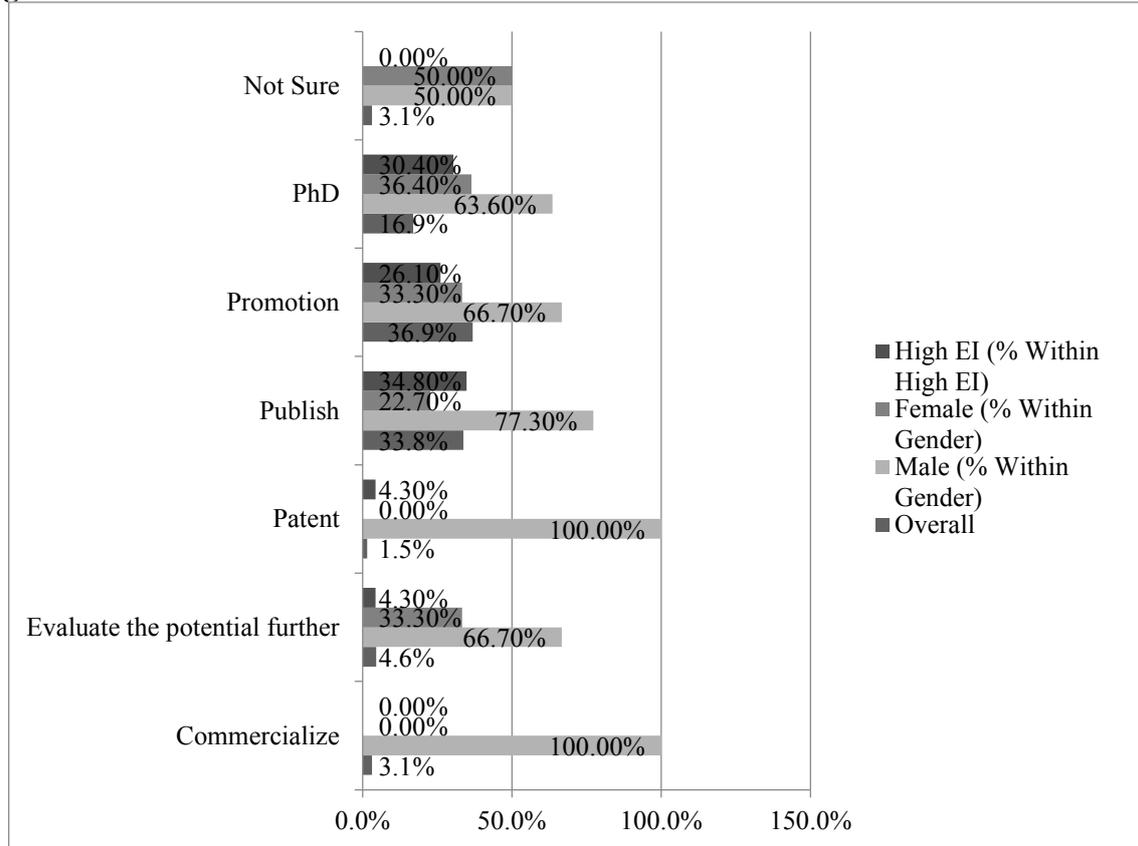
A further 22 (33.8%), reported more confidently that their work had commercial potential with 5 (7.7%) claimed that they will be producing a prototype and another 5 (7.7%) believed that they will produce patentable research output. The remaining 1 researcher was not sure of the commercial potential of his work. This is explored further to see the difference in the responds between male and female academic researchers. The following Figure II provides the summary of the findings.

**Figure II: Commercial Potential Assessment**



The researchers were then asked their intention to commercialise their research work upon completion. Only 2 (3.1%) out of the 65 researchers reported that they intend to commercialize their research output. A further 3 (4.6%) planned to evaluate further the commercial potential of their research upon completion, while 1 (1.5%) intend to file for a patent. Majority of the researchers, 24 (36.9%) planned to use the qualifications gained from completing their postgraduate research to progress further in their current career. A further 22 (33.8%) planned to publish their research findings. Among the Master candidates, 11 (16.9%) planned to continue their research at PhD level.

Next, those with EI score of 6 or more were identified and these 23 (35.4%) were categorized as High EI. The group consist of 19 (82.6%) male, 4 (17.4%) female, 12 (52.2%) PhD candidates, 11 (47.8%) Master candidates, and 9 (39.1%) of them have had prior exposure to entrepreneurship. The intention to commercialise was explored further to see the difference in the responds between male, female and High EI academic researchers. Following Figure III provide summary of the responses.

**Figure III: Intention to Commercialise**

## DISCUSSION

The main aim of this study is to investigate the level of entrepreneurial intention among academic researchers in a Malaysian university. Specifically, in relations to the intention to commercialize their research output as this important towards the realisation of the government agendas highlighted earlier. It appears that even though one third of the group believed that their research had commercial potential, only a small portion of them (2 out of 65 or 3.1%) actually had the intention to the commercialize their work when complete. One of them was exploring aspects of user engagement in mobile-based augmented reality games and as part of his research design; he produced a prototype game to test his propositions. Thus, he intended to offer his game on the Play Store (Android) and App Store (IOS). The other researcher, when quizzed further was not clear on how and what exactly he intended to commercialize out of his work. Interestingly, neither of them recorded High EI. So, it is believed that by producing a complete product that is tested during the course of the research made it easier for the researcher to see the commercial viability of their research output and thus, the opportunistic intention to commercialize.

Furthermore, out of the High EI group, none of them had the intention to commercialize their work. Only 8.6% of the High EI group can be seen as intending to consider commercialization of their work with 1 researcher each planned to evaluate the commercial potential further and file for patent respectively. When investigated further among this group, 56.5% of them lacking sufficient knowledge to evaluate commercial potential of their work. This suggests that there is a need for a framework to help guide the researchers in evaluating the commercial potential of their research. The university where the study took place has a process where prior to publishing any research work, the researchers have to submit the public disclosure assessment form to the R&D division of the university. The form is a sequence of questions that allows the division to determine the originality of the work, as part of their

quality control measure, and the answers to questions are also used to decide whether public disclosure is allowable or some form of protection is needed to enable for future commercialization of the work. If the form is made more comprehensive, it can serve as a tool for the researchers to do the assessment of the commercial potential of their work.

The other 10 out of 23 High EI researchers, had better understanding of the potential of their work where they each able to envision how the work can be commercialized. 6 of them identified industrial users as their potential clients and were not sure how they could go about in reaching these potential clients. The other 4 suggested spin-outs as the commercialization strategy for them but raised the question of resources needed. The university needs to provide matching services (matching to potential clients, business partners, investors, etc) to help increase the rate of commercialization by such researchers.

From the median and mode analysis, it can be argued that academic researchers have strong potential towards entrepreneurship. However, based on the findings the potential did not seem to translate into a more concrete entrepreneurial intention vis-à-vis the commercialization of their research work. Possible solution to this situation may lie in providing more entrepreneurship engagement and education to the researchers as well as the university itself playing a more active role within the local entrepreneurship eco-system beyond the traditional role of providing human capital. Furthermore, the entrepreneurship eco-system within the university needs to be developed via the setting up of entrepreneur development units, start-up or spin-out policies and funds, accelerator programmes, business incubators, etc. Such measures are needed if a higher level of academic entrepreneurship is to be seen in Malaysian universities.

The findings also suggest there seems to be a marked difference between male and female researchers. Female researchers seem to have less inclination towards commercialising their research as well as EI in general. Older researchers also showed a similar pattern. However, with increasing trend observed in numerous studies in terms of the growing importance of post-retirement entrepreneurs and women entrepreneurs, such insights should be incorporated to design engagement strategies targeted for these groups of researchers.

## CONCLUSIONS

The case study has revealed that there is still some way to go before the realisation of the government agenda outlined in 10<sup>th</sup> Malaysia Plan. The challenge lies in the transforming of the commonly high self-efficacy among the researchers into entrepreneurial intention to small extent, and to entrepreneurial intention relating to their research work more significantly.

The case study approach does not naturally lend itself to generalizations. Further work needs to be done in order to find meaningful causal relationships between the explored factors. This research being focused on one university, it would be useful to replicate the study of other universities in Malaysia. This may lead towards some findings that can be generalized.

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