THE MODERATING EFFECTS OF INNOVATIVE WORK BEHAVIOUR TOWARDS PERFORMANCE FACTORS AMONG ENTREPRENEURSHIP LECTURER IN MALAYSIA POLYTECHNIC

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ABSTRAK

Kajian ini direka bentuk untuk menentukan faktor penilaian pelajar bagi meningkatkan keupayaan prestasi pengajaran dalam kalangan pensyarah keusahawanan di politeknik. Kajian ini menggunakan penyelidikan penjelasan untuk membuktikan tentang hubungan faktor keberkesanan pengajaran terhadap prestasi pensyarah keusahawanan di bawah kesan penyederhana dalam tingkah laku kerja inovasi. Reka bentuk kajian ini berdasarkan kaedah tinjauan menggunakan soal selidik sebagai alat untuk mengumpul data dan menggunakan perisian IBM SPSS 22.0 dan Smart SEM-PLS 3.2.4 untuk menganalisis data utama daripada responden. Populasi kajian terdiri daripada pelajar kejuruteraan yang mengambil modul keusahawanan dan keusahawanan digital sebagai subjek teras dari Politeknik yang melibatkan 375 responden daripada 33 politeknik di Malaysia. Kajian ini turut melibatkan pembinaan dan pengujian lapan hipotesis bagi mengukuhkan teori dan keupayaan kajian untuk meramalkan tentang fenomena sosial. Analisis ini telah menjawab lapan soalan penyelidikan dan mencapai lapan objektif penyelidikan berdasarkan penyataan masalah. Keputusan kajian mendapati bahawa enam daripada lapan hipotesis disokong manakala dua hipotesis tidak disokong. Kaedah inovasi dalam pengajaran, alat teknologi pendidikan, dan integrasi sosial pensyarah menunjukkan hubungan langsung dengan prestasi pensyarah keusahawanan kecuali pemboleh ubah keupayaan pembelajaran pensyarah. Tingkah laku kerja inovatif sebagai pemboleh ubah penyederhana mempengaruhi hubungan antara kaedah inovasi dalam pengajaran, alat teknologi pendidikan, dan integrasi sosial pensyarah. Kajian ini telah menghasilkan kerangka teori yang menyumbang kepada pengetahuan tentang keberkesanan pengajaran dalam kalangan pengajar keusahawanan dalam meningkatkan keupayaan untuk mencapai misi dan visi institusi dan mencapai matlamat pencipta pekerjaan dalam kalangan pelajar kejuruteraan. Kajian ini merumuskan perbincangan tentang implikasi teoritikal, praktikal dan metodologi, batasan kajian dan cadangan penyelidikan masa hadapan.

Kata Kunci: Prestasi Pensyarah Keusahawanan, Tingkah Laku Kerja Inovatif, Integrasi Sosial, Institusi TVET Politeknik, Alat Teknologi Pendidikan.

ABSTRACT

This study designed to determine the student evaluations to improve teaching ability performance among entrepreneurship lecturers in polytechnic. It used explanatory research to provide evidence on relationship of effective teaching factors to entrepreneurship lecturer performance under moderating effects of innovation work behaviour. The design of this study is based on survey method using questionnaire and using IBM SPSS 22.0 and Smart SEM-PLS 3.2.4 software to analyse the premier data from respondents. The population of the study consists of engineering students who take the entrepreneurship subject which involves 375 respondents from 33 polytechnics in Malaysia. This involves constructing and testing eight research hypotheses to establish the theory's worth and its ability to predict about social phenomena.. The analysis answered eight research questions and achieve objectives based on the problem statement. Results of the study found six out of eight hypotheses are supported while two hypotheses are not supported. Innovation method in teaching, educational technology tools, and lecturers' social integration showing the direct relationship with the entrepreneurship lecturer performance except for lecturers' learning capabilities. Innovative work behaviour as a moderating variable affecting the relationships between innovation method in teaching, educational technology tools, and lecturers' social integration. This study resulted in a theoretical framework that contributes to the knowledge of the effectiveness of teaching among entrepreneurs educator in improving the ability to achieve the mission and vision of institutions whereas to achieve the goal of job creator among engineering students. The study concludes with a discussion of the theoretical implications, practical and methodological, limitations of the research and future research recommendations.

Key words: Entrepreneurship Lecturer Performance, Innovative Work Behaviour, Social Integration, Polytechnics TVET Institutions, Educational Technology Tool.

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LIST OF ABBREVIATIONS

AVE	Average Variance of the Extract
CR	Composite Reliability
DE	Digital Entrepreneurship
DV	Dependent Variables
GII	Global Innovation Index
ICT	Information and Communication Technology
IHL	Institutions of Higher Learning
IV	Independent Variables
IWB	Innovative Work Behavior
LC	Learning Capabilities
MEB	Malaysia Higher Education Blueprint
MOHE	Ministry of Higher Education Malaysia
MPEC	Malaysian Polytechnics Entrepreneurship Centre
MV	Moderating Variables
OYA	Othman Yeop Abdullah
SEM	Structural Equation Modelling
SI	Social Integration
TPB	Theory of Planned Behavior
TVET	Technical Vocational Education and Training

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Soaring Upwards is the official slogan of the Ministry of Higher Education Malaysia (MOHE) aims to provide an overview of the higher education landscape in Malaysia which increasingly improved and also to accelerate the growth of a talented, entrepreneurial and balanced human capital (Selvaratnam, 2016). The expression also able to demonstrate the hard work and efforts of higher learning institutions , making the higher education performance and quality in Malaysia increasingly better and realise that continuous efforts are needed to boost the country's higher education to a higher level.

Entrepreneurship educators have a central role, as they have a strong impact on the attainment of learners. Reflective lecturers keep their practice under constant review and adjust it in the light of desired learning outcomes and of the individual needs of students (Rose, 2012). As a key competence in entrepreneurship lecturer performance, entrepreneurship does a necessarily involve a core subject in Technical Vocational Education Training (TVET) institutions. Rather, it requires a way of teaching in which experiential learning and project work have a main role. Teachers do not provide students with the answers, but help them to research and identify the right questions and find the best answers.

To inspire their students, and to help them develop an enterprising attitude, lecturers need a wide range of competences related to creativity and entrepreneurship; they require a learning institute environment where creativity and risk-taking are

encouraged, and mistakes are valued as a learning opportunity. Whilst the Malaysia believes that entrepreneurship and innovation are the catalysts of growth it is increasing its support to strengthen the teaching professions, it is also raising the level of its challenge (Syahira, 2014).

Looking at another way, this study are about the innovation entrepreneurial environment among teaching staff in the higher education, Malaysia is a suitable case to assess the role of entrepreneurship in developing countries when the researcher Zamberi and Xavier (2012), classified the categories, firstly from 2000s onwards, Malaysia has shown an outstanding economic growth, averaging at 3-5 per cent per year. Assuming that the gross domestic product (GDP) is connected to entrepreneurship levels, it can be estimated that there is enough bandwidth over time to record of changes in the features of entrepreneurship. Secondly, Malaysia has contributed several times in the Global Entrepreneurship Monitor (GEM) since 2006. GEM is a unique project in which standardized methods are being used to assess the entrepreneurial activity around the world. As a result, the role of entrepreneurship in education can be evaluated in different development phases.

The fact that Malaysia has participated in GEM research, it has given us the opportunity to cross-reference data in this study. Globally, from the figure 1.1; it shows that physical infrastructure received the highest rating, with value above 6. In the weakest condition, with value 4.09, is the entrepreneurship education at school stage. While in entrepreneurship education at the post school is 5.15. It indicates that a combination of conditions that make up the context in which entrepreneurial activities take place.

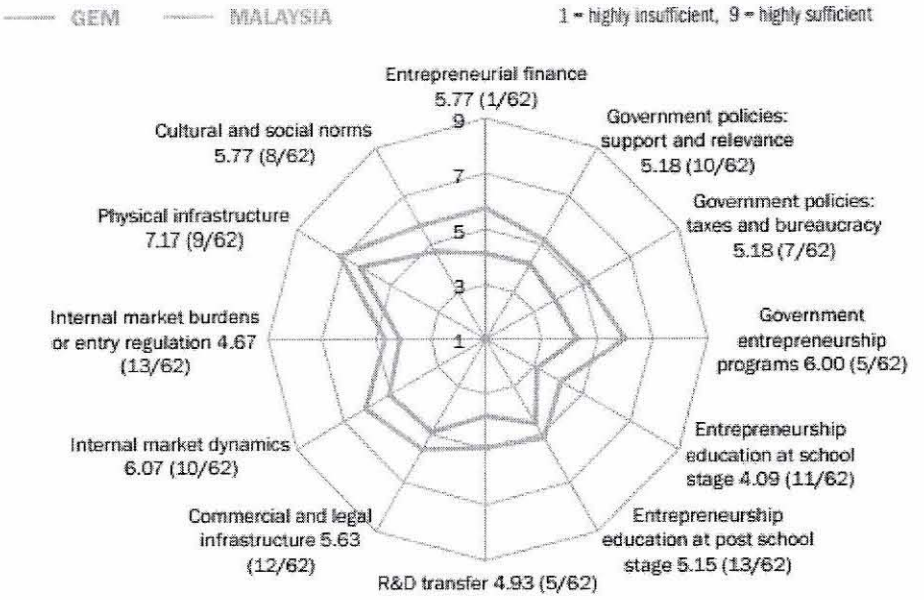

Figure 1.1
Expert Ratings of the Entrepreneurial Eco-system
Source: GEM National Expert Survey (NES) 2015

On another one hand, the performance indicator of innovative entrepreneurial activities has also been carried out through Global Entrepreneurship Monitor (GEM) research program which is aimed at measuring entrepreneurial activities that apply interesting innovation (Xavier et al., 2010). GEM was established in 1999 in the form of partnership between London Business School, United Kingdom and Babson College, United States. GEM is currently conducting an extensive research for entrepreneurial innovation in 59 countries globally. The present study is using reports released by GEM as a benchmark to measure the level of innovativeness being implemented in various entrepreneurial activities in Malaysian context.

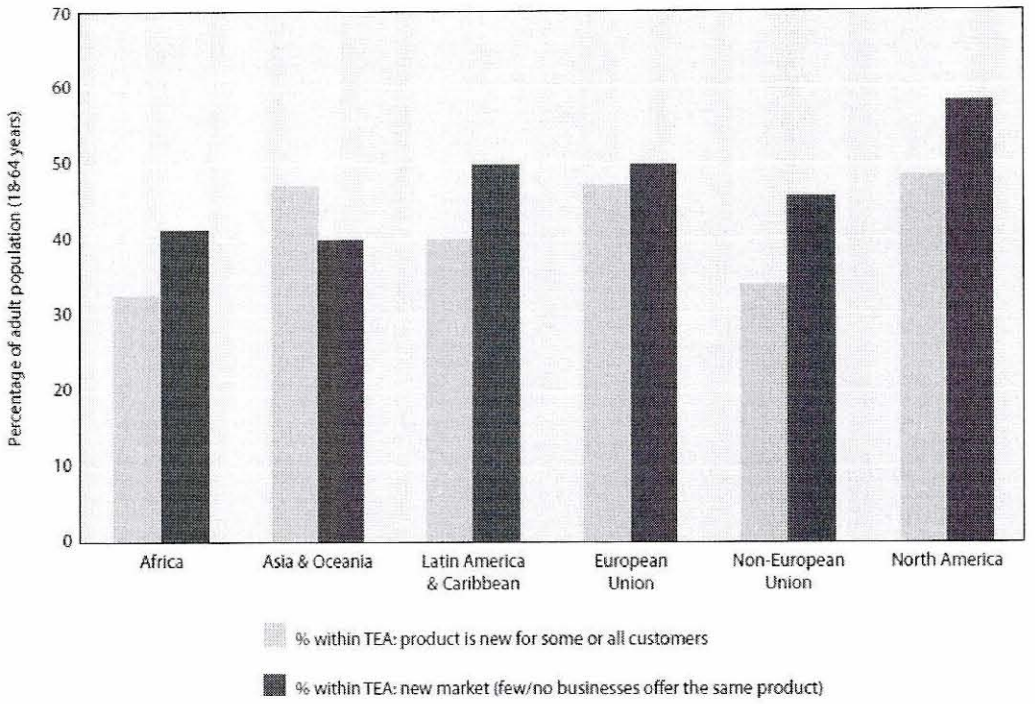

Figure 1.2
Innovative Orientation of the Early-stage of Total Entrepreneurial Activity (TEA) in Different Geographical Regions
Source: Global Entrepreneurship Monitor 2014 Global Report

Figure 1.2 shows the percentage of early-stage of Total Entrepreneurial Activity (TEA) in different geographical regions on the basis of the following factors: (i) Percentage of TEA where products/services are totally new to consumers and (ii) Percentage of TEA where new methods are applied with little or no other businesses offer similar products/services. The report from (Xavier et al., 2013) indicated that the ratio of efficiency-driven economies of Malaysia against other countries is regarded as relatively low. However, there is an increase in entrepreneurial activities, mainly because the government has provided various incentives to improve the level of entrepreneurial activities in the country. However, it was also reported that Malaysia is still lacking in providing entrepreneurship education (Xavier et al., 2013).

Support for entrepreneurship has never been more important than it is now. Reinforcing entrepreneurial education in schools, TVET institutions and universities will have a positive impact on the entrepreneurial dynamism of Malaysian economy. Indeed, besides contributing to the creation of social enterprise and business start-ups, entrepreneurship education will make young people more employable and more 'intrapreneurial' in their work within existing organisations, across the social, public and private sectors. Therefore investing in entrepreneurship education is one of the highest return investments that Malaysia can make such as Entrepreneurship Development Policy for Institutions of Higher Learning launched 2010 with three main objectives; produce graduates with entrepreneurial mindset and capabilities, increase the number of graduate entrepreneurs and nurture entrepreneurial academics and researchers.

In terms of educational research development, Etzkowitz and Leydesdorff (2000), found a specialised method to perform innovation. It is done through collaborative research with expertise. The creativity and synergy created within the private sectors are utilised as the main drivers behind Malaysia's development growth. The main factor that encourages the growth and productivity is innovative thinking. There are different kinds of innovation which include products, processes, and services. Innovation requires a widespread reform to ensure that Malaysia is able to continue prosper and keep progressing in the long run. It is also seen as substantial in the case of the declension of organisation's ability to generate new knowledge. For example, the Eleventh Malaysia Plan (2016-2020) stated that there was a reduction in the number of investors from 21.3% per 10,000 labours in 2004 to 20.3% per 10,000

labours in 2008. In terms of consumers' spending pattern, it was discovered that the ratio of Gross Domestic Expenditure on Research and Development (GERD) over GDP declined from 0.69% in 2004 to 0.21% in 2008 (Malaysia Plan, 2011).

This study explores the students' evaluation of entrepreneurship lecturer performance in Malaysia's Polytechnic as a Technical and Vocational Education and Training (TVET) education institutions, particularly in terms of implementation of entrepreneurship education in curriculum. Education and training agenda in innovation practiced by these institutions depends on how Malaysians value openness, critical thinking, and if they dare to accept risks and challenges. The 10th Malaysia Plan (10MP) for the period 2011 to 2025 highlighted significant reforms in TVET system in Malaysia (Economic Planning Unit, 2010). One of the important agenda is to create and promote entrepreneurial culture. Entrepreneurial skills do not only help graduates to better perform in their careers but also improve organisational performance.

To require success in the long run, innovation is perceived no longer as a strategic choice but a strategic necessity (Drucker, 1999; Hamel and Prahalad, 1994; Nijssen and Frambach, 2000). Davidsson and Honig (2003) argued that individual performance in an organisation will become more stable in a highly innovative environment, which can only happen if continuous research and development takes place. Lin (2011) found that innovation has a positive relationship with development. On the other hand, Global Innovation Index (GII) was established in 2011 as a benchmark that is designed to measure a country's position in the global competitive environment. Figure 1.1 shows the assessment framework of GII in 2014.

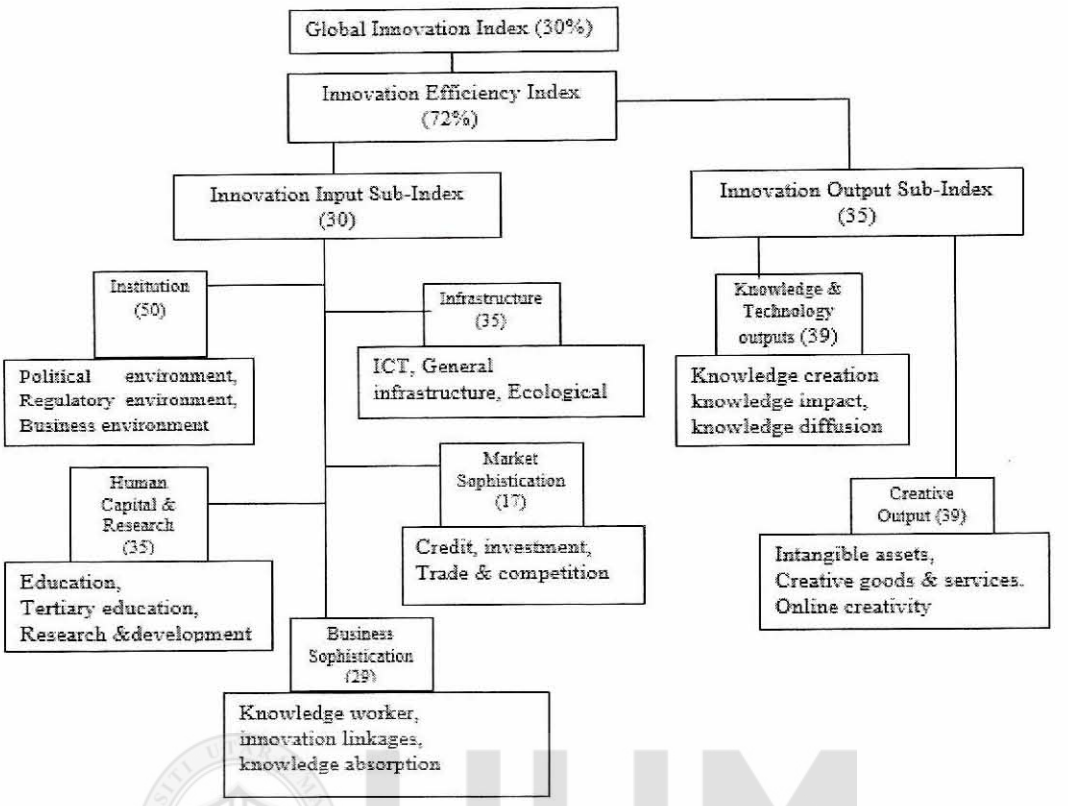

Figure 1.3
Evaluation Framework of Global Innovation Index 2014
Source: Retrieved from http://www.mastic.gov.my/web/guest/gii

In 2014, the position of Malaysia in all criteria measured in the Global Innovation Index (GII) showed Malaysia's GII was ranked 33rd out of 143 countries. In terms of 'innovation input', Malaysia was ranked 30th and 'innovation output' was ranked 35th. Meanwhile, 'innovation efficiency' was ranked 72nd. This index was produced on the basis of accomplishments achieved by the country using a number of relevant macroeconomic indicators including the value of Gross Domestic Product (GDP) per capita. Innovation, according to Adıgüzel (2011), helps people to adapt with the development in all areas within the community. It is about dealing with different levels of expectations of individuals or institutions, characterised by the complex thoughts

and ideas in different types of expertise and leadership style (Kılıçer & Odabaşı, 2010). Early stage of innovation involves identifying different problems faced by an organisation. It is then continued with development of proposal and ideas before eventually creating something to be applied to solve the problems (Koçak & Önen, 2012). If individuals embrace a high level of innovation, innovation process will be pursued effectively and gain success at the end of the process. (Naktiyok, 2004).

At national level, entrepreneurial activity has a notable impact on economic progress. The past decades have seen a massive change in the emerging economies such as the BRICs – Brazil, Russia, India, and China – driven by the determined entrepreneurs. In this case, the focal point of entrepreneurship training programs at Malaysian Polytechnics is to instil the right mind-set on students, which consists of the following elements: (i) knowledge, (ii) attitude, (iii) experience, (iv) achievement and (v) skills regardless of their study background (Norasmah, Halimah, Zaidatol, 2006; Rafidah, 2008). Encourage values and attributes of entrepreneurial skills in higher learning institution required the involvement and support from the citizen. Consequently, this study will analyse the moderating effects between innovation work behaviour in entrepreneurship teaching performance of lecturers in Malaysia Polytechnic as a Technical and Vocational Education and Training (TVET) education institutions, particularly in using students' evaluation.

If citizens in higher learning institution, such as universities, polytechnics and community colleges from various backgrounds can be shaping minds with entrepreneurial culture, an institution would be more viable and competitive not only at the local level but also at international level. Effectiveness among the lecturers

should be studied for focusing on success rate exceeds the input, in addition to applying technology and innovation integrated learning concepts to meet the needs and enhance the student learning experience, Malaysia Higher Education Blueprint 2015-2025, (MEB 2015-2025).

The Malaysia's Department of Polytechnic Education in 2009 stated that the Transformation Plan of Malaysian Polytechnics is aimed at producing graduates with marketable characteristics and entrepreneurial skills by the year 2015. Thus, in 2011, the Ministry of Higher Education has finally established the Malaysian Polytechnics Entrepreneurship Centre (MPEC) on the 30th October 2011; an entity that provides policy guidelines to be implemented by the Polytechnics (Md.Nor, 2011). It also outlines suitable programs to be organised and values to be embedded within the curricular and non-curricular systems.

Overall, in studies from Silong (1986) and Halim (2009), was concluded the scope of lecturer's jobs includes three main task areas which are to teach, to educate and to impart. However, individual development and the quality of work expected of it should be a positive impact on the lecturer, faculty or university. But in this study, one of the main tasks, namely to teach will be reviewed to ensure the competence and effectiveness of significant teaching performance task fulfil the requirements needs from, (MEB 2015-2025) requires academic programs in institutions of higher learning (IHL) to have entrepreneurship education in order to produce graduates who have acquired entrepreneurial skills and implementing high-impact educational practices (HIEP) through the application of entrepreneurship across the curriculum and field of study. It is hope that this study will provide a major impact in determining the soaring

upward academic achievement can be improved through the study of student evaluations' teaching performance.

1.2 Problem Statement

Engineering lecturers in Malaysian Polytechnics are lack of knowledge, some are without entrepreneurship skills, lack in experiences, training and mastery of teaching methods (Siti, Noor & Salwuan, 2010; Nasrudin, 2012; Azizee, Mazura & M.Salihin, 2010). Failing to clarify about the performance strength of entrepreneurship lecturers can lead to serious confusion in realizing the implementation of the vision and mission in Polytechnic as TVET institutions that nurture the entrepreneurial skills among students.

Lecturers who teach entrepreneurship education are commonly pressured with high level of stress as they need to learn new knowledge, skills, and attitudes. This is prominent when the lecturers themselves do not have the right knowledge and skills to teach the subject. In the view of many researchers (Mohd Zahari, 2010; Azizee, Mazura & M.Salihin, 2010; Norfadhilah & Norasmah, 2012), for example in the case of engineering lecturers in Malaysian Polytechnics, they seem to be failing at delivering the subject matter in terms of its practical applications. Moreover, (Nasrudin & Othman, 2012), 53% of students believe the content of entrepreneurship modules in polytechnics are not comprehensive and effective, too theoretical, not multi-disciplinary, lack application of the knowledge and skills, do not encourage creativity and innovativeness, and do not emphasize motivational and business management elements. Based on the issues mentioned above, this research would like to explore

about effectiveness and overall performance of entrepreneurship lecturers in polytechnics and get the findings either engineering students would like to consider entrepreneurship as a desirable career option and satisfied with their entrepreneurship lecturers' performance or not.

The researches by Fatoki (2014); Tasnim (2012); and Mwasalwiba (2010) concerned that the innovative teaching method uses in the entrepreneurship course is currently witnessing a widespread change in the approaches to teaching and curriculum from traditional lecturing to innovative methods as an active learning strategies such as lectures (it depends on the effective cooperation between the lecturer and the students in the teaching process) and case studies (the student tries to achieve their learning objectives through the interaction with the teaching material depending on their abilities and readiness). So, this research would like to explore the effective way to manage the teachable skills and identify the best match between student needs and teaching techniques (Lee and Wong, 2007; Arasti et al., 2012; Luo, & Chen, 2017) in Malaysia Polytechnics to achieve the excellent goal of entrepreneurship educator in teaching performance.

Identically the second independent variable in this study is an educational technology tools. Issues that are currently under discussion focus on how Facebook as an educational technology tool can improve students' performance (Dabner, 2012; Kirschner & Karpinski 2010; Pasek & Hargittai, 2009) but lack of past studies in entrepreneurship lecturer's performance. On the other hand, how and for which purposes Facebook as a tool will be used in educational context are still awaiting researchers' interest. In view of this, it is useful to know the relationship between

Facebook as educational technological tool and the lecturers' entrepreneurship teaching performance because Facebook can be used for work related purposes while new business relationships can be formed and existing ones are maintained although connecting people with shared interests and be seen as a favorable educational tool owing to its structure and various utilities (Ellison et al., 2007). The big issue was either lecturer knows how to become more up-to-date when using software application like Facebook and others to generate new ideas to develop new product design or services.

Thirdly, based on findings from Pantic & Wubbels (2010), lecturers also need to be able to cooperate with students and build positive human relationships. Some characteristics of social integration for lecturer performance are also mentioned in previous studies (Koster et al. 2005; Pantic & Wubbels, 2010). According to Zhu et al. (2013), social integration showed a positive and significant relationship with lecturer performance in term of "Application of innovative thought". Together with the social integration factor, it will explore the lecturers who are more capable of social communication, be able to motivate student, always give students the freedom to express creativity in carrying out the assignment, tells students about the expected competency to be gained in the subject, capable of maintaining a dynamic interaction with student and have the courage to face challenges tend to have better performance in applying the innovative thoughts in teaching practices. Thus, the characteristic of social integration will examine outcome existent in the entrepreneurship teaching performance among engineering lecturers from polytechnic.

Next, the last independent variable factor in this study is particularly learning capabilities. Prior studies have noted the importance of research, suggested that lecturers' learning capabilities is very important for teaching performance (Chen, 2002). However, there is an inconsistency with this argument because the results from Zhu et al. (2013) indicated that lecturers' learning capabilities was not a significant predictor for teaching performance. This seems not to be consistent with another argument, that lecturers' willingness to learn is a crucial factor for implementing educational innovations (Konings et al, 2007). However, such explanations tend to overlook the fact that lecturers' learning capabilities have a positive relationship between teaching performances among lecturers in term of how they are able to learn proactively and apply skills and knowledge of using ICT to learn new things related to new teaching methods from another sources and can learn as much as they can in entrepreneurship module as long they have to teach the module.

Furthermore, the moderating variable in this study namely innovative work behavior. Nowadays, our society expects more from lecturers in terms of education; it is expected that they prepare students not only for work but for life in general. In addition, changes in political behaviour, administration, and laws have an effect on the work in TVET institutions (Nieuwenhuis, Mulder, & Van Berkel, 2004). As a consequence of all these changes and demands, TVET institutions must be responsive (Nijhof & Streumer, 1994) and innovations are required. Innovations are considered as products or processes that are new, applicable, and useful in a specific work context (Kanter, 1988). Innovation in TVET institutions can be new instructional objective or didactic method, changes in work processes such as collaboration between lecturers, or new

work tasks of lecturers (Fullan, 2007). Innovations are not restricted to the classroom but include the wider context within and outside the school. According to Messmann, Mulder, and Gruber (2010), there is lack of research about the lecturers' activities analysis on developing innovations in teaching even they had acknowledged the contribution and role in the process of innovation and how their active contribution can be stimulated and nurtured. Hence, this study will find out either entrepreneurship lecturers are always looking for new working methods, techniques or instruments and put effort in the development of new product design or services or not as the dynamic and context-bound construct have to meet the criteria based on theoretical arguments and methodological requirements (Bauer & Mulder, 2010).

To sum up as a final point about the gap in this study, innovative work behaviour has a moderating role which has to be measured based on work activities (De Jong & Den Hartog, 2007; Kleysen & Street, 2001; Battistelli et. al., 2014) into educational field; specific in entrepreneurship teaching performance to search out new working methods, techniques or instruments, attempt to convince people to support an innovative idea, introduce innovative ideas into teaching practices and put effort in the development of new product design or services. Furthermore, innovative work behaviour research design could be linked to theories from other disciplines such as using the theory of planned behaviour. It would also be valuable to use advanced quantitative research techniques, such as structural equation modelling or other path analysis approaches (Thurlings, Evers & Vermeulen, 2014).Thus, based on the fact that, in this study, researchers will try to examine whether there is a significant relationship between

innovative work behaviour as a moderator and show either the result is consistent or not for every variable to archive the dependence variable.

Therefore, the conclusion in this study about the review or evaluation of entrepreneurship lecturer performance is compulsory to measure the effectiveness of the changes that take place in the curricular and non-curricular systems, for example the change in government policies especially in the field of entrepreneurship implemented at Polytechnics that is partly the TVET education institutions in Malaysia.

1.3 Research Questions

The problem statement has guided the present study to produce the following research questions:

1. What is the relationship between innovative teaching methods towards entrepreneurship lecturer performance in polytechnic?

2. What is the relationship between educational technology tools towards entrepreneurship lecturer performance in polytechnic?

3. What is the relationship between lecturers' learning capabilities towards entrepreneurship lecturer performance in polytechnic?

4. What is the relationship between lecturers' social integration towards entrepreneurship lecturer performance in polytechnic?

5. What is the moderating effect of innovative work behaviour on the relationship between innovative teaching methods towards entrepreneurship lecturer performance in polytechnic?

6. What is the moderating effect of innovative work behaviour on the relationship between educational technology tools towards entrepreneurship lecturer performance in polytechnic?

7. What is the moderating effect of innovative work behaviour on the relationship between learning capability towards entrepreneurship lecturer performance in polytechnic?

8. What is the moderating effect of innovative work behaviour on the relationship between social integration towards entrepreneurship lecturer performance in polytechnic?

1.4 Research Objectives

The present study is aimed at identifying the variables affecting lecturer performance. The research objectives are as follows:

1. To determine the relationship between innovative method and entrepreneurship lecturer performance in polytechnic.

2. To determine the relationship between educational technology tool and entrepreneurship lecturer performance in polytechnic.

3. To determine the relationship between lecturers' learning capabilities and entrepreneurship lecturer performance in polytechnic.

4. To determine the relationship between lecturers' social integration and entrepreneurship lecturer performance in polytechnic.

5. To examine the moderating effect of innovative work behaviour on the relationship between innovative teaching methods towards entrepreneurship lecturer performance in polytechnic.

6. To examine the moderating effect of innovative work behaviour on the relationship between educational technology tools towards entrepreneurship lecturer performance in polytechnic.

7. To examine the moderating effect of innovative work behaviour on the relationship between learning capabilities towards entrepreneurship lecturer performance in polytechnic.

8. To examine the moderating effect of innovative work behaviour on the relationship between social integration towards entrepreneurship lecturer performance in polytechnic.

1.5 Scope of the Study

This study aims on determining the relevant effective factors for lecturer's performance to achieve better entrepreneurship teaching performance among

engineering lecturers. To achieve this objective, this study is encompassed by the following scopes:

1. The unit of analysis is individual. This study is using student's evaluation to evaluate entrepreneurship teaching performance after the end of the program which students should be utilized as respondents as they are the only people who can effectively evaluate their lecturers in classroom (Halim, 2009). The respondents are students from engineering department who has taken the course of Entrepreneurship and Digital Entrepreneurship in Malaysia polytechnics.

2. This study is focusing on the lecturers who have completed teaching in the course of Entrepreneurship and Digital Entrepreneurship from engineering department in polytechnics across Malaysia.

3. All of the related analyses such as descriptive, correlation, and multiple regressions were performed by using SPSS v.22 statistical technique and Smart PLS 3.2.4.

1.6 Overview of Malaysian Polytechnic

In reference to the history of the establishment of Malaysian Polytechnics, Ungku Omar Polytechnic (PUO) was the first polytechnic established under the Colombo Plan (Yusni and Zainab, 2013), offering several full-time, part-time, long term and short term courses to fulfill the industrial needs in Malaysia. This is in accordance to its establishment mandate covering various fields such as engineering, hospitalities, commerce and others. At the time, PUO was under the supervision of the Technical and Vocational Education Division, Ministry of Education. Polytechnic establishment was one of the matters discussed in the first meeting of the Higher Education Council

in 1968 on plans pertaining to education which could contribute to the advancement of national higher education institutions (MOHE 2010).

Initially, PUO only focused on Technician courses and several other courses including accounting, mineral technology, earth studies and shorthand. Until now, in line with the rapid growth of national development and to cater to the increasing number of student intakes, a total of 33 polytechnics (3 premier polytechnics, 26 conventional polytechnics and 5 metro polytechnics) are in operation with 30 different niche areas. Department of Polytechnic Education (DPE) is a department under the purview of Ministry of Higher Education, which functions as the headquarter and coordinator for all polytechnics in Malaysia. According to the statistics, in 2015, the percentage of polytechnics graduates' employability was 79.5% for 22,541 graduates with degrees, advanced diplomas, diplomas and certificates in engineering, technology, commerce and services (Polytechnic Information, October 2016 Edition). In addition, full time enrolment of students up to October 2016 was 99,551 students (Polytechnic Information, October 2016 Edition).

To fulfill the expected human capital towards developing Malaysia as a modern and competitive country, the government has launched a basic principle and policy concerning polytechnics. Launched in 2010, it was named Hala Tuju Transformasi Politeknik (Polytechnic Transformation Plan). This plan clearly illustrated the government's strong effort and high hopes for the Malaysian Polytechnics. The Polytechnic Transformation Plan was an early effort on the government's part to build new capacity for sustainable human capital development in Malaysia, where it has turned Malaysian Polytechnic as the main stakeholder in ensuring that the human

resources matches industry needs especially according to the New Economic Model which emphasises on innovative and creative human workforce.

If one is to look from the TVET ecosystem perspective, the government very much hoped that Malaysian Polytechnics will be the main player in ensuring the hopes and aspirations of the country's development can be realised. Therefore, in order to achieve this mission, polytechnic transformation objectives has been lined out namely; (1) To thrust polytechnics as the institute which takes the helm in the field of technical and vocational education, (2) To make study programs at polytechnics more relevant and responsive towards national economic development, (3) To helm niche areas and selected technologies which enables polytechnics to produce quality graduates, ones who are enterprising, or high marketability and competitive, (4) To build international reputation and branding which puts polytechnics among the ranks of the nation's top higher education institutions, and (5) To diversify and widen course offers to make it attractive towards prospective students.

The Malaysian Polytechnics were seen to actively progress towards the government's aim and objectives. Among the efforts made are developing and offering courses based on various approaches, namely innovation and entrepreneurial aspects, which require a high degree of cooperation, commitment and understanding with industrial sectors. In addition, an elected advisory panel from industry stakeholders was introduced to ensure the courses offered matches industry needs.

In line with the Fourth Thrust of the National Higher Education Strategic Plan (PSPTN), namely to strengthen higher education institutions, polytechnics do not want

to lag behind in offering the best quality education (MOHE, 2010). Polytechnics need to advance to prepare for situations that are challenging and may require actions which are out of the ordinary. This initiative will produce polytechnics which combines productivity, creativity and innovation, in line with the need to produce the nation's much needed human resources especially in a high income economic model.

The Polytechnic Transformation Plan was aimed at building new capabilities in developing the nation's human resources to fulfill the new economic model needs which is based on innovation and creativity. This is in line with the Second Thrust of the National Mission which is to raise the capacity for knowledge and innovation while nurturing 'first class mentality'.

The higher education sector's strategic direction is to produce human resources which are educated, skilled, creative, innovative, competent, productive, of strong character and good manners; ones that are capable of applying knowledge to good use, improving the country's competitiveness, and to spur and bring transformation. In addition, the Third Thrust of the Transformation Plan lined out that polytechnic member must be equipped with high knowledge and skills. Specific initiatives to be implemented under this thrust are: to develop 'critical mass' of at least 15% lecturers with PhD qualification and at least 40% at Master's degree level; to attract the best talents to become polytechnic lecturers; to strengthen lecturers' professionalism via performance-based promotion practices; to continuously improve lecturers' skills and competence via professional/industry certifications; and to implement succession plans to identify, guide, and build 'critical mass' leaders for the present and the future (MOHE, 2010).

In recent times polytechnics have gone through and evolution in education and training, in line with the national economic development needs. The Polytechnic Transformation Plan and agenda is the institution's framework to navigate through globalisation and national aim towards being a high income nation based on innovation and creativity. Teaching plans could be carried out smoothly and effectively provided that there is a high level of innovation amongst polytechnic management. Focus should therefore be given towards improving lecturers' innovation. Lecturers' need high levels of innovation to allow a smooth transformation process. They will be the management innovators who catalyse the polytechnics' transformation process which in turn raises the institutions' capacity for knowledge and innovation aside from nurturing high ethical values amongst its students.

This is in line with the findings of several prior researchers who argued that an innovation 'champion' is pertinent to put forward creative and sound ideas as well as garner support from members of the organisation (Amabile, 1988; Rogers, 2003). For polytechnics under the Ministry of Higher Education (MOHE) in particular, the importance of a champion to stimulate innovation is indisputable. This is in line with the objectives behind the establishment of polytechnics produce skilled technical workforce with high innovation and entrepreneurial skills. Therefore, this transformation program needs creative and innovative 'champions' to support individual developments based on the principle of quality and high performance. This will be achieved by implementing education and training transformation initiatives with the aim to improve sustainable national competitiveness (Roshamimi, 2011).

1.7 Entrepreneurship Development in Malaysian Polytechnics

Under the 11th Malaysia Plan, the development of human resources through entrepreneurship has been identified as an important agenda to support the economic shift toward innovation and knowledge based activities. In accordance, Higher Education Institutions (HEI) need to be proactive in transforming their communication structure to be more flexible and entrepreneurial. In addition, it needs to suit local needs but with global appeal to create an education system that is able to produce holistic, balanced and entrepreneurial individuals who would become job creators, in line with the First Thrust of Malaysia Education Blueprint 2015-2025 (Higher Education). IPT's entrepreneurship programs which are structured and holistic gives students the opportunity to generate income during their studies, aside from increasing their employability.

The process of instilling entrepreneurial principle amongst the Malaysian Polytechnics students was encouraging. This was proven by the government's intense effort in launching several graduate programs since 2006 namely (1) Young Entrepreneur Scheme which covers tourism, halal product as well as food processing and packaging, (2) State Skills Development Centre which aims to increase trainee intakes and introduce new courses under the Industrial Skills Enhancement Program, and (3) PROSPER graduate program which was implemented to encourage graduates to embark on entrepreneurial ventures.

Establishing and improving entrepreneurship programs became a national mission when the government spurred and planned a more robust implementation under the

theme of making entrepreneurship a culture amongst graduates (MOHE, 2010). This national mission based on the importance of entrepreneurship was effectively implemented with the introduction of the National Policy on Higher Education Institution Entrepreneurial Development, launched on 13 April 2010 as an effort to encourage human resources development that produces graduates who are ready to face the challenges of a knowledge and innovation based economy (MOHE, 2010). The introduction of this Policy illustrates the government's high emphasis on entrepreneurship for students in higher education institutions (HEI) including in Malaysian Polytechnics.

Looking back into the Malaysia Education Blueprint 2013–2025, Ministry of Education Malaysia (MOE) also stressed that entrepreneurship is one of the aspects under leadership skills. Entrepreneurship is linked to students' ability to take the initiative, to initiate and develop a business independently and is willing to invest with own capitals, aside from being driven to ensure that the business yields profit (MOE, 2013).

1.8 Definition of Key Terms

Different researchers use totally different definitions of ideas in their studies. The following are the definitions of terms used in this study:

1.8.1 Entrepreneurship Lecturer Performance

In this study, entrepreneurship lecturer performance observes that the polytechnics' lecturers are who are responsible to teach entrepreneurship course to engineering

department students. Besides engineering subjects, the engineering lecturers also need to teach entrepreneurship module or course at diploma and certificate levels for semester one, three, four, five, and six. Entrepreneurship lecturers must always search for change, responds to it, and exploits it as an opportunity (Drucker, 1985). The performance of entrepreneurship lecturers in the field of education and teaching represents the performance achievement in performing their roles in teaching profession (Halim, 2009). Entrepreneurship teaching is positively associated with entrepreneurship-related human capital assets (knowledge, skills, positive perceptions of entrepreneurship and intentions to become an entrepreneur). It is also associated with entrepreneurship outcomes (new venture creation and entrepreneurial performance).

1.8.2 Innovative Methods in Teaching

According to Arasti et al. (2012), the key to a successful entrepreneurship education is to find the most effective way to manage the teachable skills and identify the best match between student needs and teaching techniques. In this study, in this research using the term of innovative method which are more action-based, according to Bennett (2006) are those that require the instructor to facilitate learning, not to control and apply methods that enable students' self-discovery. The used methods in this study are: (1) lectures, (2) case studies, and (3) group discussions. These constructs consist of two factors related with Diffusion of Innovation Theories such as compability and observability.

1.8.3 Educational Technology Tools

In this study, educational technology tools refer to Facebook usage as an educational tool. Facebook is being considered as an educational tool because of its beneficial qualities such as enabling peer feedback, goodness of fit with social context and interaction tools (Mason, 2006). In this variable constructs, comprises three factor to measure relevant with Diffusion of Innovation Theories particularly, perceiveful usefulness, perceived ease of use and observable result.

1.8.4 Learning Capabilities

In this study, the definition operational of learning capabilities is referred to entrepreneurship lecturers which give emphasis to the impact of active learning, which is consistent with the previous findings that lecturers' willingness to learn is a crucial factor for implementing educational innovations (Konings et al. 2007; Zhu et al. 2010). While, MacKinnon (1978) and Chen (2002) proposed that learning capabilities is very important for teaching performance. The entrepreneurship lecturer in engineering department at Polytechnics needs to have the ability to learn.

1.8.5 Social Integration

The social integration term in this study brings up that entrepreneurship lecturer in engineering department at polytechnics have the ability to communicate with students from different backgrounds and cooperate with other colleagues. These abilities are given emphasis to building positive human relationships and getting support from others for teaching (Pantic and Wubbels 2010).

1.8.6 Innovative Work Behaviour

In this study, an operationalization of Innovative work behaviour defines as an individual's behaviour that aims to achieve the initiation and intentional introduction within an entrepreneurship teaching role of new and useful ideas, working methods, techniques and instruments. It requires a specification of the work activities that have to be carried out to accomplish each of the described innovation task. (De Jong & Den Hartog, 2007; Dorenbosch et al., 2005; Kleysen &Street, 2001; Messman & Mulder, 2012).

1.8.7 Entrepreneurship Course in Polytechnic

Entrepreneurship course in this research refers to entrepreneurship subject and entrepreneurship digital subject and it takes a very important place, therefore Polytechnic Education Department under Ministry of Education Malaysia has made Entrepreneurship subject compulsory as an elective for Club/Society (DRK3002) and Entrepreneurship (DPB2012/DPB 2012) as a core course in polytechnics across Malaysia. Digital Entrepreneurship (DE) is a compulsory course too. This course inculcates experience-based lessons where students are asked to operate an online business throughout the 13 weeks course period by implementing course contents.

This course was introduced to prepare students with the skills to use digital platform in conducting business. It also offers knowledge and skills needed to develop individuals to be digital entrepreneurs where students are exposed to various online media, social media and other platforms used by digital entrepreneurs nowadays (Azila, Nurul Hayati & Isrul Hasrita, 2017).

1.8.8 Malaysian Polytechnic

Polytechnic is a TVET education institution that plays an important role in producing human resources with characteristics set according to the criteria by the New Economic Model. Esa et al. (2009), stated that Polytechnic is a technical college under MOHE which is dedicated to provide the platform and opportunity for members of the society to improve their vocational and technical skills.

1.9 Organization of the Thesis

After considering the background, problem statements, research questions, objectives, scope, overview of Malaysian Polytechnic, entrepreneurship development in Malaysian Polytechnics and definitions of key terms, this thesis is organised as follows:

Chapter Two focuses on the literature review that begins with a review on the roles and importance of Entrepreneurship in Polytechnics, while the rest of the discussion covers the literature on Entrepreneurship Lecturer performance in terms of teaching, identified the variables in effective teaching entrepreneurship and also about innovative work behaviour, the generic teaching model for entrepreneurship, the Diffusion of Innovation Theory ,Theory of Planned Behaviour, development of nine hypotheses, describing about moderating role of innovative work behaviour, and research framework.

Chapter Three focuses on the research methodology that discusses the research design, population, sample and sampling process, research instruments, operationalization and

measurement of variables, measurement scale, pilot test, data collection and data analysis technique.

Chapter Four is structured to discuss on data analysis and interpretation that include the response rate, data screening , demographic profile analysis of the respondents, descriptive analysis of the latent constructs, assessment of measurement model, assessment of the structural model, assessment of predictive relevance, assessment of effect size and goodness-of-fit.

Finally, chapter Five is reporting on the findings according to study objectives, which then proceeded with the discussion of findings according to recapitulation of the study, discussion of the findings, contributions of the study, limitations, recommendations, future research directions, and concluding remarks.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter will discuss literature reviews the concepts and theories related to performance, innovation and entrepreneurial teaching variable as well as past studies associated with it. In addition, this chapter will make a deep survey on students' evaluation of lecturers' performance through teaching in entrepreneurship module. Those an effectiveness teaching factors involving namely is innovative method, educational technology tool, lecturers' learning capabilities, lecturers' social integration and innovation work behaviour. The literature search across a varying methods including the use of Mendeley, Google scholar advances, online library, etc. Reference materials are used such as journals, books, newspaper clippings, magazines, theses, reports, internet random survey, as well as the mass media and other printed.

2.2 The Roles and Importance of Entrepreneurship in Polytechnics

Historically, the entrepreneurship curriculum was introduced into polytechnics in 1987 as the Small Business Practice. The subject was taught twice a week to all final semester engineering students at all polytechnics. The main objective of the curriculum was to introduce the essential aspects of small business practices to polytechnic students. To improve and expand the content to focus more on entrepreneurship, in 1992 the Fundamentals of Entrepreneurship course was designed and be made available to engineering students in Malaysian polytechnics (Baharu, 1994).

Entrepreneurship is one of the modules under the Business Studies programs offered to all commerce students. Similarly, Entrepreneurship is also integrated into the co-curriculum structure designed for students studying subjects other than Business. A thorough review of the entrepreneurial studies curriculum was completed in 2006. New approaches and enterprising elements were embedded into the new curriculum to make the teaching, delivery, and learning atmosphere more interesting and attractive to non-business recruits. The newly reviewed curriculum was officially implemented in June 2007. However, the course is an elective module for all non-commerce students.

Although the curriculum content for this non-business learner course is slightly different than that structured for Business courses, the important elements and essence of entrepreneurial studies remain similar to its "bigger brother" course. It includes: (1) Introduction to Entrepreneurship, (2) Entrepreneurial Issues, (3) Inculcating Entrepreneurial Culture, (4) Generation of Entrepreneurial Ideas and Opportunities, (5) Basic Management, (6) Basic Marketing, (7) Financial Management, (8) Business Proprietary Establishment and, (9) Procedures and Business Planning (Azhari, 2008).

In addition, the elective entrepreneurship module offered to all students consists of content approximately similar to the ones stated above. It is anticipated that students will develop an interest in venturing into business or self-employment when they complete their studies. The purpose of the co-curriculum module is to create an entrepreneurship awareness amongst polytechnic students. This module will be examined in detail during the study from the perspective of objective, content and implementation.

Realising the importance of entrepreneurial education amongst students, Polytechnic Education Department under Ministry of Education Malaysia has made Entrepreneurship subject compulsory as an elective for Club/Society (DRK3002) and Entrepreneurship (DPB2012/DPB 2012) as a core course in polytechnics across Malaysia.

This is in line with the National Higher Education Strategic Plan 2011-2015 Phase 2 which focuses on efforts to make entrepreneurial education mainstream. This effort is to increase entrepreneurial skill amongst all students whom will contribute to the nation's economic progress. This plan also gave exposure and instilled entrepreneurial values and skills to university, polytechnic and community college students. It encompasses aspects of leadership, innovation, creativity, competitiveness, independence, ability to take calculated risk, and ability to identify and create opportunities. In accordance, the Ministry of Higher Education has launched entrepreneurial development policy for Higher Education Institute (IPT) on 13 April 2010 which aims to encourage entrepreneurial education and development which is more systematic and holistic in IPTs (National Higher Education Strategic Plan 2011-2015).

Digital Entrepreneurship (DE) is a compulsory course, newly introduced in 2015 to students of all study programs. This course inculcates experience-based lessons where students are asked to operate an online business throughout the 13 weeks course period by implementing course contents. This course was introduced to prepare students with the skills to use digital platform in conducting business. It also offers knowledge and skills needed to develop individuals to be digital entrepreneurs where students are

exposed to various online media, social media and other platforms used by digital entrepreneurs nowadays (Azila, Nurul & Isrul, 2017).

Entrepreneurship as a subject in polytechnics aims to give students the exposure in developing their skills and interest in business. In this rapidly changing world, students need to be able to continually discover and explore opportunities if they are to thrive and progress after graduation. Some people are able to discover opportunities and successfully exploit them, something the student can aspire towards.

The knowledge acquired from learning will become important when they leave their polytechnic. Prior knowledge of a particular field provides individuals with the capacity to recognise certain opportunities (Shane, 2000) and the promise of financial reward "switches on" an individuals' "motivated propensity" to discover that opportunity (Kirzner, 1979). It appears that prior knowledge generates an intrinsic motivation to discover opportunities. Shane (2000) found that individuals who have developed particular knowledge were more likely to discover entrepreneurial opportunities in response to a given technological change. The previous study by Kolvereid and Moen (1997) found that as compared to other students, those who have taken a major in entrepreneurship revealed greater interest in becoming entrepreneurs and these students are more enterprising in their actions than other business students in term of taking up the challenge to start up a new business. Charney and Libecap (2000) reported that entrepreneurship graduates were 11% more likely than other business school graduates to own their own business. Entrepreneurship should be developed as a subject in higher education as it clearly plays an important role in cultivating students "entrepreneurial flair".

2.3 Entrepreneurship Lecturer Performance

Question how is the appropriate method to measure the performance of lecturers in the field of education and teaching often becomes a major issue among researchers. According to Worthen and Sanders (1973), there are many versions and field research to find out the most appropriate method to measure the performance. According to Wachtel (1998), as cited by McKnight et al,. (2005), the issue of student evaluations in teaching is not a new issue as it was started in the 1920's.

Lecturers' performance in education and teaching is a standard for performance unit in score obtained from lecturers on the implementation of their professional duties as teaching staff indicated from teaching plan, teaching activity, material mastery, class management, communication skill with students, discipline and grading the students learning performance measured based on the assessment conducted by the university students (Halim, 2009).

A study of students' perceptions of effective teaching and learning in business universities was carried out by Abdul Hamid and Pihie (2004). Their findings to verify that the lecturers exhibited qualities in all the following constructs under study, namely the lecturers' characteristic, teaching methodology, and course relevance. Another study of teaching effectiveness was carried out by Chua and Kho (2015) at a local Teacher Education Institute. The survey data revealed that the five teacher attributes which had high scores were related to the ability in conducting teaching learning activities, providing awareness on the development of human capital, commitment towards teaching and learning, monitoring and giving feedbacks, and motivating students to pursue learning activities.

Previous measurements based on Mat Daud and Abu Kassim (2011) examined student rating of teaching effectiveness at International Islamic University, Malaysia. It have shown that the questionnaire that they used managed to identify lecturers that needed in-service training. Other interesting findings include the difficulty in keeping class interested and getting students' participation in class activities. At Universiti Putra Malaysia, Safavi, Abu Bakar, Ahmad Tarmizi and Alwi (2012) conducted a study to investigate the perceived utility of ratings information of 1139 academics. Some of the findings revealed that the majority of the lecturers were in agreement on these points: 1) instructional performance should be evaluated by students, and 2) student ratings were taken seriously. On the suitability of the questionnaire, some of the suggestions by the lecturers include the following: 1) a revision of the questionnaire items, and 2) allowing of additional items related to their courses, specifically concerning course objectives and teaching methods.

In measuring the quality of the delivery of instruction, some research findings have shown that students are in the best position to provide feedback (Coughlan; 2004; Kwan, 1999). There have been many studies of student ratings to the Performance of lecturers in the field of education and teaching. Hill, Lomas and MacGregor (2003) investigated students' perception of quality education and discovered that students appreciated lecturers who are well organized and knowledgeable in their subjects. Similar results were obtained by Voss and Gruber (2006) where students prefer teachers who are knowledgeable, enthusiastic, approachable, and friendly. While, the performance of lecturers in the field of education and teaching represent the performance achievement in performing their roles of teaching profession. The

performance achievement is measured through the following aspects: (1) teaching planning (2) teaching activities (3) material mastery (4) classroom management (5) communication skill with student (6) discipline and (7) teaching evaluation (Lucky & Yusoff , 2015).

Nevertheless, many studies have attempted to explore the contributing factors to student evaluation on lecturer performance in both public and private higher education institutions. Many authors agree that there is no specific instrument to measurement teaching performance but as in previous studies of (Griffin, 1999; Liaw and Goh, 2003) express that student evaluation is included in the key performance index for lecturers in staff appraisal and teaching effectiveness. Another view from (Reckers, 1995), through student evaluation as student ratings is perceived as an unreliable and inaccurate method for teaching assessment by the majority (about 75%) of academics.

Halim (2009) further noted that to effectively examine lecturers' performance in education and teaching, students should be utilized as the respondents as they are the only people who can effectively evaluate their lecturers. Miller's study (as cited in Halim, 2009) noted that there are proofs that university students can fairly assess lecturers' teaching performance. By doing so, the results will be more objective than if the dean or rector or Vice Chancellor does.

Based on the gap shown in the problem statement section, the researcher decided to using the entrepreneurship as a subject, in doing so, this research find out the literature about the teaching entrepreneurship field, this is based on finding of previous studies made by Dilts and Fowler (1999), review that teaching performance (traineeships and

field learning) is also a measure of a person's success compared to other educators provide students more competitive entrepreneurs.

However, it should be stressed that entrepreneurial activities and programs was predicted approximation to measure intentions and entrepreneurial competency rather than on demographic factors, personality factors and other situations (Schout & Harkema, 2010; Fayolle et al., 2006).

In the report program action plan by Department of Polytechnic Education, (2010), can be expressed more simply as held an activities that strengthen staff competencies, including social visits, a course trainer, coaching, mentoring, a job attachment program in SME's or industry, seminars or workshops, invited lecturers or speakers who are successful entrepreneurs or experts, with the aim of developing networks and creative business ideas to increase knowledge and new skills among the lecturer. So, they need more methods to evaluate the lecturer performance of an effectiveness entrepreneurship teaching.

According to Yilmaz and Bayraktar (2014), the lecturers' more frequent use of ICTs could influence their levels of innovativeness. In addition, it is emphasized in literature that the innovative image of an organization, individuals' perception of innovation and the duration of individuals' interaction with technology all influence their adoption or refusal of technological innovations (Brahier, 2006). Depending on this, it could be stated that one of the important variables that lead to educational change and innovation involves increasing and spreading the opportunities for lecturers' use of technology.

The result contradicts the findings of Norasmah (2002), that a person should develop deep knowledge in entrepreneurship after becoming involved and receive more exposure through education or training in entrepreneurship at the classroom. Many authors agree that the educators must develop their own entrepreneurial skills before they can teach these skills to students (H.Rasmuna, 2012). This is proven by Salleh (2002), which is focused on the role of lecturer at Malaysian universities.

In this study, the researcher will used the cognitive ability which is the capabilities related to the acquisition and application of knowledge in problem solving, According to Fleishman et al,. (1999), general cognitive ability has a strong positive effect on task performance. The reason in this research focused on cognitive ability because it's the most relevant of ability across all the jobs, including to analysis the entrepreneurship educators' performance in innovation.

To explain more about general cognitive ability relates to task performance, Hunter and Schmidt (1988), able to gain more knowledge from their experiences at faster rate, and a result, they develop a bigger pool of knowledge regarding how to do their job effectively. This cognitive ability plays an important role in determining how effective the lecturer is at different field of knowledge to teaching their students.

There are also numerous research that investigate the variables that may correlate with student ratings of teachers. It is well known that laboratory work received higher ratings than lectures or tutorials, (Beran & Violato, 2005). Most authors would interpret this as hands-on application of theory gave greater satisfaction, and thus received higher ratings for instruction. Cashin (1995) can be traced that instructors

teaching certain disciplines tend to receive higher student ratings than instructors in other disciplines while, arts and humanities courses normally get the highest ratings. Compare similarly, mathematics, engineering and physical sciences courses get lower ratings probably due to the perceived difficulty of these courses.

A number of specific examples are given in the research, however found that the lecturer, and not the course, as the primary determinant of students' ratings (Marsh, 1984). This finding was based on a study where in this research categorized student ratings data into four categories: (1) the same lecturer teaching the same course but in different semesters, (2) the same lecturer teaching a different course, (3) different lecturer teaching the same course, and (4) different lecturer teaching different courses.

There are numerous examples of other researchers like Braskamp and Ory (1994) also McKeachie (1979) argued that higher ratings were given by students to elective courses as compared to core courses. According to Marsh & Dunkin (1997), teachers were more likely to receive higher ratings in classes where students had a prior interest in the subject matter. Students who exceled in their courses were also found to have given high ratings when evaluating teacher effectiveness (Greenwald, 2002). Research on the relationship between course workload/subject-matter difficulty and student ratings had produced mixed results. Marsh & Roche (2000) found a positive and direct relationship between workload and student ratings, contradicting findings by Centra (1993) and Greenwald (2002) who reported lower student ratings when the assessment given by lecturer was high.

From the literature, in this research decided to use a measurement based on method of entrepreneurship lecturers' performance in term of an effectiveness teaching factors. Social integration such as good communication to students, the frequency of use a modern technology while teaching and learning and the participation of student status. As mentioned by Halim (2009), to determine the students as respondents for evaluate teaching performance after the end of the program, students should be utilized as the respondents as they are the only people who can effectively evaluate their lecturers in classroom.

2.3.1 Identifying the Variables in Entrepreneurship Teaching Performance

It is important to identifying more about the relationship between the variables of teaching performance because it is a key to integrate those variables into a meeting point, so that in this research can get an effectiveness data which is will give the major impact in this field of the study.

Next section, in this research can conclude the evaluation of performance in a specific domain of teaching activity, whereas competency of performance is a class of things that can be used to characterize individuals and their behaviors. In opinion by Hayton and McEvoy (2006), suggest that there is a further level of confusion that arises from indiscriminate use of terms such as skills, knowledge, and attitude, alongside competencies. Their position is that the unique characteristic of competencies is that competencies are interactional constructs. In other words, they have three parts: individuals' differences, situational defined behavior, and socially designed criteria for performance. Competences are distinct from knowledge, skills, and attitude in that

they are not only attributes of individuals, but also depend on situation and social definition.

Few topics in education have captured as much attention from policymakers and practitioners as the connection between the performance of lecturers in the field of education and teaching with student achievement. The research has clearly shown that quality teaching matters to student learning. Lecturer quality has been consistently identified as the most important institutional-based factor in student achievement (Hanushek, Kain, & Rivkin, 2000; Rowan, Correnti & Miller, 2002) and lecturer effects on student learning have been found to be cumulative and long-lasting (Kain, 1998; McCaffrey et al,. 2003).

However, researchers continue working to straighten out important aspects of these relationships, including the specific ways in which quality teaching operates, the degree to which it drives learning, and how effectiveness evolves as lecturer's progress through their careers. In addition, the field is still seeking clarity about how to develop, measure, and sustain lecturer teaching performance. This ongoing research attention is paralleled by momentum at the federal policy level, particularly efforts to strengthen accountability for lecturer quality (Kuang, 2004) and, most recently, to define lecturer performance in term of teaching based on growth in student evaluations.

The topic is not a new one; however, in this research have been examined extensively in the literature and found that from the point out that communication skills are important for innovative teaching (Ha & stoel, 2004;Koster, 2005), investigating their

personality characteristics from a theoretical perspective (Rogers, 1995; Hong Jon-chao et al., 2011).

In the literature, some of lecturers' effectiveness factors for lecturer professional development are put forth, such as pedagogical skills knowing the Student, Monitoring and Evaluation of Learning and Development, Knowledge of Curriculum and Content, Teamwork, Communication, Problem solving, and Understanding the culture (Koster, 2005; Runco, 2003).

However, there is very limited research trying to investigate the core factors underlying lecturers' performance in entrepreneurship teaching. By reviewing related literature and integrating the main findings and results from previous research, we postulate that four core factors are considered important to underline lecturers' performance in entrepreneurship teaching: innovative teaching method (Fatoki, 2014; Mwasalwiba, 2010), Educational teaching tools, (Sánchez, Cortijo, & Javed (2014); Mazman, & Usluel, 2010), Lecturers' learning capabilities and Lecturers' social integration (Zhu et al., 2013).

So that, all the identified independents variables in this study namely, innovative teaching method, educational teaching tools, lecturers' learning capabilities, lecturers' social integration had been recognized and will be analyses the methodologies in chapter 3, about relationship between entrepreneurship lecturer performance (as a dependent variables) and the measurement of moderating effect on innovative work behavior will be conduct by researcher to investigate the strength of their relationship together.

Table 2.1 shows several empirical findings about the factors in teaching performance was reviewed previously.

Table 2.1
Empirical Findings about the Factors in Teaching Performance

Literature	Factors in Teaching Performance	Core Factor	Related to the Proposed variables in this research
Koster (2005)	Domain-Specific Knowledge, Organization, Pedagogy, Attitude, Communication understanding the culture.	Pedagogical/ Educational Social	IM SI
Jon-chao hong et al., (2008)	Management ability, professional Capability interpersonal skills, value systems mental capability, personality traits	Pedagogical/ educational Social Thinking, General	IM SI LC
Rogers, 1995; Ha & stoel, 2004; Sahin&Thompson, 2006	Communication skills high imagination, enjoy trying Innovations, inventive personality	Social Thinking	SI LC
Kuang, 2004	Social attributes	Social	SI
Simplicio, 2000	Innovation can be acquired and nurtured	Learning	LC
Karwowski &Gralewski, 2007	Stimulate students' creativity dynamic, open competent	Pedagogical/ educational Social General	IM SI LP
Chen, 2002	Advanced ideas of education, high professional level and teaching ability quick thinking, and imaginative good moral character, personality	Pedagogical/ educational Learning General	IM LC LP

Continued Table 2.1

Literature	Factors in Teaching Performance	Core Factor	Related to the Proposed variables in this research
Jin, 2008	Lofty professional spirit, new educational belief, complete knowledge structure, superb teaching art, skillful modern educational Technology	Pedagogical/ Educational Technological	IM ETT LP
Zhang, 2000	Study ability, social communication ability	Learning Social	LC SI LP
(Marks, 2000)	Identified five dimensions: organization, workload, expected grades, teacher's concern, and learning.		LC IM LP
Hannon, 2008	Able to use educational technology	Technological	ETT LP
Struyven & De Meyst, 2010	Responsibility for the learner responsibility for the school and educational community, Responsibility for society	Pedagogical/ educational Social	IM SI LP
(Kim, Damewood, & Hodge, 2000).	Communication skills, attitude toward the students, knowledge of the subject, organizational skills, enthusiasm, fairness, flexibility, and encouragement of students		LC LP

Continued Table 2.1

Literature	Factors in Teaching Performance	Core Factor	Related to the Proposed variables in this research
UNESCO, 2008	Aware of and be able to apply the Basic and complex tools(e.g. Computer, software, and network Resources) to help students Collaborate, access information, communicate, and create information ; Be able to design ICT-based Knowledge communities and use ICT To support the development of Students' knowledge and skills	Technological	ETT LP
R Rama, S. (2011).	The measurable parameters for this study are: examination of the international professional's efforts for implementing reforms; surveys on professors and students satisfactions with the higher education system; and personal communications.	Teaching role, social integration, Learning capability .	SI LC LP
(Toland & Alyala, 2005)	Instructor delivery of course information, instructor-student interaction, and regulation of students' learning		ITM LC SI LP
(Gursoy & Umbreit, 2005)	Identification of four dimensions: organization, workload, instruction, and learning	Learning General Teaching Method	LC IM LP

Continued Table 2.1

Literature	Factors in Teaching Performance	Core Factor	Related to the Proposed variables in this research
(Marsh & Roche, 1997)	Identified nine dimensions: learning/value, enthusiasm, organizing, group interaction, relationship with students, extent of coverage, examination and grading, assignments, and workload/difficulty.		LC LP SI IM
(Jackson and et al, 1999)	Identified the following six factors: relationship with students, course value, organization, grading, difficulty, and workload.		SI LP
(Gursoy & Umbreit, 2005)	Identified four factors: learning instruction, organization, and workload as effective teaching measures.	Learning General Teaching Method	IM LP
Cohen &Levinthal, 1990	Technological competencies	Technological	ETT LP
(Badri, Abdulla, Kamali, & Dodeen, 2006)	Identified five factors of teaching effectiveness: knowledge and performance in teaching, grading, and overview of the course, requirements/efforts, and course outcomes.		LP IM

LP= Lecturer Performance, IM=Innovative Method, SI=Social Integration, LC=Learning Capability, ETT= Educational Technological Tools

2.4 The Relationship between Innovative Method and Entrepreneurship Lecturer Performance

Technology-based teaching and learning tools are now dominating the world of education in order to encourage entrepreneurial intention among students and to provide a great support of students' learning process (Roblyer, 2006). In the past, traditional approaches in education have resulted to a mismatch between "what is taught to the students" and "what the industry needs" (Radianto, & Santoso, 2017). Entrepreneurship education generally aims to increase the awareness of entrepreneurship as a career option and enhance the understanding of the process involved in initiating and managing new businesses (Lee & Wong, 2007; İlhan & Gurel, 2011).

The various backgrounds of audiences of entrepreneurship education programme include students from different socio-demographic characteristics, involvement, and aspirations, hence a range of courses are offered to cater these differences, for example to students of scientific, technical, and literary background, or even to teachers and postgraduate students. According to Bennett (2006), active or innovative method requires instructors to facilitate learning, and not to control or restrict any methods that enable students to become more dynamic, inquisitive, and all-rounder.

Traditionally, there are three most used methods in teaching and learning, namely lectures, case studies, and group discussion (Bennett, 2006). Nevertheless, (Wahid & Hashim (2017) argued that these methods are passive and less effective in influencing the attributes of entrepreneurship.

(Fiet, 2000; Norria, 2016) explained that instructors typically use lecture-based methods in teaching and learning because they are relatively easier to be accomplished and require less investment. Other methods that can also be used are computer game simulation, film or video presentation, role model or guest speaker, business plan creation, project work, competition, study visit, as well as the setting of real small business ventures and workshops. These methods are more appropriate in order to nurture entrepreneurial attributes among participants (Mwasalwiba, 2010; Huq & Gilbert, 2017).

Most researchers in the past classified teaching methods into the following categories: case study, group discussion, individual presentation, individual written report, group project, formal lecture, guest speaker, action learning, seminar, web-based learning, and recorded video (Carrier, 2007; Hindle, 2007; Fayolle, 2007; Fayolle et al., 2008; Lonappan et al., 2011). In addition, Solomon et al. (2002) highlighted that the most popular teaching methods in entrepreneurship education are the creation of business plan, case studies, and lectures. Different pedagogies in entrepreneurship classrooms assist student in developing entrepreneurial skills (Neck and Greene, 2011), and most of the studies on the effectiveness of entrepreneurship education previously focused on the viewpoint of academics. In this case, it is nevertheless important to obtain and understand students' perceptions (Gerba, 2012).

On the other hand, Mwasalwiba (2010) stated that researchers categorise the teaching method of entrepreneurship into two groups: traditional method (i.e. normal lecture) and innovative method (i.e. action-based). These two are also known as passive

method and active method respectively. The right combination of the two primary teaching methods greatly improve entrepreneurship education.

Kirby (2004) argued that most entrepreneurship educators that relate their courses with the creation of new ventures actually successfully end up teaching about entrepreneurship. Also, teaching methods that are able to improve individuals' knowledge and skills are those that can positively be associated with increased entrepreneurial motivation, innovation, and the capability to understand how to start and sustain a new business venture (Kirby, 2006; ; Blenker, Dreisler & Kjeldsen, 2006; Shambare, 2013).

Next, Laukkannen (2000) identified two areas of entrepreneurship education. First, "education about entrepreneurship" involves developing, constructing, and studying the theories related to entrepreneurship, firm creation, and the contribution of entrepreneurship to economic development. Second, "education for entrepreneurship" presents the potential entrepreneurs with entrepreneurial process by providing all the tools necessary for the start-up of new ventures both from the inside and outside of existing organizations. Education about entrepreneurship is mainly based on the construct and transference of knowledge about the field, while education for entrepreneurship focuses on the learning experience and the development of competencies, skills, aptitudes, and values. There are various teaching methods that can be used for both areas.

Entrepreneurship education, according to Hannon, Collins, & Smith (2006). produces different short-term and long-term outcomes in the society. It wide variety of audiences, learning objectives, content, and pedagogies (Fayolle et al., 2008). In the short run, the goals are as follows: (i) to create awareness; (ii) to instil knowledge and understanding about entrepreneurial concept and practices; (iii) to develop individual's entrepreneurial skills, characteristics, and positive attitude such as self-confidence and self-resilience; and (iv) to motivate and inspire students to be highly involved in the process of venture creation (Hannon, Collins, & Smith, 2006).). On the other hand, in the long run, the goal is to expect changes in attitude, culture, support system, and business ventures created by youth (Azizi, 2009).

Entrepreneurship education programmes have different objectives that can either be specific or general and complex. The identification of various objectives of entrepreneurship education provides a deeper understanding of educational needs, hence greatly help the educators to choose the right pedagogies when teaching (Alberti et al., 2004). Inappropriate teaching methods will certainly give negative impacts on the outcomes of entrepreneurship education. Peterman and Kennedy (2003) and Pihie and Sani (2009) noted that a good and comprehensive teaching program helps to develop capable and skilled entrepreneurs.

Knowledge on how to plan and implement a business idea, together with the process of establishing an enterprise should motivate students to think about setting up their own business and as a result, bring them closer to entrepreneurship (Venesaar, 2008). It is crucial to ensure that students enjoy learning about business and eventually have

the intention to become entrepreneurs themselves. In this case, the choice of teaching methods depend mainly on the learning objectives, content, and target audience. Problem-based learning is one of the best methods in entrepreneurship education, and in order to experience an effective entrepreneurship education, a combination of teaching methods can be used. A good evaluation of curriculum and pedagogies in entrepreneurship programmes allows the educators to successfully implement the teaching and learning practices (Zarasti, 2012).

The Consortium of Entrepreneurship Education (2013) observes that entrepreneurship education seeks to prepare people, especially youth, to be responsible, entrepreneurial individuals and thinkers who become entrepreneurs and contribute to economic development and sustainable communities. Entrepreneurship education is not only about teaching how to run a business, but it is also about encouraging creative thinking and promoting a strong sense of self-worth and accountability. The core knowledge created through entrepreneurship education includes the ability to recognise opportunities, and pursue such opportunities by generating new ideas and employing or managing resources via critical and creative thinking. Entrepreneurship education is associated with opportunity recognition, venture creation, and growth. This is consistent with the view of Klein and Bullock (2006) who argued that entrepreneurship education should include the management of existing resources, the acquisition of new resources, the identification of existing opportunities, and the creation of new opportunities.

Hytti and O'Gorman (2004) argued that there are many ways to offer entrepreneurship education and this depends on the objectives of such education. If the objective of entrepreneurship education is to increase the understanding of what entrepreneurship is about, the best way to accomplish the objective is to provide information through public channels such as media, seminars, or lectures. However, if the objective is to equip individuals with entrepreneurial skills, which are applicable directly to work, the best way is to provide education and training that enable individuals to involve directly in the entrepreneurial process, for example through industrial training. Furthermore, if the objective of entrepreneurship education is to prepare individuals to act as entrepreneurs, the most effective technique is to facilitate experiments by trying out entrepreneurship activities in a controlled environment, for instance through business simulation or role playing. Thus, the present study suggests the following hypothesis:

H1: There will be a positive relationship between innovative method in teaching and the performance of entrepreneurship lecturers.

2.5 The Relationship between Educational Technology Tool and Lecturer Performance

Online communication tools provide ease of communication between educators and students (Bharucha, 2018; Mori, 2007). The majority of higher education professionals communicate course content through e-mail and/or learning management system such as Desire2Learn, Blackboard, Moodle, WebCT, among others. The advent of social media has provided a wide array of student-instructor communication and teaching and learning tools (Greenhow, Robelia, and Hughes, 2009; Junco, 2015). However,

most educators these days use social media for personal reason hence making some of them feel slightly hesitant to use social media as a teaching and learning tool although there are many benefits that can be gained, particularly in terms of supplementing their institutes' learning management system (Moran, Seaman, and Tinti-Kane, 2011; Cloete, De Villers, and Roodt, 2009; Manca and Ranieri, 2013; Nemec, Holb, Burkeljca, and Welzer, 2011; Said, Tahir, and Ali, 2014).

Several authors posited that social networks or social media are interactive, educational in nature, and able to foster academic benefits (Kabilan, Ahmad, and Abidin, 2010; Lockyer and Patterson, 2008; Mazman and Usluel, 2010; Roblyer et al., 2010; Souleles, 2012). Nevertheless, it requires educators to decide whether reaching all students is more important than maximising overall engagement. For example, a detailed understanding of class demographics with respect to the number of students stay active on social media can help educators to define the right platform to be used in order to optimise independent engagement.

Interestingly, both levels of engagement with students, formal and informal, are positively correlated with academic performance (Carini et al., 2006; Kirschner, 2015). Here it shows that there is no evidence of the existence of young students equipped with advanced technology skills and with learning preferences for which education is not prepared (Bennett, Maton, and Kervin, 2008; Jones and Shao, 2011). In this sense, Hargittai (2007) found that the use of social networks among young people depend on the individuals' gender, race and ethnicity, and parental education background. Thus, before making radical changes to the current education system, it is necessary to undertake rigorous and empirical studies that investigate students' perception of social

networks as an educational technology tool. Bowers-Campbell (2008) explained how educators can use Facebook as a tool to communicate with their students, as well as to increase self-efficacy and self-regulated learning by improving the communication between instructors and students.

2.5.1 Facebook as a Teaching and Learning Tool

Next, in terms of using the internet and technology to experience an effective teaching and learning process, social networks are currently used by millions of users around the world; most of whom are students with multiple different purposes (Lenhart and Madden, 2007; Selwyn, 2007). Facebook is one of the most popular social networks, in which besides its primary function to connect people, it can also be considered as an educational tool for its superb qualities such as enabling peer feedback, goodness of fit with social context, and an interactive tool for people of different backgrounds (Mason, 2006). It can be deduced that Facebook highly encourages active participation and collaboration among its members. The majority of Facebook users are university students between the age of 18 and 25 years old (Bumgarner, 2007).

Next, Sacide and Yasemin (2010) explained how users can utilise Facebook for educational purposes. It is a social media platform that can be used as a teaching tool, for example by using Facebook live, recorded video, and status, notes, or posts that appear in the newsfeed for other users to watch and read. It is highly suitable due to the increasing attention it receives as an effective educational technology tool, in which college students were reported to have used Facebook significantly everyday (Aydin, 2012). However, the uneven access of Facebook at some parts of the world

creates barrier for a universal communication and outreach for the entrepreneurship educators (Bosch, 2009).

Sánchez (2014) was consistent with Mazman and Usluel (2010) in a research where students from the University of Huelva are enthusiastic about using Facebook to interact with their friends, relatives, and classmates. This enthusiasm has a positive influence towards their perception on Facebook as an educational tool. Studies have reported that Facebook serves well as an informal learning environment rather than a formal environment (Cain and Policastri, 2011; Chen and Bryer, 2012). Despite the significant increase in the number of papers examining the potential benefits of Facebook as education platform, the ECAR Survey of Undergraduate Students and Information Technology (2012) concluded that more than a quarter of students who participated in survey said they would like to see a greater use of social media in their courses (Smith and Caruso, 2010; Junco, 2012a). As Yang, Wang, Woo, and Quek (2011) claimed, after conducting a comprehensive literature review, it is necessary to conduct more empirical research on the use of Facebook as an educational tool. Meanwhile, Kalin (2012) stated that before the benefits of technology can be achieved, the way how students use the technology itself must be understood.

Facebook can be used to create, promote, and foster online connection between students and faculty within an academic community (Mazer et al., 2007). This increase in communication has a positive impact towards classroom discussion, and student engagement with peers (Christofides, Muise, and Desmarais, 2009; Ross et al., 2009). McCarthy (2012) revealed that students considered Facebook as a valuable learning

resource that improves the development of their academic connection, as well as promotes academic discussion and criticism.

Several studies explore the potential of Facebook as a learning resource that promotes collaborative and cooperative learning (Irwin, Ball, Desbrow, and Leveritt, 2012; McCarthy, 2012). Irwin et al. (2012) developed Facebook pages for four university courses to analyse students' perceptions of Facebook as an interactive learning tool. Students were shown to be in favour of using Facebook for academic purposes and stated many reasons for the courses' Facebook pages being an effective learning resource, such as increased interaction and participation about topics in a particular course, and a good exposure to relevant media and learning materials. However, some concerns were raised about the need of the courses' activities to be updated in Facebook (Irwin et al., 2012).

Clements (2015) suggested that Facebook can be used to enhance independent student engagement. Ultimately, using technology to elevate student engagement fosters a positive intellectual and emotional learning attitude, namely enhancing academic achievement and critical thinking, as well as imposing a lasting impression on students' academic experience beyond the scope of score achievement (Carini, Kuh, and Klein, 2006; Fredricks, Blumenfield, and Paris, 2004). Engaging with material and discussion through educational online tools can aid in the development of student reflection and critical thinking (Burge, 1994; Whipp, 2003; Barnett-Queen, Blair & Merrik, 2005; Zheng, Warschauer, Lin & Chang, 2016). In addition, Facebook was found to be useful according to a study conducted by Wang, Lin, Yu, and Wu (2013),

but without a proper guidance from instructors, Skues,Wise, and Williams (2017) argued that Facebook cannot promote academic engagement.

Nonetheless, Kirschner and Karpinski (2010) reported that Facebook use among students resulted in lower academic results and time investment into academic endeavours. Junco (2012b) posited that increased time spent on Facebook is negatively associated with engagement scale scores, although he noted that different aspects of Facebook resulted in different impacts (positive or negative) on student engagement. Furthermore, since students prefer the educational use of social media to be informal (Cain and Policastri, 2011; Chen and Bryer, 2012), On the other hand, Facebook is used to optimize an independent, extra-curricular student engagement. However, the efficacy of Facebook for enhancing the independent engagement of university students outside of core course requirements has yet to be quantitatively assessed.

2.5.2 Privacy Issue Related to Facebook

Cain (2008) and MacDonald, Sohn, and Ellis (2010) discussed about the issues of Facebook's privacy policy although over time, Facebook continues to improve its regulations in terms of sharing and disclosing information (Christofides, Muise, and Desmarais, 2009). Privacy is usually of higher concern when it comes to academic property among higher education professionals (Cain, 2008; Christofides et al., 2009; Debatin, Lovejoy, Horn, and Hughes, 2009). In addition, other social networks like MySpace, Friendster, YouTube, and Flickr are useful as a teaching aid due to the open learning concept, in which users can share photos, personal information, and learning content such as videos and notes (Ajjan and Hartshorne, 2008; Mejias, 2005).

The ease of use of Facebook allows users to establish a spontaneous learning ground, thus supporting the teaching and learning process informally and more interactively. Ease of use is defined as the extent to which a person believes that using a system is free of effort (Davis, 1989). A vital factor influencing the use of Facebook is the combination of a user's technical skill and his or her competence in the peculiar features of Facebook such as photo and file upload/download, profile edit, as well as different functions of menu and settings. In this study, ease of use is defined as using and managing Facebook features and its contents easily without much effort. On the other hand, usefulness is the extent to which a person believes that using a particular system enhances his or her job performance (Davis, 1989). Usefulness is also defined as the extent to which an innovation is perceived as better than its precursor (Rogers, 2003).

2.5.3 Facebook as a Social Influence

Social influence is how an individual opines or perceives about how others judge a particular individual's behaviour (Fishbein and Ajzen, 1975; Venkatesh, Morris, Davis, and Davis, 2003). It is also a social factor that is defined as an individual's internalization of a reference group's subjective culture and a specific interpersonal agreement that the individual has made with others in a specific particular situation (Triandis, 1980; Thompson et al., 1991). Facebook is a utility used by many people, hence social norms do play a significant role in an individual's use of this educational tool. Facebook enables people to communicate, collaborate, and share information.

There are four themes highlighted by Selwyn (2007a) when students use Facebook in educational contexts, namely (i) recounting and reflecting on their university experience, (ii) exchanging practical information, (iii) exchanging academic information, and (iv) exchanging humorous or entertaining materials. In addition, Arteaga (2014) showed that students are inclined to use Facebook for learning because it is used by their friends. In response to this, perceived compatibility with students' values, needs, and past experiences is another variable that has a positive impact in the adoption of Facebook.

Although Facebook was not originally designed for educational purpose, it has a great potential to enhance the learning experience. Facebook can promote collaborative models of learning, connect students and instructors, increase learners' motivation level, and create a more comfortable classroom climate (Goertler, 2009; Mason, 2006; Mazer et al., 2007). It also creates a strong community of practice for teaching and learning that expands the learning process beyond the boundary of a traditional classroom (Hwang, Yang, & Wang, 2013; Yang et al., 2011).

Despite the endless possibility offered by Facebook to enhance learning experience, lecturers must plan the learning process very carefully, in which they must be clear and articulate in the course objectives, learning goals, and students' expectations. In addition, lecturers must design and coordinate teaching activities that engage students and require interactive participation, focusing on concepts and insuring that the students understand the material (Tay and Allen, 2011).

Although most often viewed as a social tool rather than a formal educational tool (Greenhow and Robelia, 2009; Selwyn, 2009; Usluel and Mazman, 2009), Facebook is beneficial to educators in various ways. For example, Facebook can act as a rapid avenue of communication between educators and students, with students often receiving instructor and classmate messages through Facebook quicker than through other online communication platforms (Sturges, 2011). The high degree of familiarity that students have with Facebook also makes it an effective learning environment (Nemec et al., 2011) and helps students relate to course concepts in a more efficient and engaging way (Pemberton, 2011). Furthermore, educational benefits of Facebook do exist in certain situations, although challenges are evident as well (Souleles, 2012a; 2012b).The positive effects of Facebook on student engagement have also been documented by Wang et al. (2013) and Esteves (2012). On the other hand, negative impacts of Facebook on engagement have been documented by others (Junco, 2012a; Wise et al., 2011).

Hence, using social networks in educational and instructional contexts can be considered as a potentially powerful idea because students spend a lot of time on online networking activities. For example, while the current generation of Learning Management Systems (LMS) allows each student to have their personally chosen courses in which they are enrolled, many of these LMS lack of social connectivity tools and personal profile spaces that can be used by the students involved. In contrast, students today demand more autonomy, connectivity, interaction, and socio-experiential learning opportunities (McLoughlin and Lee, 2007). Thus, the present study suggests the following hypothesis:

H2: There will be a positive relationship between educational technology tools and the performance of entrepreneurship lecturers.

2.6 The Relationship between Lecturers' Learning Capabilities and Lecturer Performance

To date there has been little agreement on the relationship between learning capability and teaching performance. Chen (2002) highlighted that learning capability is important for innovation teaching performance, while Zhu et al. (2013) indicated that learning capability is not a significant predictor in teaching performance. However, Konings et al. (2007) said that this seems to be inconsistent with previous argument that lecturers' willingness to learn is a crucial factor in implementing educational innovation. Although lecturers' willingness and capability to learn is important, the entrepreneurial environment is more supportive in their actual performance in innovative teaching.

Ismail (2013) pointed out that there are some methods in entrepreneurship that can be taught effectively in Malaysian polytechnics. The finding confirmed that polytechnic lecturers are still not imbued with the capabilities of learn something new in the teaching of entrepreneurship. Hence, this study also examines the relationship between lecturers' learning capabilities and innovative work behaviour as a moderator of teaching performance. This is in line with Smilor (1997) who mentioned that "effective entrepreneurs are exceptional learners". They learn from everything around them. They acquire knowledge from other entrepreneurs, their customers, suppliers,

competitors, employees, associates, et cetera. Experience also enriches their knowledge (Wu & Wu, 2017). Those are indeed the characteristic needed among educators of entrepreneurship education in the Malaysian polytechnics.

A study conducted by Milena Valenčič Zuljan (2016) on lecturers' pedagogical practice has raised an important question: to what extent has the lecturer prepared themselves for changes in their own pedagogical practice? In forming lecturers' attitudes in being innovative towards their pedagogical practices, the education of lecturers plays a significant role particularly in terms of content and method. Lecturers should be able to undertake research that enables systematic gathering of data about the implemented innovation with the aim of providing valuable a judgment regarding the innovation and/or providing a basis for improvement. On the other hand, a successful innovating teaching is primarily derived from constant practice and with the help of experts (Fullan, 1982; Valenčič Zuljan, 1993).

Thus, lecturers' learning capabilities construct is included in this study because current research has shown the need for this additional conceptualization (Hult et al., 2004; Zahay and Griffin, 2004; Weerawardena, 2003). Previously, Brookfield (2009) and Chien (2013), explained the meaning of learning capabilities: a learning process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. Meanwhile, Candy (2004) also explained that self-direction or learning capabilities involve the interaction between individuals and their

environment; knowledge is tentative, temporary, and socially constructed; learning is a qualitative shift in how phenomena are viewed; and individuals are engaged in complex, mutually interdependent relationships with their environment.

On the other hand, in a detailed investigation with children, Ball (1997) found it was impossible to determine how, and the extent to which, the understandings and insights expressed by children during interactions with her were supported by her implicit guiding and structuring. She argued that lecturers' sincere desire to help students and to believe that students have learned may lead them to ask more questions and discuss their learning experience in the class. Next, given a long-standing discussion of the relationship between general teacher aptitude and student achievement, it is important to consider how a particular measure of lectures' abilities is related to students' learning. Research in the past indicated that teachers' scores on tests of verbal skills such as vocabulary or word tests are related to the achievement of their students (Ehrenberg and Brewer, 1995; Hanushek, 1992; Rice, 2003; Wayne & Youngs, 2003).

Ferguson and Ladd (1996) discovered that teachers' composite scores on the ACT (a college-admissions test covering multiple subjects) are tied to student achievement. There is also evidence that the general cognitive ability of teachers as measured by an intelligence test that does not use verbal or mathematical skills is related to student performance. In addition, cognitive measures are more predictive of student achievement than any single measure alone (Rockoff, Jacob, Kane & Staiger, 2008).

Some studies showed a clear relationship between lecturers' licensure tests and student achievement. Standardized testing namely Praxis I and II is part of the lecturers' licensure process in 48 states and the District of Columbia (Editorial Projects in Education, 2010). Tests used for licensure consist of general academic skills, as well as knowledge of subject matter and teaching methods. For example, the Praxis I measures reading, writing, and mathematical skills. It is intended to help determine whether prospective lectures have the basic skills necessary for the profession. The Praxis II tests in Educational Testing Service, 2009 cover content-area knowledge in numerous subjects and subject-related teaching methods (Quellmalz, & Pellegrino , 2009).

On the other hand, Goldhaber (2005); Goldhaber, Lavery and Theobald (2015) found a positive relationship between lecturers' scores on certification tests, including the Praxis, and students' test scores in reading and mathematics, in which he concluded that certification test scores are strongly related to student achievement than degrees earned or some other measures. Other frequently cited studies also identified a relationship between licensure tests and student performance. Ferguson (2011) posited that there is a positive link between teachers' scores on the Texas Examination of Current Administrators and Teachers and their ability to help students achieve excellent scores. Based the aforementioned relationship in the framework, the present study proposes the following hypothesis:

H3: There will be a positive relationship between learning capabilities and the performance of entrepreneurship lecturers.

2.7 The Relationship between Lecturers' Social Integration and Lecturer Performance

The relationship between social integration and work performance among higher education professionals were mentioned in previous studies, in which they had positively improved their innovative thought once their social integration also improved (Koster et al., 2008; Pantic and Wubbels, 2010). Meanwhile, Lewis et al. (2013) indicated that social influence has a stronger effect on lecturers who use a particular technology in teaching, and innovative behaviours were mostly activated during effective communication, in which educators were found to be passionate, critical thinkers, and creative in the implementation of any teaching ideas (Koster et al., 2005; Pantic and Wubbels, 2010). Nevertheless, Mamat et al., (2015) and Mtebe and Raisamo (2014) indicated that social influence has no significant relationship or influence on behavioural intention.

Next, the educator participants in previous studies stated that good lecturers must have the ability to communicate with students from different backgrounds and cooperate with other colleagues to build a positive human relationship and get support from others for good teaching (Pantic and Wubbels 2010). In addition to being passionate about teaching, the ability to tolerate confusion and frustration, to relish a challenge, and not to give up prematurely are also needed for good teaching (Xiao-Jin, 2001; Bi, 2003; Hannon, 2008).

2.7.1 Critical Thinking in Teaching and Learning

Next, research on teaching in communication and collaboration skills encourage direct and mediated relationship, working with others on team projects, performance-based learning and assessment, and partnership for 21st century learning (2010). Critical thinking and problem-solving skills include the individuals' abilities to reason effectively, ask questions, solve problems, analyse and evaluate alternative perspectives, and reflect critically on decision and process. Trilling and Fadel (2009) supported this view by stating that critical thinking is the ability to analyse, interpret, evaluate, summarize, and synthesize information. They also mentioned that the lack of attention in developing creativity occurs as a result of a common misconception that creativity is only for those who are born with it. In response to this, Wegerif and Dawes (2004) mentioned that creativity and innovation are two elements in teaching that can be developed over time with the right and suitable practices.

2.7.2 Skills in 21st Century

The socio-cultural skills for 21st century refers to employees' ability to adapt and work well with colleagues, in which individuals must respect and embrace socio-cultural differences. This helps them develop new ideas and solutions to any issues or challenges at workplace. In this case, Charp (2000) Rakes and Casey (2002) stated that sometimes, the infusion of technology leads to educators fail to be well-prepared for the changes demand in the market. Also, Barnett (2003) stated that educators are usually eager to apply technology in their classrooms but they are lacking in skills and pedagogical knowledge to do so. In a different setting, Koster et al. (2005) stressed the importance of teachers' ability to communicate with their students and other

stakeholders at school. Meanwhile, Zhu et al. (2014) in their study posited that 86% of respondents stressed the importance of "communication skill" for innovative teaching, 43% of respondents stressed the importance of "cooperation ability" for innovative teaching, and 19% of respondents stressed the importance of "being courageous" for innovative teaching.

Next, 29% of respondents talked about the importance of "persistence", in which 43% of them argued that innovative teachers must have a democratic mind. Democratic means respect students, give the rights to students in class, and treat students equally. Meanwhile, Anderson and Messick (1974) mentioned that social competency is just one of many phrases to mobilize attention to a broad range of cognitive and personal-social dimensions. In this sense, the researcher of the present study examines the relationship between social integration and entrepreneurship teaching performance among lecturer. Hence, the research seeks to address the following hypothesis:

H4: There will be a positive relationship between social integration and the performance of entrepreneurship lecturers.

2.8 Innovative Work Behaviour

A construct that integrates both components as a set of 'innovation' tasks (Kanter, 1988).The innovative work behaviour term driven from the De Jong and den Hartog (2005); Konermann (2012) as self-initiated innovative behavior, which is a process in which new ideas are generated, created, developed, applied, promoted, realized, and modified by employees in order to benefit role performance.

It have to be accomplished for the successful development of an innovation is the construct of innovative work behaviour (Janssen, 2000; Scott & Bruce, 1994).There are three main reasons why innovative lecturer behavior in TVET instituitional is needed. First, innovative behavior is important in order to keep up to date with a rapidly changing society. The demands in our knowledge society are indeed increasing both for students and their lecturer (Brandsford, Derry, Berliner, & Hammerness, 2005). Second, upcoming new technologies and new insights about teaching require innovative behavior. Third, Polytechnics instituitional should set a good example and act as a starting point for more innovative behavior of the citizens so that society can stay competitive. After all, education is crucial to promote students' creative and innovative thinking (Shanker etc, al., 2017; Andiliou & Murphy, 2010).

In line with the mentioned two-stage models of creativity and innovation, four prerequisite innovation tasks, namely opportunity exploration or problem recognition, idea generation, idea promotion,and idea realization, can be derived from studies on innovative work behaviour (Sanz-Valle & Jiménez, 2018). De Jong &Den Hartog, 2010; Dorenbosch, Van Engen, & Verhagen, 2005; Janssen, 2000; Kleysen &Street, 2001; Scott & Bruce, 1994).

A domain in which innovations play a considerable role is TVET education (OECD, 2010). There is because work in TVET institutions is characterized by a close connection to the world of work, the effect of the above mentioned societal, economic, and technological developments is especially significant.

One of the key factors within the individual is self-efficacy (Bandura, 1977), which was shown to have a positive influence on innovative behavior. This finding aligns with Bandura's notions, as well as with many studies showing that self-efficacy is an excellent predictor of different kinds of human behavior (Van Dinther, Dochy, & Segers, 2011). Curiosity, attitudes, and beliefs positively influence teacher innovative behavior as well. Such beliefs are also generally considered to influence other types of behavior (Ajzen, 2012).

Innovations in TVET institutions can for instance be related to instructional design in the classroom such as new learning goals, to methods of learning and teaching, or to products and processes outside the classroom such as collaboration with companies and quality management at educational institution (Biemans et al., 2004;Mulder, 2004;).In spite of this expectation for teachers to be innovators, there is lack of insight into lecturers' contributions to innovation development (Messmann & Mulder,2011; Attwell, 1997).

Existing research on innovations in TVET rather focused on factors determining the implementation of externally designed innovations for the classroom context. However, in order for innovations to have a sustainable impact on processes and outcomes of work and learning in TVET institutions, it is expected that they establish links between the contexts inside and outside the classroom, and that they are developed in accordance with the goals and needs of a particular school context and by local actors such as TVETs' lecturer who work and learn in this context.

A theoretical conceptualization of innovative work behaviour is required that helps to overcome the addressed shortcomings of previous research by taking into account the construct's dynamic, context-bound nature. In particular, this conceptualization has to widen the construct's focus from being solely concerned with innovation development to an additional focus on lecturers' professional development. Employees' contributions to the development of innovations represent a valuable resource for gaining access to the benefits of innovations (Zhou & Shalley, 2003).

2.8.1 Innovative Work Behaviour As a Moderating Role

Innovation integration is a concept that deals with creativity, new ideas, or new methods of performing old and new tasks. Lecturers in higher education can be innovative if their students are unable to understand or acquire any knowledge using traditional teaching methods. Lecturers should welcome new ideas to be implemented on higher education lecturers to revamp or renew the dimensions of old concepts (Vrasidas and McIsaac, 2001). Meanwhile, "innovative work behaviour" refers to the new ideas of working methods introduced or passed down by either an individual or an organization (Yuan and Woodman, 2010). Continuous improvement, kaizen, corporate entrepreneurship, and suggestion programme are four common factors or innovative work behaviour (Fuller, Marler, and Hester 2006; Imai 1986; Chua, Sharma and Chrisman 1999; Unsworth 2001) Scholars have called for a more holistic research model in which innovative work behaviour is deemed as dependent, both moderating variable and independent variable (Battistelli, etc., al, 2014; Janssen, van de Vliert, and West, 2004).

Gilson (2008) and Gong, Huang, and Farh (2009) suggested that creativity is positively related to individual task performance. The creativity component of innovative work behaviour refers to generating novel responses that are useful in dealing with the task at hand (Amabile, 1996). Being creative at work includes developing new process or procedure for accomplishing tasks, refining existing tasks, or finding more effective alternative process or procedure (Gong, Huang, and Farh 2009). According to Gong, Huang, and Farh (2009), this should enable employees to enhance their individual task performance. Next, innovative work behaviour comprises the introduction and application of a better technology and work method (Yuan and Woodman, 2010). Although sometimes this may disturb job routine, causing resistance to change and stress reaction of employees (Janssen, 2003; Janssen 2004), in the end, it is supposed to lead to efficiency (Anderson, Rungtusanatham, and Schroeder 1994; Benner and Tushman 2003; Hammer and Stanton 1999).

On the other hand, innovative work behaviour, according to Janssen, van de Vliert, and West (2004) indicates individuals' modification and improvement to their work environment that involves methods, routines, and practices. Innovative work behaviour helps employees to adapt effectively to the job, thus leading to the anticipated task performance enhancement. Judge et al. (1999) found that effectively coping with changes is positively related to performance, thus supporting the argument above.

Technical and vocational education and training (TVET) students are preparing themselves for future roles, therefore the course delivered must be relevant and use advanced, modern medium like ICT to help students enhance their technical

competencies and skills once they enter the job market (Coutinho, 2007). In this case, lecturers can be innovative by providing up-to-date materials for the students with advanced knowledge application. Moreover, lecturers also must make their students understand their course requirement, procedure, and grading criteria. In the world outside of the classroom, intelligent activities often depend upon resources beyond the individuals themselves such as physical tools and notational system (Pea, 1993). Most of the tools do not only enhance cognition but they also transform it. For example, productivity tools such as word processor, spreadsheet, and database management system have fundamentally changed many tasks of the business world. Means (1994) argued that computers and other advanced technologies have the potential to transform teaching and learning experience at schools, and the focused areas are the availability of new technologies, frequency of use, and attitude toward computers.

Next, in terms of the readiness of computer use in education, Salomon (2007) made a distinction between performance tools which enhance or change how a task is accomplished, for example Facebook, word processor, or other pedagogical tool that focus on changing the users' competencies such as a simulation is designed to change a learner's understanding of an entrepreneurial concept. Although this distinction oversimplifies the complex interweaving of performance and pedagogical function, it is useful for organizing this research. The first considers tools that can support, enhance, or transform lecturers' work and then focuses on those explicitly designed to support lecturers' learning capabilities.

A number of studies on teaching effectiveness have been carried out by local researchers. Khairudin and Islam (2000) conducted a study at Ungku Omar

Polytechnic to investigate the use of Nominal Group Technique (NGT) in facilitating improvement in teaching and learning practices. Their study identified three specific areas for teachers' innovative teaching methods and delivery design skill such as good communication skill. A discrepancy analysis was used by Wan Kamaruddin and Ibrahim (2010) in identifying the competencies of polytechnic technical lecturers that needed enhancement. Using a sample of 401 technical lecturers from five Malaysian polytechnics, the authors discovered that the level of knowledge and the level of performance of these competencies were not on par with the level of perceived importance. The study also revealed that 12 professional competencies and six general competencies needed enhancement.

2.8.2 Focus Areas of Teaching Methods in Entrepreneurship Education

According to Briga Hynes (1996), teaching techniques should focus on three areas. First, the utilization of didactical methods like lectures, a stipulation of selected readings, textbooks, and seminar permitted for the stipulation of recent data that achieves the psychological feature objectives of the programme. Second, ability structure strategies are accustomed to generate effectiveness within the behaviour of scholars which end up in the improvement of existing skills and the development of latest skills. Third, discovery methods encourage learning through invention and experiential learning.

Ita Richardson and Hynes. (2008) projected that entrepreneurship and innovation should be delivered together using ICT content. Surveys conducted by Yep Putih (1985) identified the fact that experience helps a person to enrich their knowledge and

improve their efficiency at work. This is undoubtedly a solid proof showing that academic learning is less meaningful without additional real-life exposure for the students to acquire and become better in their studies and in the future. The effectiveness of entrepreneurship education needs to include communication, creativity, critical thinking, leadership, negotiation, analytical, social networking, and time management skills (Deakins and Freel, 1998; Down, 1999; Honig, 2001; Raffo et al., 2000).

In a study conducted by Klandt (1993), he discovered that teaching entrepreneurship has to involve various interesting techniques for example role-playing game, writing business plan, creating video, computer simulation, working with entrepreneurs, and getting students to join entrepreneurial club. Meanwhile, Bennett (2006) emphasized on the skills needed to run any businesses (Raven 1983; Hynes, 1996; Carayannis, Evans & Hanson 2003). Next, Ab. Aziz (1999) identified entrepreneurial activities taught or facilitated by entrepreneurship lecturers must be infused with the following skills: cognitive, interpersonal, conceptual, and communication. On the other hand, Solomon (2007) and Wilson et al. (2007) examined the trend of using technology as a teaching tool among speakers and discovered that the use of technology is highly significant to the modern world today in order to ensure the entrepreneurship education contents delivered to students are relevant.

Next, in a study about technopreneurship, Euginia Petridou et al. (2008) suggested that the field itself (technopreneurship) can be highly demanded and famous among technical graduates if the teaching methods, technologies used, and reading materials can effectively help participants to also acquire the right knowledge about running a

business. On the other hand, Henderson and Robertson (2000) showed that a group of researchers in the United States believe although not everyone can become entrepreneurs or be effectively taught on becoming entrepreneurs, students should still be taught about entrepreneurial skills such as being persistent, the ability to bounce back, and unafraid of taking risks. A comparative study of Garavan and Barra (1994) and Gibb (1993) showed that nowadays there are more studies focusing on the reformation of teaching practices. Kourilsky (1995) added by stating that American university curriculum contains three vital components in entrepreneurship, namely (i) recognition of opportunities, (ii) commitment to resources, and (iii) potential to design business operations.

Brockhaus (2001) traced that very little is known about effective teaching techniques to be applied by lecturers hence entrepreneurship research should be done in the teaching of entrepreneurship education. In addition to that, Do Bert et al. (2004) stated that universities need to encourage students to attend seminars and related events, while Charlotte Carey (2006) argued that in universities do not necessarily need to teach all aspects of the business. In this case, their business network is better in terms of preparing the students to face the real-life experience in business. Collectively, these studies outlined that there a number of critical methods in teaching and researcher should expand the studies about human behaviour and individual performance in teaching entrepreneurship. Furthermore, the integration of innovation in teaching can be done in the following five aspects: (i) the application of thoughts in teaching, (ii) the use of teaching performance and teaching strategies, (iii) the use of teaching

content, (iv) the use of teaching resources, and (v) evaluation (Chen, 2009; Ma, 2007; Tan, 2010).

The findings indicated that lecturers' learning capability is one of the key predictors for innovative teaching. This is in line with the argument that new educational beliefs, subject knowledge, as well as comprehensive and new educational knowledge are critical for innovative teaching (Chen, 2002; Jin, 2008). According to Chen (2002), Zhu et al. (2013) and Konings et al. (2007), there is no consistent research with previous argument that lecturers' willingness to learn is a crucial factor in implementing educational innovation between lecturers' learning capabilities and their teaching performance.

Thus, in order to investigate the relationship, the researcher of present study creates a hypothesis to know if there is a positive relationship between lecturers' learning capabilities and their teaching performance. Koster et al., (2005) stated that an innovative lecturer should have the ability to communicate with students from different backgrounds. The ability to communicate with students helps to enhance the work performance of lecturers to educate learners. Krueger and Carsrud (1993) concluded that teaching methods that include real-life experiences increase lectures' self-efficaciousness, while Volkman (2004) stated that teaching content is the most vital factor in the 21st century of education. In short, innovative work behaviour is the moderator between innovative method in teaching, educational technology tool, learning capabilities, and social integration. These variables affect the teaching performance therefore the present study addresses the following hypotheses:

H5: IWB moderates the relationship between innovative teaching method and the performance of entrepreneurship lecturers.

H6: IWB moderates the relationship between educational technology tools and the performance of entrepreneurship lecturers.

H7: IWB moderates the relationship between learning capability and the performance of entrepreneurship lecturers.

H8: IWB moderates the relationship between social integration and the performance of entrepreneurship lecturers.

2.9 Underpinning Theory

Before embarking the discussion about the relationship between variables, this study will use two underpinning theory and one teaching model which is related to this research. Firstly, A generic teaching model for Entrepreneurship by Fayolle and Gailly 2008), secondly, Rogers (1983), is introduced as diffusion of innovation theory (DoI) stating the different stages of adoption and correspondingly the different types of adopters according to the different characteristics of the technology readiness in educational context. In the current time, the technology plays a crucial role in teaching and learning and thirdly, The Theory of Planned Behavior (TPB) predicts an individual's implementation the intention to engage in a behavior at a specific time and place (Ajzen, 1991).

2.9.1 The Diffusion of Innovation Theory

Theory of diffusion is defined as a process that communicates an innovation among the members of a social system through specific channels. A population can be broken down into five different segments based on their propensity to adopt a specific innovation: diffusion of innovation stated that the adoption process of new innovation usually begins with a small number of innovators (Robinson, 2009; Rogers, 2003). The categories for adopters of innovation are illustrated in Figure 2.1.

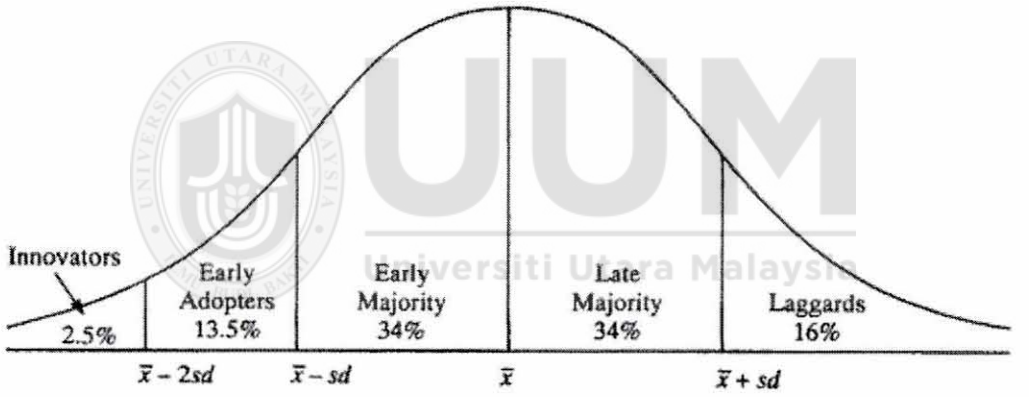

Figure 2.1
Categorization of Adopters (Rogers, 2003)

The process to make the decision to adopt an innovation requires the potential adopter to collect information regarding the technology, examine the technology, and consider whether the technology provides sufficient improvement to deserve the investment of energy and time that are needed for it to be included in individuals range of skills. Therefore, people tend to explore a new technology and experience its effectiveness in their activities before accepting or rejecting it (Rogers, 2003).

The diffusion of innovation theory explains how an innovation, which may be about an idea, behaviour, or object, is adopted among the population. According to Robinson (2009), this theory offers valuable insights into the process of social change as the main qualities that contribute to a successful dissemination of an innovation. Qualities such as peer-to-peer conversations, peer networks, and understanding of the needs of different user segments are highly significant to the theory.

Notably, Rogers (2003), claimed that the dissemination of new innovation can be achieved through five qualities related to innovation from the perspective of the innovators that are listed as follows:

Relative advantage: The strongest predictor of an innovation's rate of adoption is its perceived relative advantage. The realised relative merit of an innovation correlates positively with the innovation's rate of adoption. The former refers to the benefits that a person would consider when they are deciding to adopt the innovation. In this study, the participants emphasised on the advantages of modern educational technologies in innovative integration in teaching. Mainly, these advantages facilitate the educational process in terms of gaining the students' attention, displaying the content in different forms, and saving the time and effort of the lecturers and students.

Compatibility: This refers to the degree to which an innovation is perceived as being consistent with the potential adopters' values, past experiences, and needs (Rogers, 2003). The process of adopting an innovation can be expedited if the individual feels that the new innovation is compatible with their needs and experiences. All participants in this study opined that educational technologies tools in innovation

integration are a powerful tool to help the lecturers save time and effort. They also demonstrated positive values or beliefs towards the implementation of modern educational technologies in the educational process, particularly in the current era of technology. More importantly, they highlighted that educational technologies are one of the tools that shift traditional classes to interactive ones.

Simplicity and ease of use: New ideas that are simpler to understand for the potential adopters are adopted more rapidly than innovations that require the adopters to develop new skills and understandings or innovations with higher complexity. All of the educators interviewed in this study found modern educational technologies in innovation integration to be easy to use. Nonetheless, the lecturers noted that their students occasionally show better proficiency in the usage of modern educational technologies compared to them. The lecturers lacked experience even though modern educational technologies in innovation integration are easy to use. On the contrary, the students which are more familiar with technologies in general can operate them without proper training.

Trialability: This refers to the degree to which an innovation can be experimented with on a limited basis. The lecturers will not force the use of modern educational technologies in innovation integration, in their teaching although they regularly use them in every class. For instance, many lecturers revealed that they used the technologies for approximately 30 minutes out of a 40-minute class. These lecturers had the opportunity to try the modern educational technologies tools and they were free to continue or discontinue their usage.

Observable results: Individuals are more likely to adopt an innovation if they are able to see its results. The lecturers' responses to the interview questions depicted that they had the chance to examine the modern educational technologies in their educational practices and consequently, to benefit from them.

This study concludes that the extent of the innovation method in teaching and lecturers' usage of educational teaching tools in terms of Facebook in innovation integration is related to their perceptions of five major attributes, namely relative advantage, compatibility, simplicity, trialability, and observability. As explained by Rogers' (2003) theory, these attributes have played a crucial role in motivating all of the lecturers to use modern educational technologies tool in their teaching.

Notably, the current study observes a similar gap to a study by Jwaifell & Gasaymeh (2013), to that end, a replication study on bigger scale with larger sample sizes or more participants that embraces other educational institutions and or other disciplines is highly recommended. Furthermore, a quantitative study on extensive samples of students may be conducted to explore the impact of educational technologies' tools and innovation method in innovation integration usage on the lecturers' teaching performance and attitudes.

Therefore, in this study variables that will be applying the theory of DOI are (1) Teaching tool (2) Teaching method (3) Lecturer performance.

2.9.2 Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) predicts an individual's intention to engage in a behavior at a specific time and place. It posits that individual behavior is driven by behavior intentions, where behavior intentions are a function of three determinants: an individual's attitude toward behavior, subjective norms, and perceived behavioral control (Ajzen, 1991).

Behavioral Intention are the proxy measure for behavior. It represents a person's motivation in the sense of her or his conscious plan or decision to perform certain behavior (Lee-Ross,2017 ;Conner & Armitage, 1998). Generally, the strong the intention which are innovative work behaviours, the more likely the behavior will be performed. In this study, the implementation intention to be a entrepreneurship educator's among engineering lecturer in polytechnics are realized.

Attitude toward behavior refers to the degree to which a person has positive or negative feelings of the behavior of interest. It entails a consideration of the outcomes of performing the behavior.

Subjective norm refers to the belief about whether significant others think he or she will perform the behaviour. It relates to a person's perception of the social environment surrounding the behaviour.

Perceived behavioral control refers to the individual's perception of the extent to which performance of the behavior is easy or difficult (Ajzen, 1991). It increases when individuals perceive they have more resources and confidence (Ajzen, 1985; Hartwick

& Barki, 1994; Lee & Kozar, 2005). TPB suggest that PBC plays two roles; one on behavioral intention and the second directly on the actual behaviour (Refer Figure 2.2; page 85). PBC contains two distinct elements including internal and external (Taylor & Todd, 1995). The first element refers to an internal sense of control which is similar to self–efficacy, while the second element is external aspects of control that are required to perform the particular behavior, such as training and technical support (Bandura, 1986). Ajzen (1985) suggests that internal and external aspects of control embodied in PBC are essential to perform most planned behaviors. Ajzen (1985) argues that when behaviors are not entirely under volitional control, PBC directly predicts and explains both behavioral intention and the actual behavior.

Developing a measure utilizing the Theory of Planned Behavior is highly dependent upon in this research being considered as claimed by Ajzen (1985, 1991) that the TPB would explain more variance in behavioral intention and the actual behavior in comparison with the TRA. Measures should assess all main components of the theory: attitude toward behavior, subjective norms, perceived behavioral control, and implement intention. Typical measures follow a Likert-style format and can range in length from a few to the point questions to much longer and more comprehensive surveys.

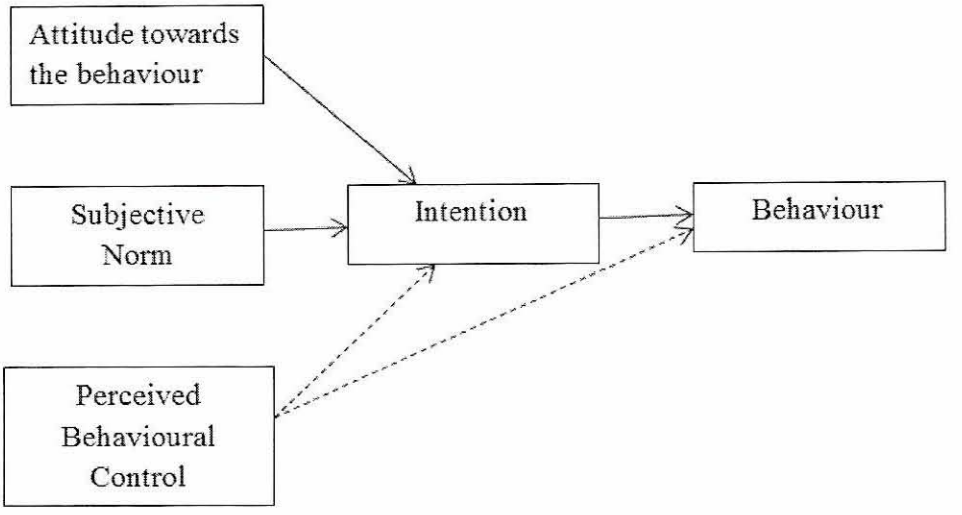

Figure 2.2
Theory Planned Behaviour Adapted from (Ajzen, 1985, 1991).

However, extensive studies have also pointed out teachers' use of technologies are closely linked to their educational beliefs and attitudes toward technology (Sang, et al. 2012; Zhu et al. 2013; Roy, Akhtar& Das, 2017).). This theory has been extensively used as a theoretical basis to explain the implementation behavior of using innovation method in entrepreneurship teaching, using educational technologies tools i.e Facebooks, perform the capability to learning new knowledge and social integration in teaching while teaching entrepreneurship particularly at individual level.

2.10 The Generic Teaching Model for Entrepreneurship

Fayolle and Gailly (2008) developed a generic teaching model for entrepreneurship which is a common and well-known concept in education science (Anderson, 1995; Joyce and Weil, 1996) yet rarely used in entrepreneurship. In this case, there is no common framework reflecting the philosophical and didactical dimensions of entrepreneurship and teaching. The present study first addressed two primary levels of teaching model framework as displayed in Figure 2.3 before developing a deeper insight drawn from the literature review.

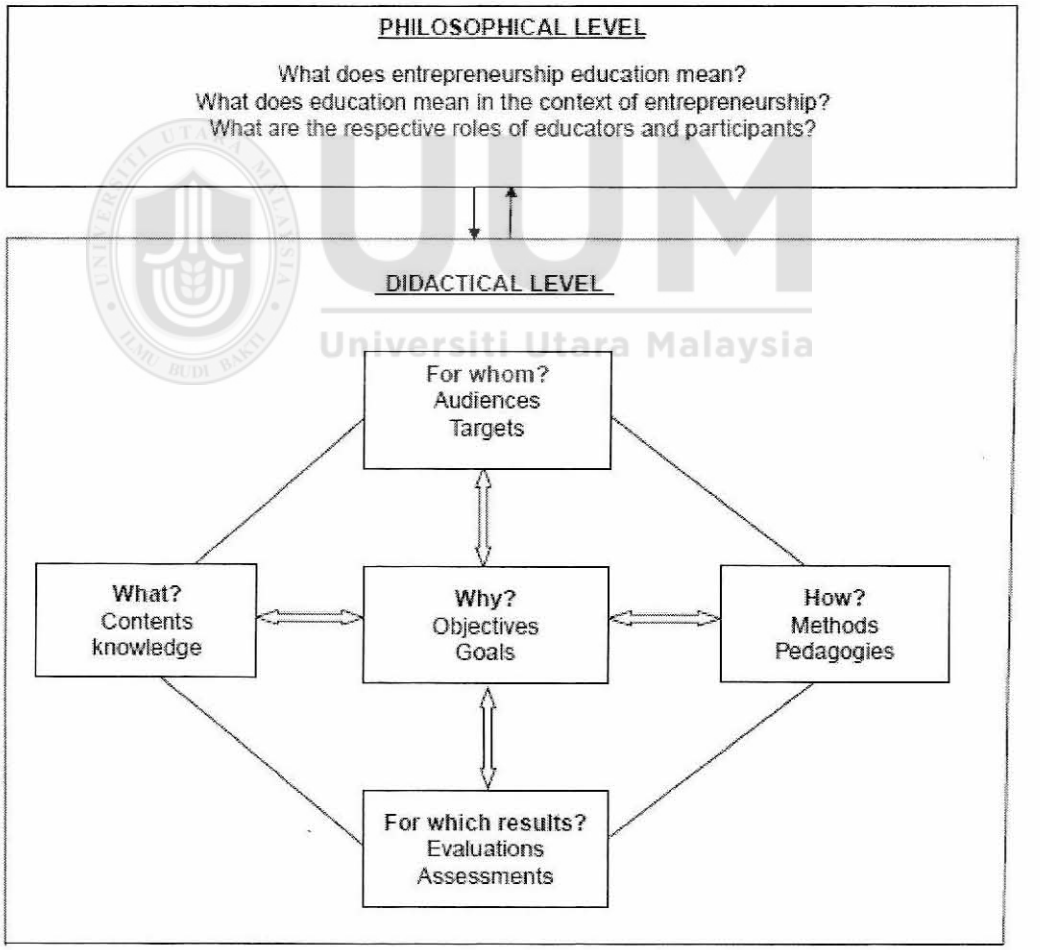

Figure 2.3
A Generic Teaching Model in Entrepreneurship Education.

Philosophical level: it aims at defining a teaching object and the conception of education that determine and guide the role and responsibilities of entrepreneurship educators and participants in a given entrepreneurship intervention. There are lack of research about entrepreneurship educators, as well as their teaching and learning practices. Literature also have not examined the level of knowledge acquisition and expertise among entrepreneurship educators and instructors. Research on entrepreneurship education should address the "behaviourist" and "constructivist" schools of thought and examine the most appropriate setting and condition for entrepreneurial teaching and learning. In this regard, examining how individuals actually learn help educators and instructors to better conceptualize their philosophical roles and responsibilities

Didactical level: it is related to utilising the most appropriate choice for a particular audience and the knowledge possessed by educators about their students/audience/participants in terms of learning objectives, content, pedagogy (teaching methods), and learning outcomes.

Audiences in entrepreneurship programmes: Various audiences are involved in entrepreneurship teaching programmes, particularly the Polytechnics students' as Technical and Vocational Education and Training (TVET) institution, in which students are engaged with a range of engineering disciplines. They are different in terms of socio-demographic, motivation level, and type of aspiration towards entrepreneurship. However, there is a lack of implication of such variety, for example, what is the best combination of learning objectives, content, pedagogy, and learning outcomes in order to cater and accommodate the specific needs for each audience?

Objectives in entrepreneurship programmes: First, there are a number of learning objectives at both pedagogical and socio-economic levels for entrepreneurship programmes, and a few articles have gone beyond rationalising the objectives by explaining the suitable application of learning content and pedagogy to achieve these objectives.

Contents in entrepreneurship programmes: Second, in this sense, pride of place is given to the business planning approach and the functional knowledge supporting the new venture creation process (Honig, 2004). Shane (2003) argued that learning content is commonly designed based on the popular textbooks or references in entrepreneurship and reflect the nature and dynamics of entrepreneurial process. Meanwhile, Edelman, Manolova, and Bruch (2008) highlighted the gap between what educators teach in entrepreneurship and what entrepreneurs actually do in reality. Therefore, entrepreneurial teaching and learning should involve identifying opportunities, assessments and exploitation among educators and students in line with the educational institution's goal of finding opportunities as a job creator.

Methods in entrepreneurship programmes: Third, in terms of the pedagogy (teaching method) of entrepreneurship programme, the literature review have emphasised the importance of learning being active, experiential, learning by doing, and real-world pedagogy to ensure that any entrepreneurship programmes are a good combination of theoretical knowledge and real-world practices. In this study evaluates the effectiveness and efficiency of different teaching methods using the same students' profile and the same research objectives. It also examines the relevance and effectiveness of educational, technology-based instruments like Facebook in order to

integrate valuable and innovative teaching methods in entrepreneurship programmes in Polytechnics.

Evaluation in entrepreneurship programmes: Finally, little research were done in the past on the assessment of entrepreneurship programme. Martin, McNally, and Kay (2013) conducted a meta-analysis in entrepreneurship, suggesting that Entrepreneurship education is positively associated with human capital assets (knowledge, skills, positive perception of entrepreneurship, and intention to become an entrepreneur). Entrepreneurship programme, according to them, must have solid outcomes, particularly for new venture creation for the purpose of measuring entrepreneurial performance.

In this research, researcher used a research design that includes potential moderators of the relationship between entrepreneurship program and innovative work behaviour among entrepreneurship lecturers. Therefore, researcher could discover valuable inspirations, theoretical framework, research method, and concept of the study.

2.11 Summarize of Hypothesis Development

Hypotheses are statements in a quantitative study, in which in this research formulates a prediction or a conjecture about the result of a relationship between the variables or attributes. Creswell (2012), states that hypotheses are traditionally used in experimental research and they serve as research questions that narrow the purpose statement to specific predictions. The hypothesis is a clear statement of what is anticipated to be examined. Usually, hypothesis development is established prior to the conduct of the research that identifies the main concepts involved in the research.

Drawing upon the reviews of literature discussed in the previous chapter and the proposed theoretical framework, hypotheses statements have been formulated based on the relationships between innovative method, educational technology tools, lecturers' learning capabilities, and lecturers' social integration, innovative work behaviour and entrepreneurship lecturer performance.

H1: There will be a positive relationship between innovative method in teaching and the performance of entrepreneurship lecturers.

H2: There will be a positive relationship between educational technology tools and the performance of entrepreneurship lecturers.

H3: There will be a positive relationship between learning capabilities and the performance of entrepreneurship lecturers.

H4: There will be a positive relationship between social integration and the performance of entrepreneurship lecturers.

H5: IWB moderates the relationship between innovative teaching method and the performance of entrepreneurship lecturers.

H6: IWB moderates the relationship between educational technology tools and the performance of entrepreneurship lecturers.

H7: IWB moderates the relationship between learning capabilities and the performance of entrepreneurship lecturers.

H8: IWB moderates the relationship between social integration and the performance of entrepreneurship lecturers.

2.12 Research Framework

There are several important areas where this study makes an original contribution to determine the correlation between two variables whereas namely independent variables (IV) and dependent variables (DV); independents variables in this research are innovative method, educational technological tools, lecturers' learning capabilities, and lecturers' social integration also followed by entrepreneurship lecturer performance as a dependent variables. In this study, it wills expression at moderating effect to analyse the variable in a particular outcome. Innovative work behaviour as a moderator variables are important in scientific analysis. Research framework in figure 2.4 was constructed based on previous literature to determine the relationship and contribution to this study. This framework proposed in this study was developed on the basis of generic teaching model (Fayolle & Gailly, 2008), DoI Theory (Rogers, 2003), and TPB theory (Ajzen, 1991).

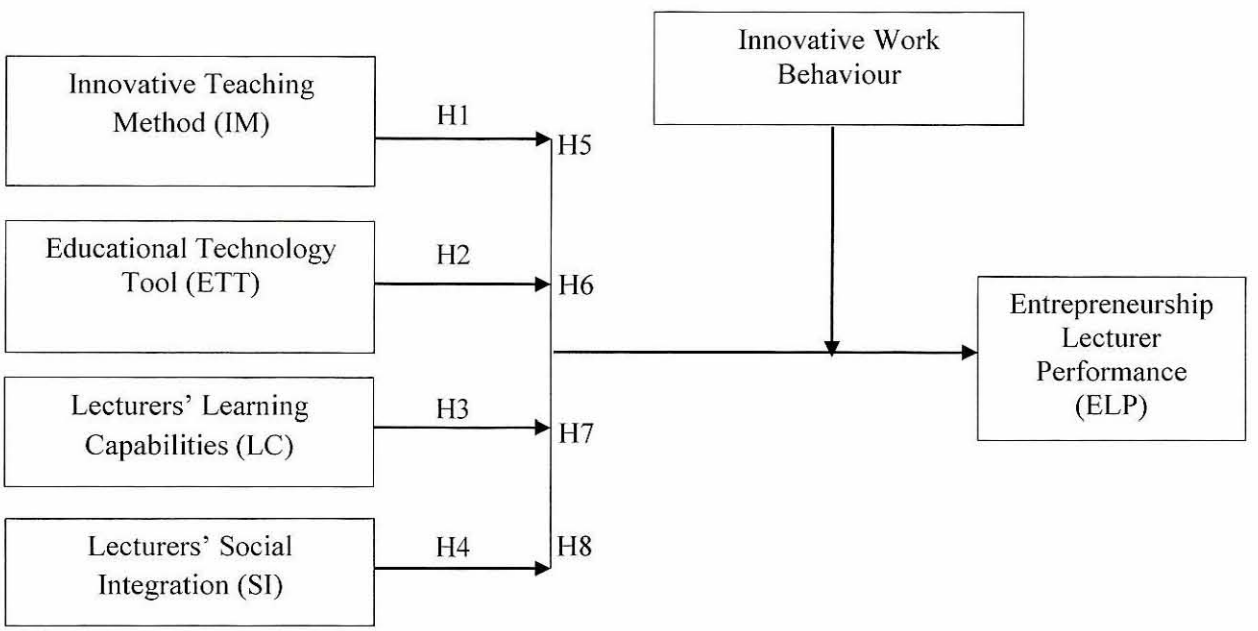

Figure 2.4 *Research Framework*

2.13 Chapter Summary

From the above discussion, in this research summarize that there is a highly positive relationship between the entrepreneurship lecturer performance in term of teaching towards innovative method, educational technology tool, lecturers' learning capabilities and social integration. Nordin Tajul Ariffin (1994) stated that a teacher or lecturer is the heart of the education. From this literature review, it indicated that lecturer contributes significantly towards the entrepreneurship performance.

The generic teaching model in entrepreneurship education was the basic model using in this study, because there is no common framework reflecting the key philosophical and didactical dimensions of entrepreneurship and teaching.

It also has contributed to the theoretical construction of a diffusion of innovation theory approach for students' evaluation of lecturer performance and also using TPB theory as a underpinning theory used to see how far the variables such as social and learning capabilities has positive effects on the effectiveness lecturers performance for entrepreneurship lecturers.

From the literature above, this research will developed the evidence from the literature because of requirement the academic programs in TVET institutions of higher learning (IHL) to have entrepreneurship education in order to produce graduates who have acquired entrepreneurial skills. The Ministry of Education wants all IHL to produce graduates who create jobs rather than those who are just looking for jobs.

According to the definition of innovative work behaviour, individuals engage in innovative activities because of the anticipated benefits from innovative change (Janssen, van de Vliert, &West 2004). Rather, it has focused on treating innovative work behaviour as the moderating variable.

This research has to examine the influence of innovative work behaviour to analysis the relationship between entrepreneurship lecturer performances among the engineering polytechnics lecturers.

It also proves that an empirical investigation on teaching performance is a valuable way to understand the real situation and perspectives about lecturers' performance in term of teaching entrepreneurship task in polytechnic according to students' evaluation.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter explains the methodology adopted in the current study. It is organized according sections: It starts with the presentation of research design in the section one. The chapter continues further with the description of the research design, research methods and unit of analysis. The section two and three of the chapter describe the population, sample, and sampling process and research instruments used in the current study. Subsequently, the section four of the chapter comprises of the discussions about operationalization and measurement of variables. The section five and six discuss the measurement scale and pilot test. Discussion on data collection techniques and procedures is given in the section seven. The sections eight discusses the data analysis techniques and finally the summary of the chapter.

3.2 Research Design

The research design is defined as an attempt to investigate and answer the research questions (Cooper & Scindler, 2001; Bryman & Bell 2015; Kumar, 2005). Three main types of design have been widely used in the academic studies which are; experiments, observation and surveys.

A positivist paradigm, which uses quantitative research, was found to be most appropriate for testing the research assumptions, hypotheses development and solving the research problems. The research focused on testing the theory rather than

developing a theory. Hence, Structural Equation Modelling was used to test the unobserved or latent variables (Hunt, 1991; Hair et al., 1998).

This study focused on the path analysis technique, in which theory can be linked to empirical evidence. There are two basic approaches to doing it; (1) theory testing which used empirical proof to check a theory and (2) theory construction where the empirical evidence is employed to enhance the performance (Mac Nealy, 1999).

3.2.1 Research Methods

The main aim of the current study was to analyse the entrepreneurship lecturer performance and hence, the research design adopted was explanatory which supported the underpinning theories i.e. generic entrepreneurship teaching model, diffusion of innovation and theory of plan behaviour. In addition, this study is correlational in nature where variables that might influence entrepreneurship lecturer's performance were identified. According to Isaac & Micheal (1990), the purpose of the correlation study is to investigate the relationship where variations in one factor correspond with variations in one or more other factors based on the correction coefficient. Further, this study was cross-sectional in nature, in which all study variables were measured at the same point in time.

Moderating variable namely innovative work behaviour is important in scientific analysis where in this research, it was used to moderate the correlation between independents variables namely; innovative teaching method, educational technology tools, lecturers' learning capabilities and lecturers' social integration and dependent variable i.e. entrepreneurship lecturer performance. In other words, this study,

introduced innovative work behaviour as moderating variable on the effect of the variable on a particular outcome. This involves constructing and testing research hypotheses to establish the theory's worth and its ability to make predictions about social phenomena. Explanatory research was used in this research to provide evidence of a relationship or an association of the independent or dependent variables through a survey.

3.2.2 Unit of Analysis

Unit of analysis is the kind of unit utilized by a study when measuring the variables (Neuman, 1997). It is used to explain the subjects being examined within the research. To achieve success, the lecturers should be aware of the most recent changes, be able to assess a scenario, and be excited about the subject. Most of all, the lecturer should have the knowledge to bring theory and practical examples that are connected with the students' real world and knowledge (Van Dam et al., 2010). In this study, the unit analysis was individual students who involved in entrepreneurship program in Malaysian Polytechnics. The data gathered from these unit of analysis was used for statistical analysis and hypothesis testing (Rousseau, 1985).

3.3 Population, Sample and Sampling Process

This section will identify who should complete the survey, how to get the best results from the survey, and what is the most appropriate mode for administering research survey. It is important that the survey be administered in a way that will produce reliable information about what is useful to the target population. According to Salant, et al. (1994), sampling techniques in the field of statistics and survey methodology

refers to the selection of a subset of individuals from a group to represent the characteristics of the population.

In the technology, business and education research, sampling is widely used to collect information about the population. This sampling process consists of several stages, such as defining the population, determines the sampling frame, the set of measurable items, specify the sampling method, determine the size sample, implement the sampling plan and lastly, selecting the sample (Sekaran & Bougie, 2010).

3.3.1 Population

As noted earlier in in chapter 2, the chosen respondents were students. who were involved in entrepreneurship program in Malaysian Polytechnics. According to Halim (2009), to effectively examine lecturers' performance in education and teaching, students should be utilized as the respondents as they are the only people who can effectively evaluate their lecturers. The October 2016 report of polytechnic information was used as it is the most reliable for getting data on various polytechnics, which is widely referred to by researcher who interested to study the Polytechnic sector as TVET. From the October 2016 report of polytechnic information, there were 16,117 number of students from engineering department who were involved in entrepreneurship program in Malaysian Polytechnics and hence the total population.

3.3.2 Sampling Frame

The information acquired from the samples of respondents has to be capable of representing the characteristics of population under study (Latham, 2007; Salant &

Dillmant, 1994). Thus, samples were taken from the sample frame which provides the correct and complete number of elements from where the actual samples were drawn (Cooper & Schindler, 2008).

Tables 3.1:
List of Polytechnics

Polytechnic Category	**Features**	**Polytechnic Name**
Premier	1.Towards a degree awarding institution 2.Partial autonomy 3.Intake requirement equivalent to public universities	1. Politeknik Ungku Omar (PUO) 2. Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA) 3. Politeknik Ibrahim Sultan (PIS)
Conventional	1. Variety of programmes 2. Based on the needs of the region and nation 3. Spread across the nation 4. Minimum academic entry requirements	1. Politeknik Sultan Haji Ahmad Shah (POLISAS) 2. Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS) 3. Politeknik Kota Bharu (PKB) 4. Politeknik Kuching Sarawak (PKS) 5. Politeknik Port Dickson (PPD) 6. Politeknik Kota Kinabalu (PKK) 7. Politeknik Seberang Perai (PSP) 8. Politeknik Melaka (PMK) 9. Politeknik Kuala Terengganu (PKT) 10. Politeknik Sultan Mizan Zainal Abidin (PSMZA) 11. Politeknik Merlimau Melaka (PMM) 12. Politeknik Sultan Azlan Shah (PSAS) 13. Politeknik Tuanku Sultanah Bahiyah (PTSB) 14. Politeknik Sultan Idris Shah (PSIS) 15. Politeknik Tuanku Syed Sirajuddin (PTSS) 16. Politeknik Muadzam Shah (PMS) 17. Politeknik Mukah (PMU) 18. Politeknik Balik Pulau (PBU) 19. Politeknik Jeli Kelantan (PJK)

Table 3.1 (continued)

		20. Politeknik Nilai N. Sembilan (PNS) 21. Politeknik Banting Selangor (PBS) 22. Politeknik Mersing Johor (PMJ) 23. Politeknik Hulu Terengganu (PHT) 24. Politeknik Sandakan Sabah (PSS) 25. Politeknik Tun Syed Nasir (PTSN) 26. Politeknik Besut Terengganu (PBT)
Polytechnic Category	Features	Polytechnic Name
Metro	1. Service programmes 2. Tailored to 3. suit the socio economy of the urban community 4. Blended learning programmes 5. Easy access to public transportation and facilities 6. Minimum academic entry requirements	1. Politeknik METrO Kuala Lumpur (PMKL) 2. Politeknik METrO Kuantan (PMKU) 3. Politeknik METrO Johor Bahru (PMJB) 4. Politeknik METrO Betong Sarawak (PMBS) 5. Politeknik METrO Tasek Gelugor (PMTG)

From the table 3.1, the sampling frame in this research was based on the number of engineering students who took the entrepreneurship module and entrepreneurship digital module as core subjects from three categories of polytechnics, namely, Premier Polytechnics (3), Conventional Polytechnics (26) and Metro Polytechnics (5).

3.3.3 Determination of Sample Size

Determination of sample size is the act of choosing the number of observations in a given population. In empirical studies, the sample size is an important feature when the objective is to make inferences about the general population. The selection of the sample size to be use in the study is necessary before data collection, and the sample

size need to have adequate statistical power (Zikmund 2003; Sekaran 2006). As previously stated, the unit of analysis in this study were individuals, so this research used the Krejcie Morgan (1970) approach to determine the size of the sample. Accordingly, table 3.2 presents the Krejcie and Morgan (1970) sample size determination.

Table 3.2
Sample Size Determination Krejcie and Morgan (1970)

N	S
8000	367
9000	368
10000	370
15000	**375**
20000	377
30000	379
40000	380

Source: (Sekaran, 2006)
Note:
N: Population
S: Sample Size

The common goal of research is to collect data that represent the population. Researchers use the information collected from the survey to the generalize findings from the samples taken. Hence, in determining an appropriate sample size, this research considered the sampling error, the possible non-responses and the possibility of incomplete responses. Using Krejcie and Morgan's (1970) table, the minimum sample size required for this study is 375. This figure represents the sample of student who took entrepreneurship modules or programs in Malaysian Polytechnics.

Apart from the Krejcie & Morgan's (1970) table, there are other guidelines available for determining the required sample size. For instance, according to Cook et al., (1995) and Kline, (1998), the small sample size is less than 100, a modest sample size is between 100 to 200, and the large sample size is more than 200. But in analysis using PLS-SEM, the sample size is very important, as it provides the basis for estimating sampling error. Nevertheless, in PLS-SEM, there are no clear guidelines for adequate sample size, hence it is proposed in the literature that a sample of 200 or more, but not more than 500 is suitable (Bagozzi & Yi, 1988; Baumgartner & Homburg, 1996; Hair et al., 1998). Therefore, the final sample size of 375 respondents was found to be suitable for this study.

Further, Dillman (2011) proposed a formula used to calculate a sample size from a given population:

Equation 3.1

$$Ns = \frac{(Np)(P)(1-P)}{(Np-1)(^{B}/_{C})^{2} + (P)(1-P)}$$

Where:

Ns = Actual sample size
Np = Size of population
P = Population proportion expected to be chosen among the two response categories
B = Sample error
C = Confidence level

According to Krejcie and Morgan (1970), the probability that this procedure produces an interval that contains the true value of the actual parameter known as confidence level and is generally chosen to be 0.9, 0.95 or 0.99. The population proportion assumed to be 0.50 since this would provide the maximum sample size and suggesting that the 5% margin of error must be provided. Gefen and Straub (2005), suggested that this t-value should be equal to or greater than 1.96 to reveal the significance at the alpha level (significance levels) of 0.05.

Therefore, the sample size is important to represent the number of actual population. In this study, the opinion of Krejcie & Morgan (1970), considered to be interpreted based on repeated sampling provided for a 95% confidence interval ideal for most people. Initially, a sample of this size will produce a confidence interval that reflects the true proportion. The confidence level value in turn is derived from the table of the Z critical value that is most commonly used (see table 3.3).

Table 3.3
The confidence level value and Z critical value.

Confidence Level	Z Critical Value (t-value)
80%	1.28
90%	1.645
95%	1.96
98%	2.33
99%	2.58
99.8%	3.09
99.9%	3.29

Therefore, according to the statement above and a formula by (Dillman, 2011), the actual sample size (Ns) is computed as follows:

Np = Size of population (16117)

P = Population proportion expected to be chosen (0.5)

B = sample error at 0.05 (5%)

C = Confidence level at 95% is 1.96

$$Ns = \frac{(16117)(0.5)(1-0.5)}{(16117-1)(^{0.05}/_{1.96})^2 + (0.5)(1-0.5)}$$

$$Ns = \frac{4029.25}{16117\text{x}6.5\text{x}0.0001 - 4 + 0.25}$$

$$Ns = 375$$

The conclusions from both Krejcie and Morgan's (1970) table and the formula by Dillman (2007) sample determination methods, in this research, the obtained sample size was 375 respondents.

3.3.4 The Sampling Technique

The study needed accurate results to draw inferences about the target population. There are various methods for choosing the respondents from a given population. In this study, simple random sampling was used. It was used as it is the simplest technique among all the sampling methods (Kumar, 2005; Sekaran, 2006). It is the simplest and least biased where each element of the population has equal chance of being

recognized and included in the sample. The simple random technique is a suitable method for a population that is not highly differentiated (Zikmund, 2003; Bryman, 2004; Kumar, 2005). Further, simple random sampling is more suitable when the lower response rate is anticipated from large sample size (Visser, 2006). Even though this is the most convenient sampling method, errors such as chance variation and non-perfection in the sample population sometimes arise. Random sampling error is affected by the sample size. A small sample is preferable and the study design should be executed correctly to reduce the non-response error.

As this research aims to study the entrepreneurship lecturer performance among engineering lecturers who have been teaching and are involved in entrepreneurship program and activities, 375 students were randomly selected out of 16117 students across the selected polytechnics. In addition, to reduce the reduce judgment within a purposeful category, the respondents were picked randomly and without regard to the program outcome. However, although the sample size was 375, to avoid low response rate and with the intention of getting higher response rate, this study followed the suggestion of Salkind, (2016) of increasing the sample size by 40-50% and hence distributed 560 questionnaires.

3.3.5 Random Selection of Samples

In the previous discussion, this research applied a random sampling technique, which is commonly used in quantitative research to achieve representativeness of population (Teddlie & Yu, 2007). This was done in the following steps:

Step1: Define the population: 16117 from engineering department of Polytechnics' students.

Step 2: Researcher had a list of sample frame: A list of sample frame for this research was obtained from the report of information polytechnic October 2016 edition.

Step 3: Researcher decide on the sample size to use: The sample size for this research was 375 based on Krejcie and Morgans(1970).

To ease generating random samples, a program called Research Randomiser (Kelley, Clark, Brown, & Sitzia, 2003) was applied to randomly generate 560 samples from 16117 polytechnics students by following these simple steps:

Step 4: Go to Research Randomiser website at www.randomiser.org.

Step 5: Click "Randomise" button in menu bar to display the Randomiser form.

Step 6: In the Randomiser form:

a. Key in "1" for the set of numbers to be generated,

b. Key in "560" for the numbers in set,

c. Key in "1 to 16117" for the range of numbers to be randomised in set,

d. Click "Yes" for generating unique numbers in set,

e. Click "Yes: Least to Greatest" for sorting the numbers in set,

f. Click "Randomise Now!" button to generate the random numbers.

To use these numbers, all targeted respondents in polytechnic involved in the sampling frame were numbered from 1 to 16117 according to their original sequences. The samples were then selected based on the numbers that match the sequences in directory.

3.4 Research Instruments

To ensure the realization of the objective of this study, instrument design is very important. This instrument should be made properly to ensure that the respondents understand and can answer it as accurate as possible. There are different kind of instrument used in social science inquiry such as interview, questionnaire, but considering the objective of the current study, questionnaire was used to collect the data from the students of the polytechnics sampled. According to Sekaran (2006), design of questionnaires is efficient and good when researchers exactly know what is needed and how to measure each variable in their research. Further, a good questionnaire design is important to minimize bias in research, as such, the general rule in researched is that a valid and reliable questionnaire should be used (Creswell, 2012; Leedy & Omrod, 2005), thus, good questionnaire statements should have linkage with the research questions and hypotheses (Ticehurst and Veal, 2000; Kumar, 2005).

In the table 3.4, presented the measures (questionnaire) adapted from previous researches.

Table 3.4
Division of Instruments Study

Section	Instruments	Quantity Item
A	Demographic	11
B	Innovative Method	8
C	Educational Technological Tools	12
D	Learning Capabilities	11
E	Social Integration	11
F	Innovative Work Behaviour	10
G	Entrepreneurship Teaching Performance	11
Total Item		**74**

3.4.1 Instruments Detail

This section details the instrument used by researchers to collect the data. The selection of the instruments was based on their reliability reported by the previous studies. Table 3.5 detailed the instruments and their reliabilities (Cronbach's' alpha values).

Table 3.5
Instruments Details

Variables	**Cronbach's' Alpha Value achieved**	**Sources Adapted**
Innovative Method	0.70	Fatoki, O (2014) Mwasalwiba (2010)
Educational Technological Tools	0.90	Sánchez, Cortijo, & Javed (2014). Mazman, & Usluel(2010)
Learning Capabilities	0.94	C. Zhu et al., 2013
Social Integration	0.80	C. Zhu et al., 2013
Innovative Work Behaviour	0.86	Messmann & Mulder, (2014)
Entrepreneurship Lecturer Performance	0.924 0.86	Lucky & Yusoff (2015). Fatoki & Oni (2014)

3.5 Operationalization and Measurement of Variables

This section provides operational definition of the variables in this study, which consist of 1) Innovative methods, 2) Educational Technology Tools, 3) Lecturers' Learning Capabilities, 4) Lecturers' Social Integration, 5) Innovative Work Behaviour, 6) Entrepreneurship Lecturer Performance. To provide in-depth and help in facilitating the understanding of the variables in this study, these variables were explicitly defined.

3.5.1 Entrepreneurship Lecturer Performance

This study observed that entrepreneurship teaching is saddled on the polytechnics' lecturers. They responsible for teaching entrepreneurship course to engineering department students. Besides engineering subjects, the engineering lectures also need to teach entrepreneurship module or course at diploma and certificate levels during semester three, four, five, and six. Entrepreneurship lecturer must always search for change, responds to it, and exploits it as an opportunity (Drucker, 1985). Therefore, innovation is the tool of entrepreneurship to acquire skills in the use of techniques, in the analysis of business situations, and in the synthesis of action plans; to develop empathy and support for all unique aspects of entrepreneurship; to develop attitudes towards change; and to encourage new start-ups and other entrepreneurial ventures. The term entrepreneurship lecturer performance used in this study refers to affective, cognitive, skill and attitude/behaviour (Fatoki & Oni, 2014). Other lecturer performance factors i.e. effectiveness and overall performance was taken from Lucky & Yusof (2015). Table 3.6, summaries the measurement item for entrepreneurship lecturer performance used in this research.

Table 3.6

Measurement Item for ***Entrepreneurship Lecturer Performance***

No Item	My entrepreneurship lecturer had a competencies to encourage me to...
1	Chosen the right marketing approach for the introduction of a new product development in my project final year.
2	Developed a strategic objective in business plan assignments to enable marketing project
3	Recognized a good business ideas which can be supported to become a business start-up.
4	Analysis a market for a new product or technology while doing my assignments.
5	Developed extensive knowledge in entrepreneurial skills.
	Rate your level of agreement with the following statements:
6	I am satisfied with my lecturers' performance.
7	Overall, my lecturers' teaching delivery is easy and well understood by students
8	My lecturer having a competence in student evaluation, it improve students' confidence in the subject.
9	My lecturers' communication is interesting to students.
10	My lecturer always professional in delivering his/her lectures.
11	I consider entrepreneurship as a desirable career option.

3.5.2 Innovative Methods in Teaching

Mwasaiba, (2010) argued that, if scholars are able to answer the question "Can entrepreneurship be taught?", they still will have to face the next question, "How should it be taught?". According to Arasti et al. (2012), the key to a successful entrepreneurship education is to find the most effective way to manage the teachable skills and identify the best match between student needs and teaching techniques. In this study, using the term innovative methods which are action-based, are those that require the instructor to facilitate learning, to control and apply methods that enable students' self-discovery (Bennett, 2006). The used methods in this study are: (1) lectures, (2) case studies, and (3) group discussions.

This construct consists of two factors related with Diffusion Innovation Theories such as compability and observability (see table 3.7). The construct consists of 8 items which were adapted from Fatoki, (2014) and Mwasalwiba (2010). In addition, all items were measured using 5-point Likert Scale. The selection of the 5-point Likert Scale is in line with the research objectives. In addition, studies using 5-point likert scale reported higher reliabilities. Further, the questionnaires were answered by the student and hence, using this scale will make them stay focused and be honest when answering the questionnaire.

Table 3.7
Measurement Item for ***Innovative Method***

No Item	**My lecturer in entrepreneurship subject used active learning strategies such as:**
1	Lectures
2	Invites guest speakers
3	Case studies
4	Group Discussions
	My lecturer in entrepreneurship subject ...
	Compability
5	Help me to prepare a business plan to understand the entrepreneurial process.
6	Had the abilities to connect the taught subject with student actual life.
	Observability
7	Trained student how to developed skill in using modern multimedia teaching technologies while doing business simulations.
8	Followed my performance during presentations the assignments.

3.5.3 Educational Technology Tools

In this study, Educational Technology Tools refer to Facebook usage as an educational tool. Facebook is being considered as an educational tool because of its beneficial

qualities such as enabling peer feedback, goodness of fit with social context and interaction (Mason, 2006). The construct comprises of three factors according to Diffusion of Innovation i.e. perceived usefulness, perceived ease of use and observable result. The terms were used by previous studies such as Sánchez, Cortijo, and Javed (2014) and Mazman and Usluel (2010). Table 3.8. present the items adapted to measure the construct.

Table 3.8
Measurement Item for ***Educational Technology Tools***

No Item	My lecturer in entrepreneurship subject …
	Perceived Usefulness
1	Allowed me to communicate with more people in a short time period using Facebook.
2	Allowed me to share more entrepreneurial task in a short time period using Facebook.
3	Makes it easier to establish and maintain learning performance using Facebook.
4	Generated new ideas to develop new services marketing using Facebook
	Rate your level of agreement with the following statements:
	Perceived ease of use
5	I became a Facebook member with ease
6	My interaction with my lecturer in Facebook is clear and understandable
7	I don't have any problems learning entrepreneurship using Facebook features on my own.
8	I find it easy to use Facebook features to run entrepreneurship subject assignments
	Observable Result
9	I can learnt more about how to handling business when using Facebook features.
10	I can get technical support by email if I have problems using Facebook.
11	I can connect to Facebook where ever there is Internet connectivity to handle my entrepreneurship simulations learning task.
12	Facebook is similar to other social networks I use (msn, e-mail, online forums).

3.5.4 Learning Capabilities

In this study, the Learning Capabilities referred to entrepreneurship lecturers give emphasis to the impact of active learning, which is consistent with the previous findings that teachers' willingness to learn is a crucial factor for implementing educational innovations (Konings et al. 2007; Zhu et al. 2010). While, MacKinnon (1978) and Chen (2002) proposed that learning capabilities is very important for teaching/task performance. The entrepreneurship lecturers in engineering department in various polytechnics need to have the ability to learn. In Table 3.9, four specific characteristics were identified in relation to learning capability, namely learn actively (the ability to utilize learning resources and opportunities in an active manner); Learn with open mind (be open to accept new concepts, new things, and keep up with the time); Learn from reflection (the ability to reflect their own teaching problems and learn from practices and experiences); Learn with independent thinking (the ability to think independently and do not blindly believe in authorities and books).

Table 3.9
Measurement Item for ***Learning Capabilities***

No Item	My lecturer in entrepreneurship subject …
1	Actively learn new things related to new teaching methods from another sources.
2	Relates the teaching to the professional environment.
3	Learned as much as can in his/her field.
4	Know how to learn to improve his/her teaching.
5	Learn from a variety of means.
6	Be able to learn proactively.
7	Capable learning independently.
8	Always keep up to date knowledge in entrepreneurial field.
9	Created new ways of doing things.
10	Applied skill and knowledge of using ICT to actual practice.
11	Involved any activities related entrepreneurship education

3.5.5 Social Integration

The term social integration indicates that entrepreneurship lecturers of engineering department in polytechnics have the ability to communicate with students with different backgrounds and cooperate with other colleagues. These abilities are given emphasis to building positive human relationships and getting support from others for teaching (Pantic & Wubbels 2010).

Hence, in Table 3.10 below, five characteristic were identified in this study, namely communicative (the ability to exchange opinions and suggestions with others effectively and build good interaction with students with good communication skills), cooperative (the ability to cooperate with others and participate in teamwork); courageous (have the courage to try new things on teaching and the ability to work under pressure); persistent (the ability to persist in certain interests and engage in certain teaching activities for a long term); democratic (the ability to respect students' ideas, understand them from their views, and give students opportunities to express themselves). Based on this, the table 3.10 presents the items to measure the construct.

Table 3.10
Measurement Item for ***Social Integration***

No Item	My lecturer in entrepreneurship subject …
1	Shared teaching problems with others to motivated students take interest in their learning process.
2	Always gives students the freedom to express creativity in carrying out the assignment.
3	Have the knowledge on how to cooperate with others.
4	Always tells students about the expected competency to be gained in the subject.
5	Always allows and encourages the participation of students in every teaching and learning activity.

Table 3.10 (continued)

6	Capable of maintaining a dynamic interaction with student.
7	Be able to guided students who are weak in class.
8	Always help students think critically during lessons.
9	Convincing students that they can do the exercises or assignments well.
10	Help students learn effectively.
11	Submit meaningful questions to students during lessons.

3.5.6 Innovative Work Behaviour

In this study, Innovative work behaviour was defined as an individual's behaviour that aims at achieving the initiation and intentional introduction of new and useful ideas, working methods, technique and instruments into entrepreneurship teaching role. It is the sum of physical and cognitive work activities carried out by employees in their work context, either solitarily or in a social setting, in order to accomplish a set of tasks that are required to achieve the goal of innovation development (Kanter, 1988; Messmann & Mulder, 2011).). Innovative work behaviour requires a specification of the work activities that have to be carried out to accomplish each of the described innovation tasks; Opportunity exploration, Idea generation, Idea promotion and Idea realization as summaries in Table 3.11.

Table 3.11
Measurement Item for ***Innovative Work Behaviour***

No Item	**My entrepreneurship lecturer had a competencies to encouraged me to...**
1	Pay attention to issues that are not part of teaching work
2	Wonder how things can be improved if integrated modern multimedia technology into the teaching practice.
3	Always search out new working methods, techniques or instruments
4	Generate original solutions for problems arise
5	Finding new approaches to execute teaching tasks
6	Always make important organizational members enthusiastic for innovative ideas
7	Always attempt to convince people to support an innovative idea

Table 3.11 (continued)

8	Had introduce innovative ideas into teaching practices
9	Contributed to the implementation of new ideas
10	Put effort in the development of new product design or services

3.6 Measurement Scale

Scale design is very important in research design because it determines the level of ability of the respondent to answer survey questions effectively. Research projects of this type usually use measurement on the Likert scaling system (Zikmund, 2003; Kumar, 2005). Hence It is important to explain the use of Likert Scales in this study which was to show attitude or opinion of the respondents to assess the level of agreement or disagreement (Kumar, 2005; Veal, 2005). It is a closed-end questions where the respondents select the appropriate answers from specific answers or multiple choices (Zikmund, 2003).

Many studies in the social sciences use Likert scale to in their study. In this scaling system, categories are used; three-point, five-point, seven-point, or ten-point numerical range, depending on how accurately researchers need to rate the intensity of respondents' attitudes (Cohen & Cohen, 1983; Kumar, 2005). A range of more than a three-point scale is more accurate (Cohen & Cohen, 1983). The using of a five-point scale limits the response choice, but a seven-point scale reduces inaccuracy (Burns & Bush, 2000). This statement was also supported by Vavra (1997), who pointed out that the highest is the ten-point scale which allows more discrimination than a seven-point scale, but it is complicated for the respondents to answer.

Compared to all the categories of Likert scales, according to Babakus & Mangold (1992), the five-point scale is the most appropriate one to measure the response rate and response quality along with reducing respondents' "frustration level". Gonzalez, (2014), said that, in the study of performance, technology and innovation, it is typical to use a 5-points Likert scale. This statement was support by Marton-Williams (1986), who argued that in any type of study, the researchers can use a 5-point Likert scale or any other Likert scale (7 or 9 Likert scale).

However, (Jenkins & Taber, 1977; Lissitz & Green, 1975; McKelvie, 1978; Remmers & Ewart, 1941), mentioned that the use of a 5-point Likert scale is seen easier for researchers when analysing the data. Further, it makes respondents to stay focused on the questionnaire and answered more honestly. This opinion is supported by Gonzalez, (2014), who states that it is difficult to determine the respondent views when using a Likert scale greater than seven. This means that if the research offers more than 7 response options, respondents may choose their answers at random and with it, the data will no longer be important. Hence, this study uses the five-point Likert scale.

3.7 Pilot Test

Pilot study is very important because it can improve the questionnaires (Neuman, 1997). Cooper & Schindler (2001) also mentioned that to detect the weaknesses in design and instrumentation pilot study is necessary. Therefore, performing pilot study for the instrument before the actual data collection has many advantages to the success of study, as this will provide the opportunity to remove ambiguity and increase clarity of some items in the questionnaire (Sekaran & Bougie, 2010; Zikmund et al., 2012).

Hence, sample of the respondents should be used to test the adopted instruments (Dillman et al., 2014). Accordingly, in this research, 35 questionnaires were distributed to the prospective respondents who were selected randomly from the sample frame. Mostly, those respondents selected were from Mechanical Engineering Department, Polytechnic Sultan Abdul Halim Mu'adzam Shah. Out of the 35 questionnaires distributed, 30 were used, while five were not valid and thus, not considered for analysis. In addition, 30 samples were the minimum acceptable sample size for pilot study (Sekaran, 2003).

3.7.1 Validity Test

In this research, there were two types of validity assessed. The first one was internal validity, the issue of the authenticity of the cause-and-effect relationship; and the second one was external validity, the generalise ability to the external environment (Zikmund, 2003; Sekaran, 2006).

Internal validity measures the relationship between variables that are real, whereas external validity determines the extent to which inferences in the research can be made about the external environment. Validity is examining the instrument to ensure that a set of questions are asked with the hope of tapping the concept, does indeed measure the concept that has been set out to do and not different constructs (Siniscalco & Auriat, 2005; Sekaran, 2006). Validity, relates to whether the findings represent an actual picture of the situation. In a simple word, does the items measures what it should measure.

Since the questions are taken from previous studies, content validity is also important because it refers to the suitability of the questions on measuring the concept. It ensures that measures are adequate and represent the concept to be tested (Babbie, 1990). This is where the panel of experts contributes. In this study, the validity of the questionnaire instruments was tested by a committee of four experts; one Professor at the University Utara Malaysia (Expert 1), The head of entrepreneurship unit of Polytechnic Sultan Abdul Halim Mu'adzam Shah (Expert 2), one senior lecturer in the Electrical engineering department of Polytechnic Sultan Abdul Halim Mu'adzam Shah (Expert 3) and one senior English lecturer from Polytechnic Sultan Abdul Halim Mu'adzam Shah (Expert 4). Accordingly, some concerns were expressed by these experts on wording of the questions such as the needs to change or modify to make them easier to understand.

In the discussion with the expert, researcher took note that the term "social networks" in the item "Facebook is similar to other social networks I use" in the context of Educational technology needed to be explained further or adding some simplifications to make the respondents understand. So, in this research, "(msn, e-mail, online forums)" were added at the end of item. Overall, the experts were satisfied with the questionnaire and approved it to be used for data collection in the current study.

In addition, face validity indicates that on the surface, the questions look like they measure the concept (Sekaran, 2005). Hence, in this study, face validity is tested using five students from Mechanical Engineering Department, Polytechnic Sultan Abdul Halim Mu'adzam Shah.

3.7.2 Reliability Test

Another important test that is very crucial in pilot survey are internal consistency and reliability of the items which are examined using Cronbach's Alpha. According to Zikmund (2003), the reliability is being free from error and obtaining the consistent result. The reliability of a measure indicates the extent to which it is without bias (error free) and thus, ensures consistent measuring overtime. According to Sekaran (2006), reliability indicates the stability and consistency of the instrument to measures the construct which helps to assess the goodness of the measure.

Cronbach's Alpha is a reliability coefficient that reflects how well items are correlated to one another. The determination of instrument reliability according to Uma Sekaran (2003), is the higher value of Cronbach-alpha of the instrument in question. The measure of reliability of an instrument is based on the following interpretation; perfect (Cronbach's alpha=1), good (Cronbach's alpha=0.8 to 0.99), acceptable (Cronbach's alpha 0.6 to 0.79) and weak (Cronbach alpha=less than 0.6).

In this study, researcher calculated the value of Cronbach Alpha using IBM-SPSS version 22. The justification why it was calculated is because it has implications to the findings of the research as such, the findings are reliable if the same result is obtained when study is repeated. According to Onwuegbuzie & Daniel (2002), the reliability of instruments should be a common method to estimate the internal consistency of items.

Table 3. 12
Summary of Reliability Pilot Test

Variables	Reliability
Entrepreneurship Lecturer Performance	.759
Innovative Method	.860
Educational Technological Tools	.865
Learning Capabilities	.875
Social Integration	.887
Innovative Work Behaviour	.899

Table 3.12 shows the summary of the reliability results. From the table, the instrument yielded satisfactory internal consistency for six constructs consisting of Entrepreneurship Lecturer Performance, Innovative Method, Educational Technological Tools, Learning Capabilities, Social Integration and Innovative Work Behaviour. It could be seen from the table that the Cronbach's coefficient alpha values for those constructs were well above 0.75. Accordingly, given the Cronbach's Alpha coefficient values of those constructs, they are above with established benchmark of 0.75 meaning that all of them are reliable and thus, there was no need for further action. Hence, this study has shown that all the items are reliable for use as the real instruments to measure the constructs under study.

3.8 Data Collection

The current study, used the set of printed questionnaires and created Google Forms to collect and organise information. The reason for using Google Form was because it has relatively low cost and the facts of respondent are anonymous in entire countries. This leads more open and truthful responses.

Prior to data collection, the researcher obtained a letter of permission from OYA, UUM and Polytechnics' headquarters (Department Polytechnics Education) to conduct the research. Approximately, 560 sets of questionnaires were prepared for distribution. The respondents were given ample time about 20 minutes to answer the questionnaires.

3.8.1 Data Collection Method

Following pilot testing, the researcher launches the actual data collection, which takes a period of 4 month (from May to August 2017) by distributed mailing (Form) and (E-form).

The survey was conducted through the set of printed questionnaires (Form) using a mailing procedure as recommended by Salant and Dillmant (1994) and created Google Forms (E-Form) to collect and organise large information on the large amount sampling.The reason using Google Form because of its relatively low cost and anonymous data from respondent in entire countries lead to more openness and truthful responses.

According to Liu and Fellow (2008), questionnaires are effective tools for reaching a wide audience. In this study, the researcher distributed questionnaires consisted 74 items to the polytechnics students from 33 polytechnics that were involve in entrepreneurship program who were under lecturer (academic advisory) supervision to collect data in program under Polytechnics' Department of Education, namely one lecturer 5 graduates (1L5G). The questionnaires were prepared in English because it

serves as the generally acceptable channel of communication in Polytechnic as a TVET educational institutions.

3.8.2 Data Collection Procedure

Hence, the procedure for collecting data was implemented when the researcher obtained a permission letter from OYA UUM and Polytechnics' headquarters (Polytechnics Education Department) to conduct the research. Approximately 560 sets of questionnaires were prepared for distribution. A better response rate for mail survey can be achieved if respondents are notified in advance on the forthcoming survey (Sekaran, 2003). As such, the respondents were notified in advance and they were also given ample time about 20 minutes to answer the questionnaires.

To achieve the target, six-steps procedure of encouraging participation (Dhanani, O' Shaughnessy, & Louw, 1997) was followed:

1. Each respondents' representative was informed using telephoned and emailed about the survey and upcoming questionnaire. (The researcher is also a senior lecturer at polytechnic, it was therefore easier to handle the bureaucratic procedure).

2. The questionnaire was sent using registered postal service to the named representative respondents, namely head of engineering department rather than the department name to reduce possibility of bureaucracy in mail handling

3. The stamped return envelope of "Pos Ekspres" with address was included for ease of returning the questionnaire.

4. Each question was written short and concise for better interpretation.

5. The respondents were assured for the privacy of their data.

6. The respondents were offered a copy of results upon request.

Regarding Step 5 above, the confidentiality of data provided by respondents was made clear in this study cover letter (see Appendix A) and data collection letter from the OYA Graduate School of Business, Universiti Utara Malaysia (UUM) (see Appendix B). This was crucial in increasing the response rate as respondents were more willing to respond to a survey that came from a university (Edwards, *et. al.*, 2002). Besides that, a support letter from the Department of Polytechnics' Headquarters (see Appendix C) was also attached to encourage greater response.

3.9 Data Analysis Technique

There are two generations of analytical techniques employed to forecast and predict the dependent variable. Earlier generation regression models such as LOGIT, MANOVA ANOVA, and linear regression, enable researchers to perform analyses for only one layer of linkages between research variables at a time. By contrast, second generation of data analysis techniques, such as Structural Equation Modelling (SEM), enable high quality statistical analysis. It allows researchers to answer interrelated research questions in a single and comprehensive analysis by modelling the

relationships among research constructs simultaneously (Bagozzi & Yi, 2012; Gefen, 2000; Kline, 2010).

Unlike early generation regression modelling, SEM evaluates both the assumed causation among a set of research constructs and the loadings of observed items (measurements) on their expected latent variables (constructs), in one analysis. In other words, SEM tests both, factor analysis and hypotheses, in a single analysis (Bagozzi & Yi, 2012; Gefen, 2000; Kline, 2010). By doing so, a proposed research model will be tested more rigorously by using better methodological assessment tools. SEM also delivers information about the extent to which the research model is supported by the collected data (Bagozzi & Yi, 2012; Gefen, Rigdon, & Straub, 2011a). In order to obtain reliable findings, this study will choice to SEM techniques of analysis for predicting the dependent variable.

In many respects, however, the model evaluation in SEM is heavily influenced by different approaches of SEM specifically in terms of the evaluation of measurement model. In general, there are two approaches to estimate the parameters of SEM, namely, the Covariance-Based SEM (CB-SEM) approach and the Variance-based SEM (VB-SEM, also called PLS-SEM) approach. Those approaches are very different in their model development procedure, estimation objectives, underlining philosophy, distributional assumptions, theoretical background, estimation and interpretation (cf. Hair et al. 2010). Thus, both approaches have different features that make them appropriate for different research purposes.

SEM has taken up a prominent role within the academic literature of many fields, specifically in performance research, to test whether or not theoretical assumptions are supported with empirical data. Although, choosing the correct approach has triggered significant debate across a variety of disciplines in recent decades (Diamantopoulos, Riefler, & Roth, 2008; Goodhue, Lewis, & Thompson, 2012; Sarstedt, Ringle, & Hair, 2014a), however, several considerations are important when deciding which approach should be applied. The choice of whether CB-SEM or PLS-SEM depends on research settings and objectives. Hair et al. (2011), recommended rules of thumb in selecting the correct approach for analysis. There are rules of thumb that should be applied at the time of deciding whether to use PLS-SEM or CB-SEM in accordance with Hair et al. (2014). In view of this, five types of decision considerations are listed in the table comprising research goals, measurement model specification, structural model complexity, and data characteristics.

The choice of SEM approach is determined by the research objective. CB-SEM is more appropriate statistical methodology when the underlining research model is grounded on strong theory and further confirmation and testing are the goals (Davcik, 2014; Hair et al., 2014a; Hair et al., 2011a; Henseler et al., 2009). In contrast, in a situation where theory is not well developed, the path relationships between the latent constructs are the primary concern in model testing, and researchers are generally less concerned with predictive accuracy of the model, PLS-SEM approach is the methodological choice (Davcik, 2014; Hair et al., 2014a; Hair et al., 2011a; Henseler et al., 2009). PLS-SEM is more oriented towards predicting path relationships between the latent construct rather than the predictive accuracy of the model. It is the most preferred

approach when the research objective is theory development and prediction (Davcik, 2014; Hair et al., 2014a; Hair et al., 2011a; Henseler et al., 2009). Nevertheless, Hair et al. (2011b) confirm that PLS-SEM's capabilities also support its usage for theory testing (conformation).

3.9.1 Descriptive Data Analysis

Descriptive analysis is important in the analysis process which involves converting of raw data into forms that is easily understood and interpret. It calculates averages, means, standard deviations, frequency distributions, percentage distributions and finally summarizing the data. In this research, descriptive analysis was done to analyse the respondents' demographic characteristics such as gender, age, university, major, grade position, teaching entrepreneurship program, parents, family, courses, and courses name. Therefore, in this research IBM SPSS Statistics was employed as the tools to perform descriptive analysis.

The analysis data involves three steps which are organizing the data, summarizing the data and interpreting the data (Salleh, 2006). Data are divided into parametric and non-parametric. Verma (2012) point out the use of SPSS functions, such as comprehensive system in analysing data as the software can take data to generate charts, tabularized reports, plot distribution and trends, descriptive statistics and complex statistical analysis.

3.9.2 Reliability

Cronbach's alpha is one of the most popular tests for indicators reliability. It postulates that all indicators are equally reliable and each indicator should be typically more than 0.7 (Davcik, 2014; Diamantopoulos et al., 2008; Hair et al., 2010; Hair et al., 2014a; Hair et al., 2011a; Henseler et al., 2009; Jarvis et al., 2003). On the other hand, internal consistency reliability examines the extent to which construct indicators are inter-correlated assuming that all indicators are not equally reliable. Internal consistency reliability is usually represented by composite reliability and it can be interpreted in the same way as Cronbach's alpha (Hair et al., 2014a; Hair et al., 2011a; Sarstedt et al., 2014b).

3.9.3 Normality Test

The next step after viewing the data for nonresponse bias and response rate was to prepare the data, which is crucial before any analysis is performed (Tabachnick & Fidell, 2007). One of the multivariate assumptions is testing for normality, (Hinkle, Wiersma, & Jurs, 2003).

Assessment for normality of data distribution was performed so the appropriate methods that required certain statistical procedure for analysis can be applied (Blaikie, 2003). Hence, by inspecting the normality of data, the types of test performed such as parametric or nonparametric was decided (Chan, 2003; Conover & Iman, 1981). As such, the interpretation and inferences of the results would be more reliable and/or valid (Razali & Wah, 2011). Normal distribution that is known for its normal curve or bell-shaped curve (Frankfort-Nachmias & Leon-Guerrero, 2009) has many scores in

the middle of the scale with fewer scores progressively going out to both extremes (Hinkle, Wiersma, & Jurs, 2003). Normality can be identified either with a graphical methods, numerical methods, and formal normality tests (Razali & Wah, 2011). Since some of the methods are quite sensitive to the sample size, it was advised to use more than one method to "assess the actual degree of departure from normality" (Hair, Anderson, Tatham, & Black, 1992). For these reasons, two methods were applied in this study. Since the criteria for removing outliers were based on the assumed normal distribution (Hodge & Austin, 2004; Grubbs, 1969), the normality of data distribution in this study is only assessed after removal of the 1 cases.

3.9.4 Multicollinearity

Multicollinearity is an issue essential to be examined prior to the assessment of structural model. Thus, Multicollinearity assessment is presented in the chapter four.

3.9.5 Structural Equation Modelling

Through PLS-SEM, the study demonstrated graphically and holistically the model consisting of predictors of the entrepreneurship lecturer performance. Based on the model, this study explained the influence and direction of the relationship between the variables simultaneously. Besides that, PLS-SEM also determined the dominant variable components in determining the achievement of entrepreneurship lecturer performance among engineering lecturers in Malaysian polytechnics.

3.9.5.1 Composite Reliability

In PLS-SEM, assessing construct reliability is based on composite reliability which acts as an approximation to construct internal consistency. Unlike Cronbach's alpha, composite reliability does not assume that all indicators have the same reliability. In order to evaluate the construct reliability, PLS-SEM also takes into account the aspect of stability and similarity of constructs (Hair, Ringle & Sarstedt, 2011). The coefficient value of the accepted composite reliability is greater than 0.70 (Hair et al., 2012). Additionally, each indicator reliability should also be taken into account with the standardized loading value exceeding 0.70 (Hair et al., 2010). In PLS-SEM, the weighting factor for each item must exceed 0.5 5 (> 0.5) so that it can show a strong correlation to its own constructs compared to the other constructs (Hair, Ringle, & Sarstedt, 2011).

3.9.5.2 Average Variance Extracted

Construct validity refers to the level at which a measurement represents with accuracy what should be measured (constructs). Constructs that attain acceptable level of validity prove that the items obtained from the study sample really reflect the conditions that exist in the population. Construct validity tests consist of convergent validity and discriminant validity (Hair et al., 2010).

Convergent validity focuses on the extent to which items for a construct generally contribute to the variance of the constructs (Hair et al., 2010). It is measured using the Fornell and Larcker (1981) methods. Hair, Ringle and Sarstedt (2011) clarified that there are three tests used to evaluate the convergence validity ie; the standardized

imposed value should exceed 0.50, the Extracted Average Variance - for each construct should exceeds or is equal to 0.5 (≥ 0.50) and the composite reliability value (CR) should exceeds 0.70. High AVE values prove that latent variables can account for most of the overall variance.

3.9.5.3 Discriminant Validity

Discriminant validity determines the extent to which an item is unique and completely different from other items (Schumaker & Lomax, 2010) or a construct is completely different from other constructs (Hair et al., 2010). Thus, an item or construct does not overlap with other items or constructs. The assessment of discriminant validity is based on the average variance of the extracted (AVE). The high value of the AVE indicates that the indicator (item) really measures the tested constructs and differs with other items from other constructs (Byrne, 2010; Hair et al., 2010). The accepted AVE value is ≥ 0.5 (Hair et al., 2010; Hair, Ringle & Sarstedt, 2011).

In the analysis using PLS-SEM, discriminant validity is determined based on the comparison between the AVE square root values and the correlation value (r) between two tested constructs (Hair, Ringle & Sarstedt, 2011). In this analysis the value of the square root of the AVE must be greater than the value of r ($\sqrt{AVE} > r$). Further, the weighting factor for each construct must also exceed the cross-factor weightings (Hair, Ringle & Sarstedt, 2011).

3.9.5.4 Structural Model Assessment

In the PLS-SEM structural model evaluation, focus is given to the variance of R^2 value change and the significant degree of path coefficients. Variance of R^2 value changes at the level of 0.75, 0.50 or 0.25 in structural models can be described as strong, moderate or weak (Hair, Ringle & Sarstedt, 2011). This change in R^2 value should be high enough to explain the variance of the endogenous latent variable well. Further, the structural model is being used to explain the correlation between the constructs of the study through the standard regression coefficient (β).

1) Direct effect testing

Involves measuring the relationship of the between independent variables namely social integration, learning capability, innovation teaching and method educational technological tools and the dependent variable, the entrepreneurship lecturer performance. To access the direct relationship, PLS-SEM technique was applied. Specifically, bootstrapping was executed to get the significance level between variables through statistical t-value and p-values (Hair, Ringle & Sarstedt, 2011). Based on the conceptual model of the study, this direct effect test explained the hypothesis 1 to hypothesis 4 as described in chapter 2 and 3.

2) Moderating effect testing

A moderating variable analysis is carried out in this study to test the interaction effect inherent on the relationship between exogenous and endogenous variables. There are several methods that are often used to test interaction relationships. Among them are causal step strategy (Baron & Kenny, 1986), the Sobel test or also known as product-

of-coefficients approach (Sobel, 1982), distribution approach (MacKinnon, Coxe, & Baraldi, 2012) and bootstrapping (Preacher & Hayes, 2004, 2008; Fairchild & McQuillin, 2010).

In this study, bootstrapping method was used as it is the most accurate compared to the other approaches. Preacher and Hayes (2008) recommends the bootstrapping method based on two main reasons. First, bootstrapping is a parametric approach that allows estimation of the size effects to be made without having to satisfy the normative assumption of sampling and variable distributions. Secondly, bootstrapping is a suitable method to be used for studies with small sample size.

Therefore, this study, innovative work behaviour was introduced as the moderating variable. Therefore, based on the study's conceptual model, the study test four moderating hypotheses (Hypothesis 5 to Hypothesis 8).

Finally, and based on the explanation above, the researcher summarized the assessment of both measurement as well as structural model in Table 3.13.

Table 3.13
Summary the Level of Measurement in Research Model

Measurement Model

Details	Analysis	Level accepted	Source
Reliability of Items/Indicator	Factor Loading	> 0.50 for satisfying item satisfaction.	Hair et al. (2010)
Internal consistency	Composite Reliability (CR)	> 0.70 for internal level acceptance received.	(Gefen, 2000)
Convergent Validity	Average Variance of The Extract (AVE)	> 0.50 for the level of validity is concentrated.	(Henseler, Ringle, & Sinkovics, 2009))
Discriminant Validity	Fornell-Larcker Criterion	√AVE every variable must exceed the inter correlation with other variables in order to ensure the validity of the discriminant.	Fornell & Larcker (1981)
	Cross load	The load of external indicators, each item is higher than the load indicators other items.	Chin (1998); Gotz, Liehr-Gobbers & Kraft (2010)

Table 3.13 (continued)

Structural Model

Details	Analysis	Level accepted	Source
Collinearity	Varian Inflation Factor (VIF)	< 5.00 indicate no collinearity problem.	Hair et al. (2014)
Path coefficients	T value	>1.65* shows the coefficient is significant at 5% >2.33* shows the coefficient is significant 1%	Hair et al., (2014)
Significant level	P value	< 0.05 for the significant level received. Less than 0.01** for the significant level of acceptance.	Hair et al., (2014)
Predictive relevance Test	Q-square	> 0.00 as indicative of structural model has Predictive relevance. The predicted effect is 0.02 = small, 0.15 = medium and 0.35 = large	Hair et al., (2014); Henseler et al.,(2009)
Size Effect	F^2	Based on three indications of 0.02 = small, 0.15 = medium and 0.35 = large.	Cohen (1988)

3.10 Summary

This chapter provided the detailed explanation of research approach. Item measurements for all the variables, questionnaire development, survey administration, data collection and method of data analysis. It explained the items reliability and validity which was determined through Cronbach's' Alpha. The method of this study is quantitative and the data were collected and analyse based on the questionnaire distributed. Questionnaires were used due to large number of respondents (polytechnics' diploma engineering students who were involve in entrepreneurship program). Further, the chapter explained the research design adopted i.e. empirical and hypotheses testing. The direct effect of innovative method, educational technology tools, learning capabilities and social integration on the entrepreneurship lecturer performance was also explained. In addition, the moderating effect (indirect effects) of innovation work behaviour on the relationship of teaching using educational technology tools, lecturers' learning capabilities, lecturers' social integration and lecturer teaching performance in Malaysia Polytechnics was also highlighted. Finally, this chapter discussed the statistical package (IBM SPSS Statistics) and structural equation modelling (SEM-PLS) as the main tools of analysis in this study.

CHAPTER FOUR
RESULT AND FINDINGS

4.1 Introduction

This chapter explained the analysis, result as well as findings of the study. It explained the use of SPSS and PLS-SEM software as the tools of analysis. Data clean-up using the SPSS was done before the regression analysis. It also shows the analysis which specifically addressed eight hypotheses as discussed in chapter one using the PLS-SEM. The chapter highlighted the application of PLS-SEM for hypothesis testing which requires initial preparing of a diagram that displays the relationships between research variables and demonstrates the research hypotheses that will be examined.

4.2 Response Rate

A total of 560 questionnaires were sent to and retrieved from the respondent within the period of four months (May - August, 2017), thus, the process ran for four months. Four months were the normal period for a one-time data collection method. Hence, the total number of responses and response rate was summarised in Table 4.1.

Table 4.1
Response Statistics

Procedure	Sample Size	Response	Frequency / Rate
Form	410	Distributed questionnaires	560
e-Form	150		
Form	307	Returned questionnaires	450
e-Form	143		
Form	257	Usable questionnaires	375
e-Form	118		

Table 4.1 (continued)

All	450	• Unusable questionnaires • Outliers	75
All		Response rate	71.43%
All		Usable response rate	83.33%

4.2.1 Non Response Bias

Non-response bias is another important methodological issue in survey research and can compromise the study results. It typically focuses on comparing responses of late-stage with responses of early-stage (Armstrong & Overton, 1977). In general, delayed responses are interpreted as a lack of interest or commitment particularly on the part of respondents and thus, differences in responses can be due to substantial delay in responding to a survey (Armstrong & Overton, 1977).

Discussing the non-response bias is very necessary because very few studies can get 100% response rates. This problem will occur in the study and researchers need to know why it happens and understand specifically why the survey they did not reach the 100% response rates. Non-response bias is when the respondents did not fill and return the questionnaire within than the time that is given. If the percentage of non-response bias is high, it will affect the results of the study.

According to Macmillan & Schumacher (2006), the rate of returned questionnaire must be less than 70%. If the respondent answered late, it has the same characteristics as non-respondent. It is necessary to compare the characteristics of the respondent who responded early or late. If there are no difference between the two groups' response, then there is no non-response bias in the research.

To evaluate whether there is response bias, this research followed the method suggested by Armstrong and Overton, (1977). That is, comparing the early and late responses using form and e-Form. In view of this, the Levene's Test for Equality of Variances was conducted to compare the responses from the two types of data collection method; as mentioned in previous section about data collection method using E-form (google form) and Form(mailing).

The outcome in Table 4.2 demonstrated no systematic non-response bias and, in turn, concluded that the samples obtained from research population are able to represent the total population of the study (Armstrong & Overton, 1977).

Table 4.2
Non Response Bias rate

Variables	**Group**	**n**	**Mean**	***Levene's Test for Equality of Variances***	
				F	**Sig.**
Entrepreneurship Lecturer	Form	257	3.97	1.997	0.158*
Performance	e-Form	118	3.96		
Innovative Method	Form	257	3.98	2.098	0.148*
	e-Form	118	3.96		
Educational Technology Tools	Form	257	3.98	3.306	0.070*
	e-Form	118	3.91		
Learnings Capabilities	Form	257	4.01	1.054	0.305*
	e-Form	118	4.00		
Social Integration	Form	257	3.97	0.167	0.683*
	e-Form	118	4.02		
Innovative Work Behaviour	Form	257	3.95	0.211	0.646*
	e-Form	118	3.91		

N = Number of questionnaires
Significant level = P>0.05*

4.3 Data Screening and Preliminary Analysis

Early screening data is very important in multivariate analysis as it helps researchers identify any key assumptions about using multivariate analysis data techniques (Hair et al., 2007). In addition, preliminary data checks can also help researchers to better understand the data collected for further analysis.

Prior to the data filter, all 450 returns and can be used for questionnaires were encoded and included in the SPSS software. After data encoding and entry, the following initial data analysis has been implemented: (1) Missing value analysis, (2) outliers, (3) Normality test, and (4) Multicollinearity test (Hair, Anderson, Tatham, & Black, 1998; Tabachnick & Fidell, 2007).

4.3.1 Missing Values Analysis

Missing data, however, is another important issue in survey process that could cause serious problems during data analysis (Hair et al., 2010; Hair, Hult, Ringle, & Sarstedt, 2014a; Zikmund et al., 2012) particularly in PLS-SEM.

It occurs when information is not provided for particular questions in the survey. Missing data could be as a result of several reasons, such as, human mistakes during data entry, misunderstanding of the questions by respondents, and/or the respondents are either not willing to answer the question or did not know the right answer (Hair et al., 2010).

To identify and handle the missing data correctly, Hair et al. (2010) recommends three ways to evaluate the extent to which there are missing data. Firstly, missing data can

be classified as ignored, if a respondent did not provide answers for equal or less than 10% of all the questions that are included in the survey, and thus it can be replaced by mean or median. Secondly, if a respondent fail to provide more than 50%, the respondents' responses will be part of those of candidates for deletion. Thirdly, if the respondent is unable to answer 20-30%, this can be remedied by replacing the missing value by the mean or median.

Following those guidelines, it appears no one item suffered from extensive missing data. Table 4.3 showed the analysis of missing data using SPSS. Consequently, without the missing values available, via the form, there were 257 valid responses, while via the E-Form, there were 118. These were used for the further analysis.

Table 4.3
Missing Value analysis

	Respondent		Missing Value	
Variable	**N**	**Percent**	**N**	**Percent**
Entrepreneurship Lecturer Performance	375	100.0%	0	0.0%
Innovation Method	375	100.0%	0	0.0%
Educational Technology Tools	375	100.0%	0	0.0%
Learning Capability	375	100.0%	0	0.0%
Social Integrations	375	100.0%	0	0.0%
Innovation Work Behaviour	375	100.0%	0	0.0%

4.3.2 Assessment of Outliers

An outlier is an observation with unique characteristics that is distant from other values in a random sample of population (Hair et al., 2010). It can be an extreme value to a particular question, or extreme values to all questions. In general, statistical inferential tests can be relatively sensitive to outliers, often because, the calculations rely on

squared deviations from the mean (Hair et al., 2010). Although, PLS-SEM is not affected by outliers (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014; Hair, Ringle, & Sarstedt, 2011a; Henseler, Ringle, & Sinkovics, 2009; Henseler & Sarstedt, 2013), several researchers do recommend the examination and elimination of observed outliers before starting the hypotheses testing (Hair et al., 2014a).

Boxplot was used to detect outliers by inspecting of data distribution. In the boxplot, "The rectangle represents 50 per cent of the cases, with the whiskers (the lines protruding from the box) going out to the smallest and largest value" and the median value line was located in the middle of the rectangle (Pallant, 2007). With these guidelines, the boxplots of all variables were visually inspected (see figure 4.1.).

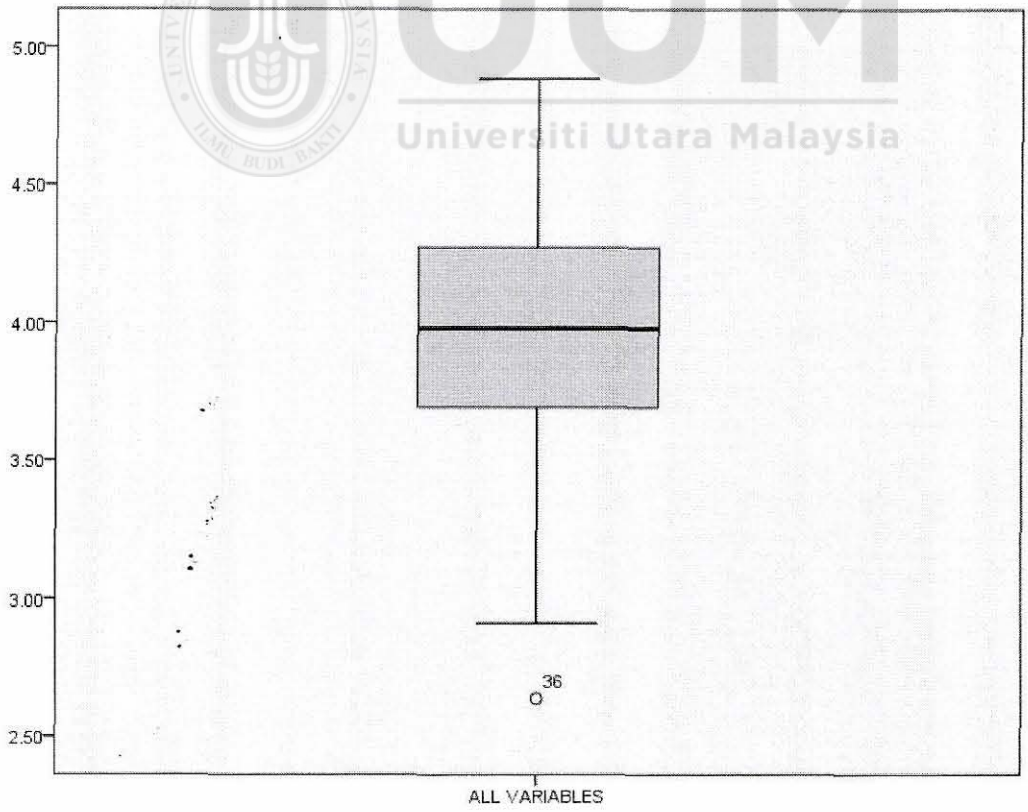

Figure 4.1
Detection of Outliers

Throughout the inspection, it was observed that only a one outliers (respondents number 36) had appeared outside the boxes and there were no extreme values (marked with *) at all, while 50% of the cases were inside the rectangle and the median value line was in the middle of the rectangle of all boxplots. Therefore, the data distribution of all variables was suggested to be approximately normal and free from outliers.

Practically, researchers usually identify outlier observations by examining the extent to which a particular response is departed from the normal distribution of the sample (Hair et al., 2010). In this process, researchers most often convert the data values into standard scores which have mean and standard deviation of zero and one accordingly. According to the rule of thumb, the threshold value of standard scores is up to 4 (Hair et al., 2010). Once the outlier values are identified, the researcher must decide whether to retain or delete them.

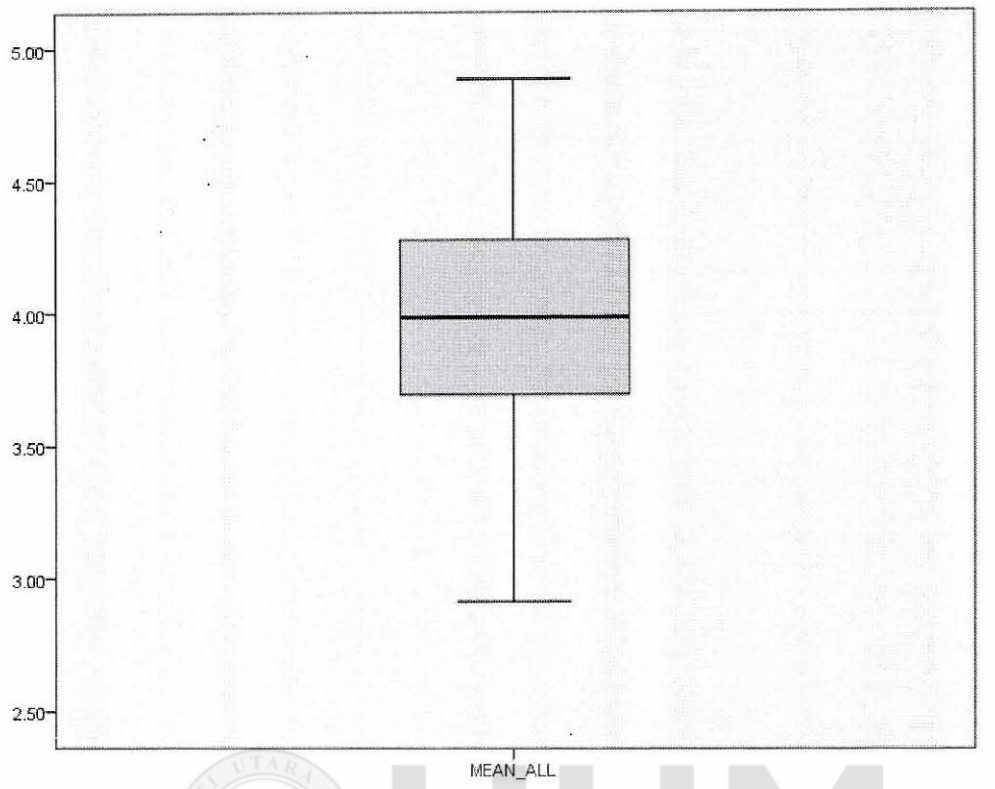

Figure 4.2
Data Outliers Replaced With Mean Value

This study used boxplots which is graphically depicting the degree to which scores values of particulate item is far from its mean. Boxplots usually recommend some observations that could be outliers. More precisely, through boxplot in Figure 4.1, the result from one observations indicates that the were one detected outlier (respondent number 36), therefore, because the outlier are very small, mean value replacement instead of case wise deletion was used in treating such case as recommended in PLS (Hair et al., 2014a). Thus, this study performs mean replacement for those values particularly in Figure 4.2. Accordingly, outliers are not issue for concern in this research.

4.3.3 Normality Test

Normality test help to check if the data score is normally distributed. Normally test forms part of the data screening before actual analysis can be used (Pallant, 2007).Normality can be identified either with a graphical methods or/and numerical methods (Razali & Wah, 2011).In view of the normality test, in this study, used two methods in testing the normality in order to know the actual level the data deviate from normal distribution (Hair et al,. 1992). These methods were discussed in the next section.

4.3.3.1 Graphical Methods

One of the methods to evaluate the normality is through histogram residual plots. It refers to the shape of data distribution for each constructs and its connection to normal distribution. To achieve normality, the distribution of the plot is required to be normally distributed. Therefore, this study used a graphical technique to check for the normality of the data collected (Tabachnick & Fidell, 2007). Using SPSS, as seen in Figure 4.3, the normal histogram showed that the normality was attained because all the bars on the histogram were almost within a normal curve. Thus, the data distribution for all the constructs is considered to be appropriately normal.

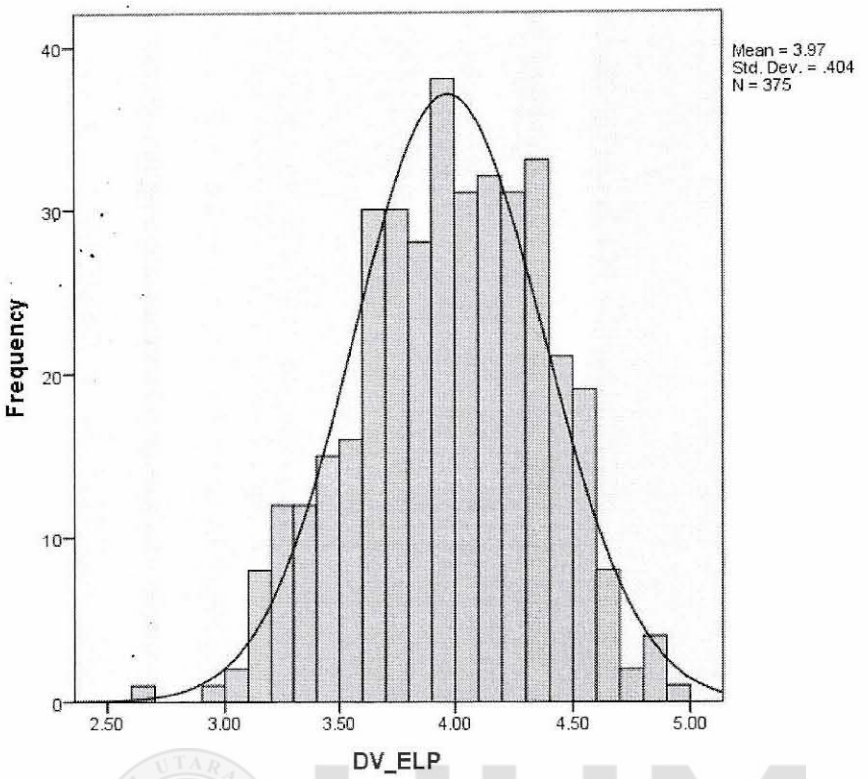

Figure 4.3
Histogram and normal probability plots for all variables.

In addition, to the above normality test methods, data normality can also be seen using the normal probability plot (P-P plot) method as suggested by Hair et al. (2014). According to Hair et al. (2014), in the usual P-P plot, the compiled data must be plotted compared to the selected value. A straight line from left to right is a normal line. Therefore, as shown in figure 4.4., the data were fairly concentrated along the straight line. This indicates the normality of the data in this study.

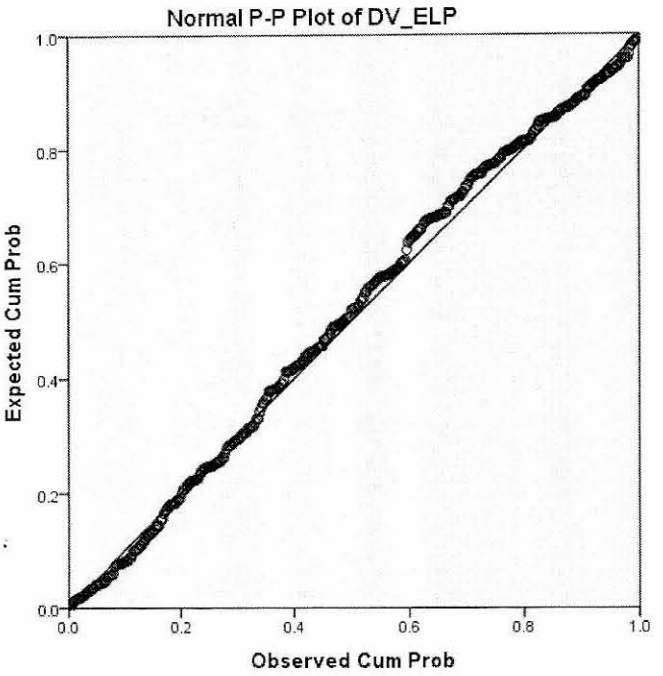

Figure 4.4
Normal P-P plot of Regression Standardized Residual

4.3.3.2 Numerical Methods: Skewness and Kurtosis Test

Skewness refers to the symmetrical data distribution, while Kurtosis refers to the peakedness of data distribution, in which both are compared to normal distribution (Hair, Anderson, Tatham, & Black, 1995). As Skewness and Kurtosis tests are descriptive statistics (Razali & Wah, 2011), they can be interpreted as follows: data distribution is perfectly normal if the values of Skewness and Kurtosis is zero. Positive skew is where the right tail is too long with many cases piling up to the left. Negative skew is just the opposite of the positive skew (Tabachnick & Fidell, 2007). Meanwhile, positive Kurtosis refers to data distribution that is peaked. In contrast, negative Kurtosis refers to data distribution that is flat (Pallant, 2007). With these guidelines, the summary of Skewness and Kurtosis were analysed as in Table 4.4.

Table 4.4
Skewness and Kurtosis Test

Types	Variables	Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
Dependent Variables	Entrepreneurship lecturer performance	-.438	.126	.335	.251
Independent Variables	Innovation method	-.266	.126	-.202	.251
	Educational technology tools	-.278	.126	.108	.251
	Learning Capabilities	-.199	.126	-.308	.251
	Social Integration	-.369	.126	.070	.251
Moderating Variables	Innovation Work Behaviour	-.443	.126	.730	.251

As the table shows, all variables standard error for skewness were .126 values, and kurtosis were .251. Descriptively, it appears that while the skewness of all variables were negative, in kurtosis, four variables (entrepreneurship lecturer performance, educational technology tools, social integration and innovation work behaviour) had peaked data distribution and the other two variables (innovation method and learning capabilities) had flat data distribution.

The data distribution could be regarded as positive if the data distribution is peaked, while negative kurtosis is when the data distribution is flat. But, data distribution is completely normal if the values of skewness and kurtosis are zero (Razali & Wah, 2011). Since the same result was also observed for kurtosis, it had been proven that the data distribution of all variables is approximately normal.

4.3.4 Multicollinearity Test

Practically, Variance Inflation Factor (VIF) is a frequently used method of inspecting Multicollinearity (Petter, Straub, & Rai, 2007). According to Hair et al. (2006), the common cut off for a tolerance value is 0.10, which corresponds to the VIF value less than 10 (Hair et al, 2010). Using PLS algorithm, the VIF values for all constructs were generated. The data in the table in Table 4.5 presented the tolerance and VIF values for the independents variables.

The results in Table 4.5 indicate that multicollinearity does not exist among all independent variables because the tolerance values were more than 0.10 and the VIF values were less than 10. The values vary between 1.011 and 4.028 which less than the cut-off value of 10. Therefore, it can be concluded that the proposed path model in both samples has no Multicollinearity issue.

Table 4.5
Collinearity Statistic for Tolerance and VIF

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Innovation Method	0.248	4.028
Educational Technology Tools	0.253	3.953
Learning Capabilities	0.855	1.169
Social Integration	0.779	1.283
Innovation Work Behaviour	0.999	1.001

4.4 Demographic Profile of the Respondent

After data screening, one outlier was identified and cleaned it, still leaving the final data set of 375 respondents (n=375). This section discusses about sample characteristics. A total of 375 Malaysian polytechnics students were involved in the analysis and their demographic characteristics were discussed.

4.4.1 Year of Respondent's Study

The analysis in table 4.6 shows that year of study respondents who answered the questionnaire 82 (21.9%) were students of 1st year. But, only 2 (0.5%) of the 2nd year students were involved in this study as the respondents, while the highest number of respondents 291 (77.6%) were 3rd year students.

Table 4.6
Year of Respondent's Study

Year	Frequency	Percent	Valid Percent
1st year	82	21.9	21.9
2nd year	2	0.5	0.5
3rd year	291	77.6	77.6
Total	375	100.0	100.0

4.4.2 Gender

Overall, the analysis showed that male participants outnumbered their female's counterpart. Table 4.7 reveals that majority of the respondents were males, 249 (66.4%), compared to 126 (33.6%) females.

Table 4.7
Gender respondents'

Gender	Frequency	Percent	Valid Percent
Male	249	66.4	66.4
Female	126	33.6	33.6
Total	375	100.0	100.0

4.4.3 Age

Table 4.8 illustrates the frequencies and percentages for the respondents' age. 20 years old students have the highest frequency of 273 (72.8%), while the 82 (21.9%) were 18 years of age. The table also showed 7 respondents, representing 1.9% were at the age of 23 and above. Further, 21 and 22 years old shared the same frequency of 5 respondents (1.3%) while 3 respondents representing 0.8%. were 19 years of age.

Table 4.8
Age

Ages	Frequency	Percent	Valid Percent
18 years	82	21.9	21.9
19 Years	3	0.8	.8
20 Years	273	72.8	72.8
21 Years	5	1.3	1.3
22 Years	5	1.3	1.3
Above 23 years	7	1.9	1.9
Total	375	100.0	100.0

4.4.4 Race

It is apparent from Table 4.9 that, while ethnic Malays represents the majority of the respondents in this study 348 (92.8%), followed by Chinese 13 (3.5%) then Indians representing 11 (2.9%) respectively, very few of other races were involved as respondents, particularly only 3 (0.8%).

Table 4.9
Race

Race	Frequency	Percent	Valid Percent
Malay	348	92.8	92.8
Chinese	13	3.5	3.5
Indian	11	2.9	2.9
Others	3	.8	.8
Total	375	100.0	100.0

4.4.5 Department

Table 4.10 showed the departments of the respondents. It is clear that 107(28.5%) respondents representing the highest number of respondents from single department were from JTMK, while the second highest was from JKM which was 88 (23.5%) followed by JKA 73 (19.5%). While other departments such as marine represent 55 (14.7%) and lastly the respondents from the JKE department were 52 (13.9%).

Table 4.10
Department

Department	Frequency	Percent	Valid Percent
JKA	73	19.5	19.5
JKE	52	13.9	13.9
JKM	88	23.5	23.5
JTMK	107	28.5	28.5
OTHERS	55	14.7	14.7
Total	375	100.0	100.0

4.4.6 Family Business and Intent to Business

From table 4.11, it is interesting to note that 231 representing 61.6% of the respondents were from entrepreneurial parents (their parent operate business), while 144 representing 38.4% of the respondents' parents were not into any form of business activity

Although the respondents have engineering background, having entrepreneurial parents may have impact on improving the performance of entrepreneurship lecturers in cultivating entrepreneurial value, interest and encouragement to students to venture into entrepreneurship. Compared to 38.4% respondents who are lacking basic knowledge about the business because they are not exposed to business activities from their homes, result from table 4.11 shows that 61.6% of students have been exposed to business from the beginning of their life through family and this has indirectly been nurturing their existing knowledge about the business world.

It can be seen from table 4.11 that the involvement of students in entrepreneurial programs being held by polytechnics is very encouraging, 335 respondents represents 89.3% are actively participating in entrepreneurship programs in or outside polytechnics. This has encouraged them to participate in the survey. Further, the performance of entrepreneurship lecturers is very good in raising the interest of students to venture into entrepreneurship through program and activities organized by the institutions.

Additionally, table 4.11 showed that 87.7% of respondents had their own business. The initiative of the Companies Commission of Malaysia (SSM) which provides free registration fee to IPTA students including Polytechnic, has injected the spirit of the students into starting their own company even though they are from engineering background.

The able also showed that there are 6 (2.4%) of the respondents who intend to do business next year (e.g. after graduation), followed by 9 (2.4%) who intend to do

business in the next 5 years. Meanwhile, the number of respondents who intend to open their own business in the next 10 years is 12 respondents representing (3.2%). However, a total of 19 respondents (5.1%) were found to have no interest and no desire to open any business in the future. This is because they do not have any interest or the ability to open their business and hence prefer to be employed.

Table 4.11
Family in business and intent to business

Demographic Variables	**Category**	**Frequency**	**Percentage (%)**
Parents Involved Business	Yes	231	61.6
	No	144	38.4
Entrepreneurship Program involving	None	19	5.1
	1	12	3.2
	2	9	2.4
	3 or more	335	89.3

Demographic Variables	Category	Frequency	Percentage (%)
Own Business	Yes	329	87.7
	No	46	12.3
Intention Business next year	Yes	6	2.4
	No	369	97.6
Intention Business next 5 year	Yes	9	2.4
	No	366	97.6
Intention Business next 10 year	Yes	12	3.2

Demographic Variables	Category	Frequency	Percentage (%)
Intention Business next 10 year	No	363	96.8
Don't have any Intention in Business	Yes	19	5.1
	No	356	94.9

4.5 Descriptive Analysis of the Latent Constructs

A descriptive analysis of the variables under investigation was conducted to enrich the knowledge of the characteristics of these variables. Sekaran and Bougie (2010) argued that descriptive analysis will facilitate in making simple decisions for many situations in a quantitative manner. For the purpose of this study, descriptive analysis was undertaken to examine the level of these variables, which comprise of entrepreneurship lecturer performance, innovation method, educational technology tools, lecturers learning capability, social integration and innovation work behaviour.

The descriptive statistics in Table 4.12 depicts the sample value (n), mean values, and standard deviation of all the variables in the questionnaires. Since this study employs a five-point Likert scale, the range is between 1 (the lowest) and 5 (the highest). For the purpose of classifying the perception level of these variables, a computation was made on the mean using the middle point to differentiate the low, moderate, and high level (Healey, 2005). Hence, the mean scores are categorized into three levels namely; low (mean=1.00 to 2.00), moderate (mean = 3.01 to 4.00) and high (mean = 4.01 to 5.00).

Based on the results in table 4.12, it is seen that the mean values range between 3.699 and 4.0022. In general, it can be summarized that each variable either dependent, independent, or moderator has a high level of mean score.

Table 4.12
Descriptive statistic for all variables

ITEM	n	Mean	Std. Deviation
Entrepreneurship Lecturer Performance	375	3.699	0.68810
Innovation Method	375	3.9752	0.67758
Educational Technology Tools	375	3.9582	0.64469
Lecturers Learning Capability	375	4.0022	0.65853
Social Integration	375	3.9859	0.67732
Innovation Work Behaviour.	375	3.9355	0.67380

Specifically, the mean for entrepreneurship lecturer performance factors is 3.699 with standard deviation of 0.68810. The mean for innovation method is 3.9752 with standard deviation of 0.67758; the mean for educational technology tools is 3.9582 with standard deviation of 0.64469; lecturers learning capability is 4.0022 with standard deviation of 0.65853; social integration is 3.9859 with standard deviation of 0.67732 and innovation work behaviour is 3.9355 with standard deviation of 0.67380. In general, the results show that the means for all variables are greater than 3.00.

4.6 Assessment of Measurement Model

Before testing the study's hypotheses, the measurement model (outer model), was assessed through the partial least squares structural equation modelling (PLS-SEM) technique. To achieve reliability, 8 items were forced to be removed from the 63 items contained in this study. The remaining 55 items illustrate good reliability as such used for further analysis. Table 4.13 shows the summary of changes in the number of items that occur after deletion.

Table 4.13
Summary items used

Variables	Old Items	New Items
Entrepreneurship Lecturer Performance	11	11
Innovative Method	8	4
Educational Technology Tools	12	8
Lecturers' Learning Capabilities	11	11
Lecturers' Social Integration	11	11
Innovative Work Behavior	10	10
Total Items	**63**	**55**

Note: Dependent Variable = Entrepreneurship Lecturer Performance. Moderating Variable = IWB

To assess measurement model, this study followed the two steps approach suggested by Anderson and Gerbing (1988). Figure 4.5 shows the measurement model of this study. The next section discussed the individual item reliability, internal consistency reliability, convergent validity and discriminant validity.

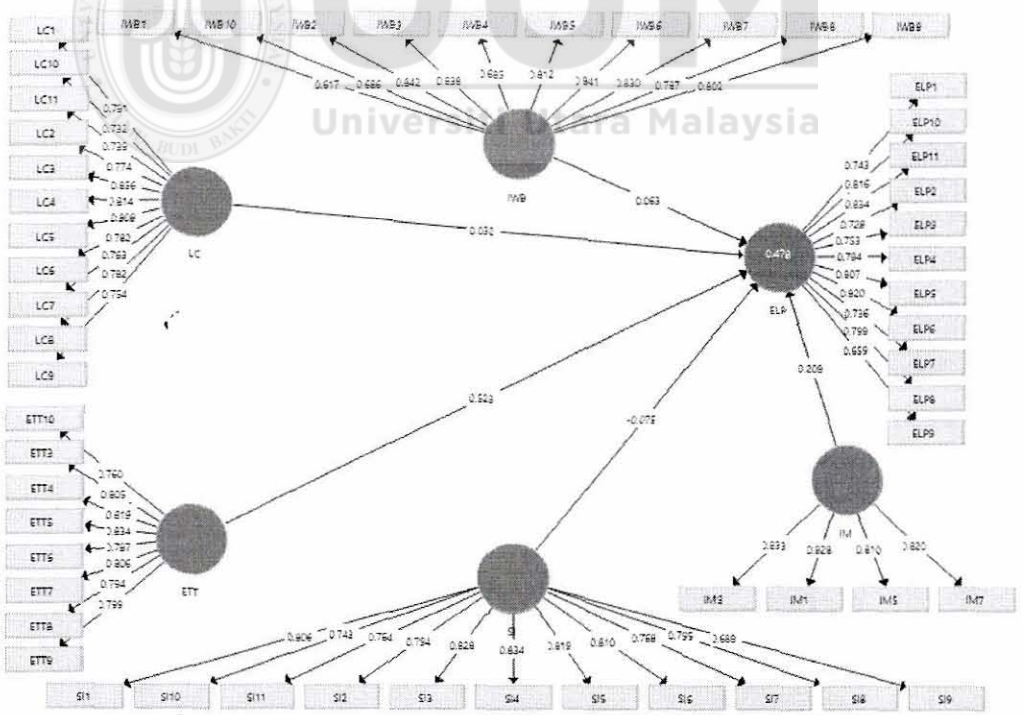

Figure 4.5
The Model Smart PLS-SEM for Measurement Model

4.6.1 *Individual Item* Reliability

Individual item reliability was assessed by examining the outer loadings of each construct's measure (Duarte & Raposo, 2010; Hair et al., 2014; Hair et al., 2012; Hulland, 1999). Following the rule of thumb for retaining items with loadings exceeding 0.50 for satisfying item satisfaction (Hair et al., 2010), it was discovered that out of eight items were deleted because they presented loadings below the threshold of 0.40. Thus, in the whole model, only 55 items were retained as they had loadings between 0.842. and 0.617. (see Table 4.13)

4.6.2 Internal Consistency Reliability

Internal consistency reliability refers to the extent to which all items on a particular (sub) scale are measuring the same concept (Bijttebier et al., 2000; Sun et al., 2007). Cronbach's alpha coefficient and composite reliability coefficient are the most commonly used estimators of the internal consistency reliability of an instrument in organizational research (Bacon, Sauer, & Young, 1995; McCrae, Kurtz, Yamagata, & Terracciano, 2011; Peterson & Kim, 2013). In this study, composite reliability coefficient was chosen to ascertain the internal consistency reliability of measures adapted.

Two main reasons justified the use of composite reliability coefficient. Firstly, composite reliability coefficient provides a much less biased estimate of reliability than Cronbach's alpha coefficient because the later assumes all items contribute equally to its construct without considering the actual contribution of individual

loadings (Barclay, Higgins, & Thompson, 1995; Gotz, Liehr-Gobbers, & Krafft, 2010).

4.6.3 Convergent Validity

The convergent validity is the degree to which a group of variables converge in measuring a specific concept (Hair et al., 2010). As suggested by Hair et al. (2010), to establish the convergent validity, three criteria should be tested simultaneously, namely the factor loadings, composite reliability (CR), and average variance extracted (AVE). further, the composite reliability coefficient estimates of latent variable should be above 0.50 (Hair et al, 2006; Byrne, 2010).

In the first criteria, table 4.14 indicates that all the factor's loadings were significant at the 0.01 level of significance. The second criterion to test convergent validity is the composite reliability which refers the degree to which a set of items consistently measure the latent construct (Hair et al., 2010). In Table 4.14, the values of Cronbach's Alpha and composite reliability were examined. The values of Cronbach Alpha ranged from 0.893 to 0.945 and the composite reliability ranged from 0.893 to 0.945 which exceeds the recommended level of 0.7 (Fornell &Larcker, 1981; Hair et al., 2010). Therefore, these results confirm the convergent validity of the outer model. Furthermore, the values of the average variance extracted (AVE) were examined to confirm the convergent validity of the outer model. AVE reflects the average of variance extracted among a group of items in relation to the variance shared with the errors of measurement. In other words, AVE measures the variance captured by indicators in relation to the variance assignable to the measurement errors. Hence, if

the value of AVE is at least 0.5, these set of items have an adequate convergence in measuring the concerned construct (Barclay et al., 1995). In this study, AVE values range between 0.6 and 0.677 that indicate a good level of construct validity of the measures used.

Table 4.14
Summary of Assesment Constructs

Items	Construct	Loadings	Cronbach' alpha	Composite Reliability	Average Variance Extracted (AVE)
	Entrepreneurship Lecturer Performance				
ELP1	Chosen the right marketing approach for the introduction of a new product development in my project final year.	0.743			
ELP10	My lecturer always professional in delivering his/her lectures.	0.816			
ELP11	I consider entrepreneurship as a desirable career option.	0.834			
ELP2	Developed a strategic objective in business plan assignments to enable marketing project	0.728			
ELP3	Recognized a good business ideas which can be supported to become a business start-up.	0.753			
ELP4	Analysis a market for a new product or technology while doing my assignments.	0.794	0.94	0.94	0.598
ELP5	Developed extensive knowledge in entrepreneurial skills.	0.807			
ELP6	I am satisfied with my lecturers' performance.	0.820			
ELP7	Overall, my lecturers' teaching delivery is easy and well understood by students	0.736			
ELP8	My lecturer having a competence in student evaluation, it improve students' confidence in the subject.	0.799			
ELP9	My lecturers' communication is interesting to students.	0.659			

Cont. Table 4.14
Summary of Assesment Constructs

Items	Construct	Loadings	Cronbach' alpha	Composite Reliability	Average Variance Extracted (AVE)
	Educational Technology Tools				
ETT10	I can get technical support by email if I have problems using Facebook.	0.760			
ETT3	Makes it easier to establish and maintain learning performance using Facebook.	0.805			
ETT4	Generated new ideas to develop new services marketing using Facebook	0.819			
ETT5	I became a Facebook member with ease	0.834	0.93	0.93	0.641
ETT6	My interaction with my lecturer in Facebook is clear and understandable	0.787			
ETT7	I don't have any problems learning entrepreneurship using Facebook features on my own.	0.806			
ETT8	I find it easy to use Facebook features to run entrepreneurship subject assignments	0.794			
ETT9	I can learnt more about how to handling business when using Facebook features.	0.799			

Cont. Table 4.14
Summary of Assesment Constructs

Items	Construct	Loadings	Cronbach' alpha	Composite Reliability	Average Variance Extracted (AVE)
	Innovation Teaching Method				
IM3	My lecturer in entrepreneurship subject used active learning strategies such as: Case studies	0.833			
IM1	My lecturer in entrepreneurship subject used active learning strategies such as: Lectures	0.828	0.89	0.89	0.677
IM5	My lecturer in entrepreneurship subject help me to prepare a business plan to understand the entrepreneurial process.	0.810			
IM7	My lecturer in entrepreneurship subject trained student how to developed skill in using modern multimedia teaching technologies while doing business simulations.	0.820			

Cont. Table 4.14
Summary of Assesment Constructs

Items	Construct	Loadings	Cronbach' alpha	Composite Reliability	Average Variance Extracted (AVE)
	Innovative Work Behaviour				
IWB1	Pay attention to issues that are not part of teaching work	0.617			
IWB10	Put effort in the development of new product design or services	0.686			
IWB2	Wonder how things can be improved if integrated modern multimedia technology into the teaching practice.	0.842			
IWB3	Always search out new working methods, techniques or instruments	0.838			
IWB4	Generate original solutions for problems arise	0.685	0.93	0.93	0.605
IWB5	Finding new approaches to execute teaching tasks	0.812			
IWB6	Always make important organizational members enthusiastic for innovative ideas	0.841			
IWB7	Always attempt to convince people to support an innovative idea	0.830			
IWB8	Had introduce innovative ideas into teaching practices	0.787			
IWB9	Contributed to the implementation of new ideas	0.802			

Cont. Table 4.14
Summary of Assesment Constructs

Items	Construct	Loadings	Cronbach' alpha	Composite Reliability	Average Variance Extracted (AVE)
	Learning Capabilities				
LC1	Actively learn new things related to new teaching methods from another sources.	0.791			
LC10	Applied skill and knowledge of using ICT to actual practice.	0.732			
LC11	Involved any activities related entrepreneurship education	0.739			
LC2	Relates the teaching to the professional environment.	0.774			
LC3	Learned as much as can in his/her field.	0.856			
LC4	Know how to learn to improve his/her teaching.	0.814	0.94	0.94	0.612
LC5	Learn from a variety of means.	0.808			
LC6	Be able to learn proactively.	0.782			
LC7	Capable learning independently.	0.763			
LC8	Always keep up to date knowledge in entrepreneurial field.	0.782			
LC9	Created new ways of doing things.	0.754			

Cont. Table 4.14
Summary of Assesment Constructs

Items	Construct	Loadings	Cronbach' alpha	Composite Reliability	Average Variance Extracted (AVE)
	Social Integration				
SI1	Shared teaching problems with others to motivated students take interest in their learning process.	0.806			
SI10	Help students learn effectively.	0.743			
SI11	Submit meaningful questions to students during lessons.	0.764			
SI2	Always gives students the freedom to express creativity in carrying out the assignment.	0.794			
SI3	Have the knowledge on how to cooperate with others.	0.828	0.94	0.94	0.620
SI4	Always tells students about the expected competency to be gained in the subject.	0.834			
SI5	Always allows and encourages the participation of students in every teaching and learning activity.	0.819			
SI6	Capable of maintaining a dynamic interaction with student.	0.810			
SI7	Be able to guided students who are weak in class.	0.768			
SI8	Always help students think critically during lessons.	0.795			
SI9	Convincing students that they can do the exercises or assignments well.	0.689			

4.6.4 Discriminant Validity

For more confirmation about construct validity of the outer model, it is very important to establish the discriminant validity. Therefore, before testing the hypotheses through the path analysis, discriminant validity testing is a mandatory. Its measures show the degree to which items differentiate among constructs. In other words, the discriminant validity shows that items used different constructs do not overlap. In addition, the discriminant validity of the measures shared variance between each construct and, therefore, should be greater than the variance shared among distinct constructs (Compeau, Higgins, & Huff, 1999).

For the purpose of this study, the discriminant validity of the measures was confirmed by employing the method of Fornell and Larcker (1981). As explained in Table 4.15, the square root of AVE for all constructs was replaced at the diagonal elements of the correlation matrix. The discriminant validity of the outer model for this study was confirmed where the diagonal elements in the table were higher than the other elements of the column and row in which they are located. As a result of the above testing for construct validity of the outer model, it is assumed that the obtained results pertaining to the hypotheses testing should be reliable and valid.

Table 4.15
Fornell Larcker Table

Variables	ELP	ETT	IM	IWB	LC	SI
ELP	0.773					
ETT	0.676	0.801				
IM	0.614	0.811	0.823			
IWB	0.086	-0.037	-0.015	0.778		
LC	0.094	0.128	0.109	-0.018	0.782	
SI	0.158	0.302	0.303	-0.004	0.380	0.787

4.7 Assessment of the Structural Model

With the adequacy of measurement model established, the structural model was evaluated and hypothesis were tested. The structural model indicates the causal relationships among the latent constructs in the research model. Assessment of structural model was done first by determining the predictive power of the model and second by analyzing the hypothesized relationships among the latent constructs proposed in the research model.

In order to test whether there is moderation effect exists, three (3) step hierarchical regression by Bryman and Cramer (1997); Cohen and Cohen (1983); Cramer (2003) were being used, but, in this study, bootstrapping procedure was used to test the significance of the moderating effect (Hair, et al., 2014) of innovation work behaviour on the relationship between innovation method in teaching (H5a), educational technology tools (H5b), learning capability (H5c), and social integration (H5d), and entrepreneurship lecturer performance.

The moderation model in figure 4.6 represent by running Smart PLS-SEM algorithm and bootstrapping respectively testing the main effects between independent variables and dependent variable with the moderator variable inclusive.

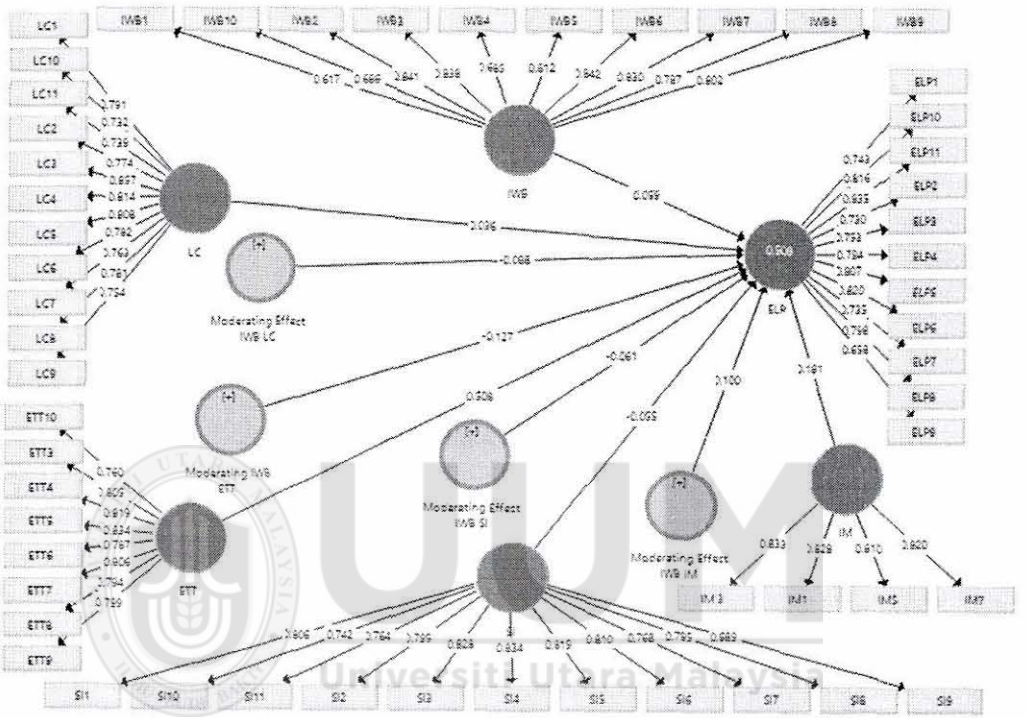

Figure 4.6
The Model PLS-SEM with Structural Dimensions

4.7.1 Results of Direct Relationship

In the present study, all the hypothesized relationships were supported based on the result of the structural equation modelling. The path estimates for the hypothesized model are shown in Table 4.16. All the hypothesized relationships between exogenous variable were found the relationship the entrepreneurship lecturer performance except the direct relationship between learning capability.

4.7.1.1 Objective 1

Conforming to the theoretical expectations, the standardized parameter estimate between innovation method in teaching and entrepreneurship lecturer performance was positive and statistically significant (β= 0.207,t=2.922, p<0.001) (Table 4.16). Thus, H1 which stated that innovation method in teaching positively influences entrepreneurship lecturer performance is supported. This result indicates that when lecturers are involved in the teaching process, it will lead them to be better able to accept the educational entrepreneurship objectives and the performance goals, thus enhancing their teaching commitment.

4.7.1.2 Objective 2

The second hypothesis, H2 which predicted that educational technology tools positively influences the entrepreneurship lecturer performance is also supported (β= 0.527, t= 7.543, p<0.000). This finding revealed that lecturers who use educational technology tools (Facebook) and exert high level of commitment appear to have high performance.

4.7.1.3 Objective 3

The third hypothesis, H3 which proposed that between lecturers' learning capabilities positively influences entrepreneurship lecturer performance. The result from this study are not supported in the H3 (β= 0.026,t= 0.509, p<0.611) . This finding confirms that the direct link between lecturers' learning capabilities and entrepreneurship lecturer performance is not significant.

4.7.1.4 Objective 4

The forth hypothesis, H4 proposed that the lecturers' social integration influences the entrepreneurship lecturer performance. The result from this study supported this hypothesis (β= 0.068,t= 1.980, p<0.001) and the finding indicates that the direct link between the lecturers' social integration and entrepreneurship lecturer performance is significantly positive. *p<0.01

4.7.2 Summary Results Hypothesis of Direct Relationship

Once the goodness of the outer model has been confirmed, the next stage was to test the hypothesized relationships among the variables. By running PLS algorithm using Smart-PLS, the hypothesized model was tested. Therefore, the path coefficients were generated as illustrated in the Figure 4.6.

The Table 4.16 shows the results of the structural model. The Path co-efficient using T-Value >1.65 shows the coefficient is significant in test done on the one-way. T-Value >2.33 shows the coefficient is significant in testing done on the bilateral.

Table 4.16
The Results of the Inner Structural Model

Hypotheses	Exogenous	Endogenous	β-Value	T-Value	P-Value	Decision
HI	IM	ELP	0.207	2.922	0.001*	**Supported**
H2	ETT	ELP	0.527	7.543	0.000*	**Supported**
H3	LC	ELP	0.026	0.509	0.611	**Not supported**
H4	SI	ELP	0.068	1.980	0.001*	**Supported**

*p<0.01

4.7.3 Results of Moderating Effect of Innovation Work Behaviour

Moderator can be explained as a variable that affects the direction and/or strength of a relation between independent and a dependent or criterion variable (Baron & Kenny, 1986). Moderator variables are typically introduced when there is an unexpectedly weak or inconsistent relation between a predictor and a criterion variable. According to Hair et al. (2014), whilst assessing the moderation, the construct bears the potential to directly influence the relationship between the exogenous and endogenous latent variables.

The objective in this study is to examine the moderating effect of innovative work behaviour on the relationships between innovation method in teaching, educational technology tools, lecturers' learning capabilities, and lecturers' social integration and entrepreneurship lecturer performance. This study employed product indicator approach in PLS SEM to estimate the moderating effect of innovative work behaviour on the relationship of exogenous and endogenous variables. With regards to moderating effect, there could be a situation where the moderator could alter the direction of a relationship between two variables in the same model.

4.7.3.1 Objective 5

The sign of relationship between the interaction term (IWB*IM) and ELP were statistically negative but significant, IWB*IM →ELP, $\beta = -0.035$ ($p<0.001$). Thus, inverse in the predicted direction, which shows that IWB dampens the positive relationship between IM and ELP.

4.7.3.2 Objective 6

Table 4.17 showed that the relationship between innovation method in teaching, educational technology tools, social integration and entrepreneurship lecturer performance were moderated by innovation work behaviour. The results show that innovation work behaviour strengthens the positive relationship between educational technological tool and entrepreneurship lecturer performance, IWB*ETT →ELP β = 0.369 ($p<0.001$).

4.7.3.3 Objective 7

However, the results also showed that the interaction terms between IWB*LC → ELP β=0.032 ($p<0.474$) were not significant. This shows that innovation work behaviour does not moderate the relationship between learning capability at $P<0.005$ level of significance. Hence hypothesis 7, was not supported.

4.7.3.4 Objective 8

Additionally, the result of the analysis shows that innovative work behaviour strengthens the positive relationship between social integration and lecturer performance IWB*SI →ELP β = 0.086 ($p<0.001$).

4.7.4 Summary Result Hypothesis of Moderating Effect

The moderating effect of innovation work behaviour was introduced in structural model in Figure 4.6 (*The Model PLS-SEM with Structural Dimensions*). First the study examined if the moderator (innovation work behaviour) has a significant direct effect on the dependent variable (Entrepreneurship Lecturer Performance) i.e. H5

predicted that the innovation work behaviour positively influences the entrepreneurship lecturer performance. The result of the analysis supported this hypothesis (β=0.311; p<0.00). Next the interaction variable was entered to analyse the moderation effects in hypotheses 5, 6, 7, and 8.

Table 4.17

Structural Model Assessment with Moderator

Hypotheses	Exogenous	Endogenous	β-Value	T-Value	P value	decisions
H5	IWB*IM	ELP	-0.353	3.518	0.001*	**Supported**
H6	IWB*ETT	ELP	0.369	3.564	0.001*	**Supported**
H7	IWB*LC	ELP	0.032	0.717	0.474	**Not supported**
H8	IWB*SI	ELP	0.086	1.966	0.001*	**Supported**

*p<0.01

Based on the result of this study, innovation work behaviour can be regarded as moderator on the relationship between innovation method in teaching, educational technology tools, social integration and entrepreneurship lecturer performance. Understanding this kind of moderator is significant because innovation work behaviour can either strength the relationship or change the form of relationship between innovation method in teaching, educational technology tools, learning capability, social integration and entrepreneurship lecturer performance.

4.8 Assessment of Predictive Relevance (Q^2)

One of the processes in the data analysis is using the PLS-SEM analysis method to test the relevance of the model which is to determine the predictive capability of the

research model developed. The blindfolding procedure suggested by Geisser and Stone was used to assess the Q^2 (Geisser, 1974; Stone, 1974). Blindfolding is the technique to predict the strengths and capabilities of the research model through endogenous variables. Testing the predictive relevance or Q square (Q^2) using the construct-validated redundancy approach is showed in Table 4.18. Q^2 also known as Stone-Geisser's test is only done for endogenous constructs with only reflective indicators. Since, this study has only one endogenous and reflective construct, it is only tested for the entrepreneurship lecturer performance.

Since this study uses a reflective indicator, Q^2 assessment is necessary (Chin, 1998; Hair et al., 2014). This is because the validated redundancy method measures Q^2 thoroughly using estimates of both the models of the study (the measurement model and the structural model). According to Reinartz, Haenlein, & Henseler, (2009) research model with Q^2 greater than zero is considered to have predicted relevance. Additionally, the model of the study with a higher positive Q^2 value suggests more relevant predictions for the study. Q^2 is calculated as shown below.

$$Q^2 = \frac{1 - SSE}{SSO} \qquad (eq\ 4.1)$$

$$Q^2 = \frac{1 - 2950.24}{4125.00}$$

$$Q^2 = 0.29$$

In this study, as shown in table 4.18, the value of Q^2 for this study model is (Q^2 =0.29), which is larger than 0 suggest that the model has predictive relevance for a certain

endogenous construct (Hair et al., 2017). This value shows the effect on endogenous variable (entrepreneurship performance lecturer) is more than 0, this means model has the predicted relevance.

Table 4.18
Cross-Validated Redundancy Q^2

Variables	SSO	SSE	Q^2 (=1-SSE/SSO)
Entrepreneurship Lecturer performance	4125.00	29250.24	0.29

Thus, the findings are summarized as a measure of the relevance of predictive value for the endogenous variables (entrepreneurship performance lecturer) has a moderate impact ($Q^2 \geq 0.15$). Based on the standards by Hair et al. (2014). The relevance of predictive value of entrepreneurship lecturer performance is moderate for the study model.

4.9 Assessment of Effect Size (f^2)

Another processes structural model assessment PLS-SEM is effect size which indicates the relative effect of a particular exogenous latent variables on endogenous latent variable(s) by means of changes in the *R*-squared (Chin, 1998). It is calculated as the increase in *R*-squared of the latent variable to which the path is connected, relative to the latent variable's proportion of unexplained variance (Chin, 1998).

The R-square value of the dependent variables in this is 0.485 As defined in the literature, R square is the indicator that shows the amount of variance explained in the endogenous variable by its exogenous variable. According to Hair et al. (2010), it

reflects the quality of the variables included in the model. However, there are many criteria that can be used as guidelines in assessing the level of R square. For instance, Hair et al. (2017) criterion stated that R square value equal 0.75 or more is considered substantial, 0.50 moderate, and 0.25 weak. Moreover, Chin (1998) criterion state that R square value equal or more than 0.67 is substantial, 0.33 moderate, and 0.19 weak.

Thus, the effect size could be expressed using the following formula (Cohen, 1988; Hair et al., 2017):

Effect size: = (4.2)

$$Effect\ Size = \frac{R^2\ included - R^2\ Excluded}{1 - R^2 included}$$

Cohen (1988) describes f^2 values of 0.02, 0.15 and 0.35 as having weak, moderate, strong effects respectively. The calculation below shows the respective effect sizes of the latent variables of the structural model.

$$Effect\ Size = \frac{0.485 - 0.472}{1 - 0.485}$$

$$Effect\ Size = \frac{0.013}{0.515}$$

$$Effect\ Size, f^2 = \mathbf{0.03}$$

Table 4.19
Effect size

Endogenous Latent Variables	**R-squared**		**f-squared**	**Effect Size**
	Included	**Excluded**		
Entrepreneurship Lecturer Performance	0.485	0.472	0.03	Small

Thus, the effect size in this study as shown in Table 4.19 are 0.03 which is small effect respectively.

4.10 Goodness-of-Fit (Gof)

Goodness-of-fit (GoF) for PLS path modeling refers to the geometric mean of the average AVE (average communality) and average R^2 for the endogenous constructs (Tenehaus et al., 2005). It is a global fit measure for PLS based on R^2 for the endogenous variables, The purpose of measuring GoF is to obtain the cut-off values for PLS models validation (Akter et al., 2010). The formula to measure the GoF is as follows: (Wetzel et al., 2009).

$$GoF = \sqrt{(Average\ AVE)(Average\ R^2)} \qquad \text{(Eq 3)}$$

In this study the GoF value is 0.634 for the complete main effects (model with no moderator variable) model, which exceeds the cut-off value of 0.36 for large effect sizes of R2. As such, it can be concluded that this model is large of effect or strength and has better explaining power in comparison with the baseline values (GoFsmall = 0.1, GoFmedium = 0.25, GoFlarge = 0.36). This value also provides adequate support to validate the PLS model globally (Wetzel et al., 2009).

$$GoF = \sqrt{(0.6255)(0.485)}$$
$$GoF = \sqrt{0.3033675}$$
$$GoF = 0.551$$

It can be concluded that this model is large of effect GoF.

4.11 Summary of Findings

From the Table 4.20, the results of the hypotheses testing indicate that six out of eight hypotheses were supported while two hypotheses were not supported. Specifically, in this study, innovation method in teaching, educational technology tools, and lecturers' social integration were observed as an independent variable showing significant positive direct relationship with the entrepreneurship lecturer performance (dependent variable). But lecturers' learning capabilities did not predict entrepreneurship lecturer performance. Additionally, innovative work behaviour moderates the relationships between innovation method in teaching, educational technology tools, and lecturers' social integration.

Table 4.20
Summary of Findings Hypothesis

Hypothesis	Hypothesis Path	Decision
H1:	There will be a positive relationship between innovative method in teaching and the performance of entrepreneurship lecturers.	**Supported**
H2:	There will be a positive relationship between educational technology tools and the performance of entrepreneurship lecturers.	**Supported**
H3:	There will be a positive relationship between learning capabilities and the performance of entrepreneurship lecturers.	**Not Supported**
H4:	There will be a positive relationship between social integration and the performance of entrepreneurship lecturers.	**Supported**
H5:	IWB moderates the relationship between innovative teaching method and the performance of entrepreneurship lecturers.	**Supported**
H6:	IWB moderates the relationship between educational technology tools and the performance of entrepreneurship lecturers.	**Supported**

Table 4.20 (continued)

H7:	IWB moderates the relationship between learning capabilities and the performance of entrepreneurship lecturers.	**Not Supported**
H8:	IWB moderates the relationship between social integrations and the performance of entrepreneurship lecturers.	**Supported**

4.12 Summary

This chapter discusses the data analyses and findings of the study. It begins with an elaboration on the response rate of the study, particularly 560 questionnaires were sent to respondent and 450 returned questionnaires but only 375 with 83.33% usable for data analysis; showing that it's fulfilled the rate of return of questionnaire responses which must be less than 70 % (Macmillan & Schumacher, 2006).

In the data screening and preliminary analysis, the detection and treatment of missing data was conducted, followed by assessment of outlier, which confirms that there were no outliers within the data and all the responses are valid to be used for analysis. Besides, tests of normality, and multicollinearity were also undertaken and the results also reveal that there is no threat of non-normal distribution of the data.

On the demographics, the profile of the respondents is diversified in terms of the year of study, gender, race, department, and family history in business and intent to do a business. For the purpose of this study, descriptive analysis was undertaken to examine the level of variables factors, which comprise of entrepreneurship lecturer

performance, innovation method, educational technology tools, lecturers' learning capability, social integration and innovation work behaviour.

Before testing the study's hypotheses, the measurement model, outer model, was assessed through the PLS-SEM technique. In order to verify the validity and reliability of the instrument, factor analysis was performed. As a result, 8 items were deleted due to low factor loading and reliability analysis which confirms that all variables are reliable to measure the constructs.

Finally, assessment of structural model was done by determining the predictive power of the model and second by analyzing the hypothesized relationships among the latent constructs proposed in the research model. The results of the hypotheses testing indicate that six out of eight hypotheses were supported while two hypotheses were not supported. In the following chapter, these findings are discussed in more detail to shed more light on the results and their theoretical and managerial implications.

CHAPTER FIVE
DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter includes several sections. Section one introduces the chapter while section two recapitulates the findings of the study. In section three, the discussion of the findings based on the research hypotheses was provided and the results linked to previous studies. Next, section four, discusses the contribution of the study under which the theoretical, practical and methodological implications of the study are presented, while section five presents limitations of the study. Furthermore, in section six, recommendation was presented and in section seven, suggestions for future research direction was offered. Lastly, in section eight, general conclusion of the study is drawn.

5.2 Recapitulation of the Study

The main objective of this study is to investigate the effectiveness of teaching factors for entrepreneurship lecturer performance in achieving higher levels of entrepreneurship teaching performance in the context of Polytechnic in Malaysia's Technical and Vocational Education and Training (TVET) institutions. Thus, this research determined and examined the relationship between four effectiveness teaching factors, namely: innovative method, educational technology tool, lecturers' learning capabilities and lecturers' social integration with entrepreneurship lecturer performance under the moderating effect of innovation work behaviour.

This study therefore, answers the following questions:

1. What is the relationship between innovative teaching methods and entrepreneurship lecturer performance in polytechnic?

2. What is the relationship between educational technology tools and entrepreneurship lecturer performance in polytechnic?

3. What is the relationship between lecturers' learning capabilities and entrepreneurship lecturer performance in polytechnic?

4. What is the relationship between lecturers' social integration and entrepreneurship lecturer performance in polytechnic?

5. What is the moderating effect of innovative work behaviour on the relationship between innovative teaching methods and entrepreneurship lecturer performance in polytechnic?

6. What is the moderating effect of innovative work behaviour on the relationship between educational technology tools and entrepreneurship lecturer performance in polytechnic?

7. What is the moderating effect of innovative work behaviour on the relationship between learning capability and entrepreneurship lecturer performance in polytechnic?

8. What is the moderating effect of innovative work behaviour on the relationship between social integration and entrepreneurship lecturer performance in polytechnic?

Factor analysis was conducted on each of the variable in the present study. The results of the factor analysis with satisfactory loadings were produced between four independent variables and entrepreneurships' lecturer performance; adapted from the Generic Teaching Model for Entrepreneurship (Fayolle & Gailly, 2008), The Diffusion of Innovation (Rogers, 2003), and Theory of Planned Behaviour (Ajzen, 1991).

5.3 Discussion

This section discusses the results involving the direct relationships between innovation method and lecturer performance, educational technology tools and lecturer performance, learning capabilities and lecturer performance and social integration and lecturer performance. In addition, the findings of the moderating effect of innovation work behaviour on the relationship between innovation method in teaching, educational technology tools, learning capability, social integration; and entrepreneurship lecturer performance are discussed.

5.3.1 The Relationship Between Innovation Method and Lecturer Performance

The finding of this study came up with a significantly positive relationship between innovation method in teaching and entrepreneurship lecturer performance. As discussed earlier, the first objective of the present study is to investigate the relationships that exist between innovation method in teaching and lecturer performance. The standardized parameter estimate between innovation method in teaching and entrepreneurship lecturer performance was positive and statistically significant (β= 0.207, t=2.922, p<0.001). This result indicates that when lecturers are involved in the teaching process, they will be able to accept the educational

entrepreneurship objectives and the performance goals, thus enhancing their teaching commitment.

The finding is in line with the findings of past studies by Kirby (2006); Blenker et al., (2006); Shambare (2013) mention that the use of innovative teaching methods improved students' knowledge and skills and is positively associated with their increased entrepreneurial motivation, innovation, and the capability to understand how to start and sustain a new business venture. Similarly, teaching entrepreneurship to individuals who are strongly committed to their venture creation projects, to professionals and other practitioners committed to the field of entrepreneurship or to students who have neither intention nor a concrete project is very different in nature. Although some teachers tend to overemphasize it, pedagogy is not an end by itself.

This study therefore, highlighted that the most popular teaching methods are an effective entrepreneurship education and a combination of teaching methods. This is consistent with the study by Solomon et al (2002) which reported that the most popular teaching methods in entrepreneurship education are the creation of business plan, case studies, and lectures. The evaluation of each teaching method in entrepreneurship course as well as other courses in entrepreneurship curriculum gives the lecturer a better opportunity to decide the best teaching methods in a course (Arasti, 2012).

5.3.2 The Relationship Between Educational Technology Tools and Lecturer Performance

The finding of this study revealed that there is a significantly positive relationship between educational technology tools and entrepreneurship lecturer performance (β=

0.527, t= 7.543, p<0.000). This finding showed that subordinates technology tools in Facebook with high level of lecturer commitment appear to have high performance.

Issues currently under discussion focus on how Facebook can improve students' performance. Moreover, there are no researches conducted in the past revolving around this issue particularly, entrepreneurship lecturer's performance. Therefore, this present study has added value to the literature of Facebook as an appropriate educational tool, following the findings of this study that found significant and positive relationship to the performance of the lecturer.

In view of this, it is useful to know the relationship between Facebook as an educational tool and the lecturers' entrepreneurship teaching performance because Facebook can be used for work related purposes. Additionally, new business relationships are formed and existing ones are maintained. Furthermore, connecting people with shared interests is a favourable educational tool of this platform owing to its structure and various utilities. The big issue is whether lecturers in the Polytechnic know how to be up-to-date when using software applications like Facebook and others to generated new ideas and develop new product designs or services? The answer is positive because from the analysis of the data taken from the students' rating, it showed that lecturers in Polytechnic know and are up-to-date in the use of technological educational tools.

Facebook is being considered as an entrepreneurship educational tool in Polytechnics because of its beneficial qualities such as enabling peer feedback, goodness of fit within a social context, and interaction tools. Further supporting this is the indication

that most Facebook users are between 18 and 25 years old. In addition, Bumgarner, (2007) confirmed that the users are mostly university students. Hence, it can be concluded that Facebook can be a useful educational tool especially through provision of an avenue for active participation and collaboration.

From these findings, explaining how students had a positive attitude to utilize Facebook as entrepreneurship educational tool and the relationship between students' Facebook adoption processes and students' educational use of Facebook is further supported by Sacide and Yasemin, (2010) who found a positive relationship between users' purposes in using Facebook and the educational usage of Facebook.

Furthermore, the enthusiasm to interact with their friends, relatives and classmates on Facebook has a positive influence in their applying of Facebook as an entrepreneurship educational tool. Interestingly, both the amount and level of engagement were positively correlated with academic performance (although these relationships were weak and insignificant), they are however consistent with the findings of Carini et al. (2006).

The findings of the present study are further in line with Wang, Lin, Yu and Wu (2013) which reveals positive effect of Facebook use on in-class engagement. Although using Facebook without instructor guidance doesn't promote academic engagement, online student engagement in doing the assessment where lecturers are involved can be increased using Facebook. Furthermore, since students prefer the educational entrepreneurial use of social media to be informal, Facebook may also be used to optimize independent, extra-curricular student engagements.

In this study, social influence is defined as one's perception of how the users' significant others will react upon performing a behaviour, in our case, joining this new social environment (Facebook). From the questionnaires analysis, Facebook is revealed as social utility used by many students and lecturers and social norms must have a significant role in individuals' use of this educational tool. While some members join Facebook to connect with some social environments or to maintain communication with existing friends, some become members of groups upon their friends' invitation. These shows that social influence has a role in student's decisions to take part in social networking.

Therefore, this present study concluded that students who accessed the Facebook website of a lecturer, high in self-disclosure anticipated higher levels of motivation, affective learning, and a more positive classroom climate, which can lead to better student outcomes.

This finding is consistent with those reached by Mazman and Usluel (2010) which has a positive influence in their perceptions of Facebook as an educational tool, and it may easier for students to acknowledge the potential advantages of this tool to share educational materials, and to communicate with their classmates and lecturers.

5.3.3 The Relationship Between Learning Capabilities and Lecturer Performance

The outcome of this study showed that, there is not significant relationship between lecturers' learning capabilities and entrepreneurship lecturer performance (β= 0.026, t= 0.509, p<0.611). The potential reason for this outcome could be because there is not

much up to date knowledge in entrepreneurial field and inadequate or lack of exposure to any activities related entrepreneurship education. This is in line with the findings of Zhu et al. (2013) which indicated that lecturers' learning capability is not a significant predictor for lecturers' teaching performance.

However, the findings of this study contradict the study upheld in the contexts of school environment, that lecturers' willingness to learn is a crucial factor for implementing educational innovation performance by Konings et al. (2007); Chen (2002). Even the lecturers' learning capability seems not to be consistent with the scholar. The potential reason for this would be very different in social, economic, education level and educational systems of the countries; whereas this study used the Polytechnics' students as respondents to evaluate the lecturers' applied skill and knowledge of using ICT to actual practice in the classroom.

Zahari and Zamberi (2013) pointed out that there are some methods in entrepreneurship that can be taught effectively in Malaysian polytechnics. The finding confirmed that polytechnic lecturers are still not imbued with the capabilities of learning something new in the teaching of entrepreneurship. Moreover, experience enriches their knowledge (Wu & Wu, 2017). These are indeed the characteristics needed among lecturers of entrepreneurship education in the Malaysian polytechnics.

In forming polytechnics' lecturer attitudes in being innovative towards their pedagogical practices, the education of lecturers plays a significant role particularly in terms of content and method. Polytechnics' lecturers should be able to undertake research that enables systematic gathering of data about the implemented innovation

with the aim of providing valuable judgment regarding the innovation and/or providing a basis for improvement. On the other hand, Fullan (1992); Valenčič Zuljan (1993) mentioned that successful innovating teaching is primarily derived from constant practice and with the help of experts.

It can be suggested that entrepreneurship lecturers' learning capabilities are very important for teaching performance but from the finding of this study, it indicated that entrepreneurship lecturers' learning capability become necessary for review. Ball (1997) stated that lecturers' sincere desire to help students and to believe that students have learned may lead them to ask more questions and discuss their learning experience in the class which leads to better performance. However, to link the insignificant result from this study with this finding, it could be that the lecturers feel burdened to learn something new which is not their field or area of expertise (for example lecturers from engineering going to entrepreneurship) caused the inconsistent finding.

5.3.4 The Relationship Between Social Integration and Lecturer Performance

The findings of this study revealed that there is a significant positive relationship between lecturers' social integration and the entrepreneurship lecturer performance. The result from this study supported this hypothesis (β= 0.068, t= 1.980, $p<0.001$) indicating a positive relationship between the lecturers' social integration and entrepreneurship lecturer performance.

This finding indicates that entrepreneurship lecturers in Polytechnic need to cooperate with students and build positive human relationships. Some characteristics of social

integration for lecturer performance are also mentioned in previous literature sections. Consistent with the finding in this study is the finding of Pantic and Wubbels (2010) who found that social integration had a positive relationship with lecturer performance. Most applications related to innovation such as doing something new is considered difficult for students, in addition the students do not have entrepreneurship background need to accept new innovations because they have another subject learn more.

Lecturers who are more capable of social communication, should be able to motivate students, always give students the freedom to express creative abilities in carrying out their assignments, be capable of maintaining a dynamic interaction with students and have the courage to face challenges for better performance in applying the innovative thoughts in teaching practices.

5.3.5 The Moderating Effect of IWB on the Relationship Between Innovative Method and Lecturer Performance

According to the results obtained, innovative work behaviour is found to be dampening the relationship between innovation method in teaching and entrepreneurship lecturer performance. Innovations in Polytechnics institution can bring about new instructional objectives or didactic methods and changes in work processes such as collaboration between lecturers and new work tasks of lecturers. The innovations used are not restricted to the classroom but include the wider context within and outside the classroom. Thus, the findings found that the results analysis between IWB*IM →ELP $\beta = -0.035$ ($p<0.001$) are supported.

Although the key to a successful entrepreneurship educator is to find the most effective way to manage the teachable skills and identify the best match between student needs and teaching techniques. The question has been raised whether there is pedagogical recipe to teach entrepreneurship, and the choice of techniques and modalities depends mainly on the objectives, contents and constraints imposed by the institution (Arasti, 2011). Inappropriate teaching methods will negatively impact on the outcomes of entrepreneurship programs and it is important to develop a teaching program that will develop capable and skilled entrepreneurs but very limited studies investigated this subfield of teaching method.

The relationship between entrepreneurship lecturers' performance is influenced by innovation method are in the hypothesizing statement. Therefore, this research hypothesized that the relationship between innovation teaching methods is stronger for entrepreneurship lecturer performance. As Rothwell (2002) rightly point out that a lecturer who applied the innovation integrative methods in teaching should have competence in teaching performance. From the analysing, moderation effect is present, thus in this research it is assumed that the strength of the relationship between innovation teaching methods and entrepreneurship lecturer performance is mitigating.

Thus, in this study the role of innovation work behaviour as a moderator was supported and it indicates that innovative teaching method may become necessary today because it is significant for the entrepreneurship lecturers to increase their performance. It appears that the moderation role of innovation work behaviour, whether mitigating the relationships is reliant on the nature of independent variable (entrepreneurship lecturer performance).

5.3.6 The Moderating Effect of IWB on the Relationship Between Educational Technology Tools and Lecturer Performance

According to the result obtained, innovative work behaviour is found to significantly strengthen positively possessing a moderating effect on the relationship between educational technological tools and entrepreneurship lecturer performance. Instrument for measuring innovative behaviour are adapted from Messmann & Mulder (2012). The finding shows that IWB has moderating effect on the relationship between educational technology tools and lecturer performance (i.e., IWB*ETT →ELP β = 0.369 $p<0.001$). Hence hypothesis H5 (B) is supported.

Previous studies showed that innovative behaviour is a contributor to performance improvement (Leong & Rasli, 2014; Bjornali & Storen, 2012; Messmann & Mulder, 2012; Nik Azida et al, 2010) and the finding in this study is supported. However, in the context of education, studies on activities that lead to innovative behaviours; the participation of lecturers in process and development of innovation are still lacking (Messman et al., 2010). Additionally, lecturers face some constraints to use innovative behaviours as triggers and innovation in teaching and learning in the classroom stating that the factors that constrain the teacher exhibit innovative behaviours are perceptions of their beliefs and tend to be non-innovative. This is in line with the study of Nemeržitski et al. (2013) who also got the same finding.

5.3.7 The Moderating Effect of IWB on the Relationship Between Learning Capabilities and Lecturer Performance

The findings in this study showed that IWB*LC → β = -0.086 ($p<0.005$*) as such, the moderating hypothesis is not supported. The moderating effect of IWB on the

relationship between learning capabilities and lecturer performance does not interact with the independent variable and does not significantly correlate with the independent and dependent variable.

Entrepreneurship lecturers can be innovative by providing up-to-date materials for the students with advance knowledge application while doing the entrepreneurship assignment. Thus, lecturers also must make their students understand their course requirement, procedure, and grading criteria. As a necessity, the world outside the classroom is equally important. Moreover, intelligent activities often depend upon resources beyond the individuals themselves such as physical tools and notational system.

In addition, there is a research about the analysis lecturers' activities on developing innovations in teaching. This research has acknowledged the contribution and role in the process of innovation and how their active contribution can be stimulated and nurtured. In the result of this study, IWB has no effect as a moderator for learning capabilities factor. This is because researchers see students responding that most entrepreneurship lecturers who teach them do not have the ability to learn entrepreneurship and are not capable of learning independently.

This answer the question in the problem statement that the polytechnic entrepreneurship lecturers do not have the ability to learn new things, perhaps because they are busy to achieve the KPI institution. So, that the lecturer did not have time to study entrepreneurial knowledge.

5.3.8 The Moderating Effect of IWB on the Relationship Between Social Integration and Lecturer Performance

The result of this study showed that IWB has a significant and positive moderating effect on the relationship between lecturer performance. This implies that, innovation work behaviour strengthens the positive relationship between social integration and entrepreneurship lecturer performance. Thus, inspection of individual interaction terms between IWB*SI →ELP $\beta = 0.086$ ($p<0.001$*) are supported. A study to identify the effect of IWB moderator on the relationship between social integration and lecturer performance at all levels are very few and hard to find in literature. Thus, the finding from this study can add to the availability of literature in an effort to increase knowledge and impact on IWB applications on the performance of lecturers.

This study found that if an entrepreneurship lecturer has a high social integration, then the resulting performance is higher. According to Khairudin and Islam (2000), their study identified three specific areas for teachers' innovative teaching methods and delivery design skills such as good communication skill. The findings are in line with the results in this study whereas entrepreneurship skills among educators are important because it promises great potential in developing innovative human capital especially when faced with current educational challenges.

The results obtained in this study have a link with research of Koster et al. (2014) who concluded that an innovative lecturer should have the ability to communicate with students from different backgrounds. Moreover, the ability to communicate with students helps to enhance the work performance of lecturers to educate learners.

The findings of this study indicate that entrepreneurship lecturers should have the need for achievement, leadership, creativity, confidence, linkage, initiative, risk taking, imagination and ability to make analyses. The results of this research support the idea of the theory of reasoned action by Ajzen & Fishbein (1981) which reveals that individuals make balanced judgment caused by the information available and a cognitive symbol of readiness to execute a known behaviour.

Many researchers have a continuous moderator variable and believe it can affect the strength of one specific relationship between two latent variables. Thus, the findings in this research agree with the study by Messmann et al. (2010) that innovative behaviours are activities performed by lecturers throughout the innovation process. In this study, limitations about innovative behaviour is one's behaviour to do something beyond creativity and innovation, including the acceptance, creation and implementation of new ideas. Opportunities exist when there is a desire to develop something.

In the field of education, this study further complies with Messmann et al. (2010) explaining that innovative behaviours comprise of outdoor and in-class activities related to innovation (i.e., opportunities exploration, generating ideas, promoting ideas, and realizing ideas). Innovative behaviours can be new teaching methods, changes in the work processes of a teacher and student and collaboration among teachers or new teachers' duties. Innovative behaviour does not only occur during teaching and learning activities in the classroom but includes broader contexts outside the class.

These activities include identifying new ideas to address challenges and problems faced in polytechnics. The interaction among students in mutual support between one another greatly influences the realization of ideas. The innovation work behaviour as a moderating variable is a variable that changes (increases) the otherwise established effect of social integration factors on entrepreneurship lecturer performance.

5.4 Contribution of the study

This section discusses the contribution of the study which is assessed from 3 aspects, namely: theoretical implications, practical implications and methodological implications.

5.4.1 Theoretical Implications

The management of the Department of Polytechnic Education has made a contribution towards the initiative of creating an entrepreneurship platform in every polytechnic to successfully fulfil the vision and mission that has been enacted to bring into reality the creation of jobs. This is in line with the current research findings that requires the teaching of entrepreneurship to include determining who, how and what to teach. The reviews about entrepreneurship teaching performance in this study were from the generic teaching model in entrepreneurship education and the hope is that the findings from this study will be implemented by the polytechnics' top management and the ministry of higher education Malaysia.

Who should be taught entrepreneurship? - Entrepreneurship is already taught at the Engineering Department in Polytechnics. The knowledge of ways of setting up

enterprises is also transmitted in various forms at higher learning institutions. The majors related to management and economics are naturally suited to teaching entrepreneurship. However, entrepreneurship education becomes more difficult in the case of students from technical fields. The issue always raised is when entrepreneurship lecturers lack basic knowledge about the functioning of the economy and managing companies. The results in this study found that the entrepreneurship lecturers' innovative work behaviour could solve this issue by exploring new methods of working and techniques which contribute to the implementation of new ideas.

What is to be taught? - There is a difference between teaching how to start a business and how to become an entrepreneur. The former is relatively easy to achieve, as many institutions offer trainings on how to write a business plan or register a company. The knowledge passed there is easy to teach. Even in the internet, numerous tips of this type can be found. Teaching entrepreneurship is also sometimes reduced to the transfer of knowledge on the ways of managing a company. In both cases, the goal is to provide tools to support potential entrepreneurs in establishing and running a business, rather than stimulating entrepreneurship.

What methods should be used to teach entrepreneurship? - Entrepreneurship should be taught in an active way. In line with these findings, Fayolle (2013) paid attention to active, experiential, learning by doing and real-world pedagogies. Particularly noteworthy, are the experiential pedagogies. It is one of the methods that fully allowed for teaching entrepreneurship (for entrepreneurship), as opposed to teaching about entrepreneurship. Furthermore, this method is certainly included in the definition of

entrepreneurial methods. The students actively assimilate knowledge while engaging in what they do.

Who should teach entrepreneurship? - Entrepreneurship lecturer in a polytechnic should use the active methods, such as the experiential one, require the lecturer to have comprehensive knowledge and change the approach from being a "relay" to being a "promoter", moderator and manager, whose task is to organize the right conditions for experiencing entrepreneurship. Consistent with Fayolle (2013) who believes that entrepreneurship should be taught by comprehensively educated staff. The subject-matter literature does not specify whether the engineering lecturers should have entrepreneurial experience.

A theoretical approach by Fishbein and Ajzen (1975) stated that attitude is a positive or negative feeling in assessing the effect of doing something or a behaviour. Attitudes toward innovation are one of the factors that lead to individual readiness to use and diffuse the innovation in teaching jobs. It is helpful to consider the observation the students gained that the lecturers' positive attitudes towards the use of educational technology tools and the innovation method in teaching have achieved optimum satisfaction among the entrepreneurship students in obtaining learning and teaching effectiveness.

In analysing the entrepreneurship teaching methods and identifying their weaknesses and strengths, this study aimed to introduce a clear and comprehensive classification of the methods appropriate to educational and cultural structure of polytechnic, existing technologies and educational facilities, polytechnics' culture and

communications, budget and technology facilities and lecturers' and students' characteristics. The pattern obtained from this research indicates the teaching-learning methods of entrepreneurship curriculum which can help the entrepreneurship lecturer select an appropriate method of teaching entrepreneurship in class and make sure that the teaching process is on the right path.

Theoretical implication from this study are about entrepreneurship lecturers' mandatory use of Facebook as an educational teaching technological tool, regardless of whether they intend to use it or not; to keep learning to teach the entrepreneurship subjects for engineering students in realizing the mission and vision of the polytechnic institution. This is in line with the research of Brown, Massey, Montoya-Weiss, and Burkman (2002) that in a mandatory use environment, entrepreneurial lecturers need to use certain technology or innovation in teaching. Obviously, this is also in line with Behavioural Intention Theory which is studied by most researchers in TPB and how far the technology dissemination is applied according to DoI Theory.

Past studies have used a variety of conceptual and theoretical frameworks to explain the determinants of influencing a student's desire and the adoption of a technology in the perspective of the students and entrepreneurship lecturer. Most researchers make theories such as TPB and DoI the basis of their research frameworks. This matched the findings in this study that the learning capabilities among entrepreneurship lecturers does not have relationship with teaching performance. It emphasises that in mandatory environment, the removal of attitude constraints will result in an inaccurate representation of the phenomenon. As lecturers are required to use the entrepreneurial performance in doing teaching task, their relationship between determining intention

and attitudes are unrelated. The lecturers are forced to face cognitive inconsistencies by changing attitudes toward technology and entrepreneurial direction in teaching.

Hence, the lecturers' performance in this present study found that the attitude to increase the knowledge and skills for interacting and socializing with students are important factors in establishing the effectiveness of the engineering lecturers' performance whom is mandatory upon them to teach entrepreneurship subject. Theoretical implication in this study entails attitude used in the context of individual factors implementation on entrepreneurship lecturers teaching in the use of technology tools and innovation according to the needs of the entrepreneurship subject.

5.4.2 Practical Implications

Polytechnic management in particular, polytechnic headquarters, ministry of higher education and management of TVET institution who are involved in the entrepreneurship program need to consider age level. This could be a stimulus for the use of technology in entrepreneurial learning, especially for polytechnic students who have awareness about the present digital economy. This is in line with the findings of this research that age affects and is an important factor in influencing one's attitude towards the use of computer application technology.

In addition, access to computers often affects the attitude towards computer usage in line with the government's effort to create digital job opportunities. This is in line with Lauman (2001) who mentioned that studies on home computer access have shown that more positive attitudes exist among computer users who have home computers,

regardless of gender. Therefore, the age difference of the respondents has been studied because age features play an important role in the acceptance of computer usage.

Polytechnic management should also be aware that the adoption and implementation of technology depends on how the technology will benefit them, ease of use, and facilitate them to use. There are many factors associated with acceptance of innovation or new ideas. Consistent with Lina (2007) who states that the success of technology acceptance and innovation is not only determined by how it can process lecturers' teaching on student ability to learn well, but is also determined by the level of individual acceptance of the application of such technology and innovation.

The findings in this study demonstrate the advantages of technology itself as an important factor in helping lecturers receive and use technology. The ability of polytechnic entrepreneur lecturers to learn something that is not their field is very low and has a negative attitude in the implementation of entrepreneurship subject teaching. In relation to Chau and Hu (2002), to be accepted by individuals, technology is at least useful for their work. The technology and tools used must have many advantages and should not be difficult to use.

However, the good attitude and ability to interact with, eagerly seen by the students as a lecturer's entrepreneurial factor that can be assessed well and positively by the students and this shows a positive significance in producing a competent and effective lecturer and social integration.

5.4.3 Methodology Implications

A very important methodological contribution in the present study relates to the use of PLS-SEM modelling evaluations to determine the psychometric properties of each latent variable. In particular, the present study has succeeded in assessing psychometric properties of each latent variable in terms of convergent validity and discriminant validity. The Psychometric properties checked were individual item reliability, AVE and composite reliability of each latent variable. Furthermore, the convergent validity of all the latent constructs was examined by assessing the value of the AVE for every latent variable. The correlations among the latent variables were compared with the square roots of the AVE to determine the discriminant validity. All the variables have AVE values above 0.5 before further analysis was carried out. Thus, this study has successfully adopted the PLS modelling approach to assess the psychometric characteristics of each latent variable which is illustrated in the conceptual model of this study.

5.5 Limitations

While this study has supported several hypotheses raised between the independent and dependent variables, there are some limitations in this study. Firstly, the population considered in this study were engineering students in polytechnics who take a diploma course to evaluate the performance of lecturers teaching from engineering departments that teach entrepreneurship subjects. Secondly, the study variables focused only on the four main factors found in the generic teaching entrepreneurship model focusing on how to measure the prestige of the teaching of entrepreneurship lecturers. Thirdly, in terms of methodology this study used a quantitative approach.

5.6 Recommendations

The findings of this study have a number of important implications for future practice. Firstly, in entrepreneurship module, lecturer should use interactive teaching and learning approaches. This will enhance active teaching and learning in which activities involve students with minimal supervision by lecturers.

Secondly, on a broader level, research is needed to determine the impact of using technology-based teaching approaches such as the use of social media in learning activities. The use of this technology is in line with the development of technology in the field of current educational system.

Thirdly, further research might expose entrepreneurship lecturers to entrepreneurial activities directly through interactive teaching and learning approaches, such as sharing experiences on social media platforms such as Facebook. This will improve the entrepreneurial mind set among students and lecturers as well as aid the analysis of market for a new product or technology adoption.

Fourthly, entrepreneurial lecturers should act as mentors or facilitators to students. Coaching approach could be used to convey entrepreneurship knowledge to students and to choose the right marketing approach for the introduction of a new product development in the students' final year projects.

Fifthly, implementing the application of technology in teaching and conducting entrepreneurship. For example, the use of mobile applications in promoting the culture

of innovation and creativity among entrepreneurs and generation of new ideas to develop new marketing services using Facebook.

Lastly, entrepreneurial lecturers should actively learn new things related to new teaching methods from other sources such as industrial link and should be involved in activities related to entrepreneurship. Suh activities may contribute towards a better understanding in enhancing the entrepreneurship knowledge among lecturers and students.

5.7 Future Research Directions

Considering the limitations of the present study, some possible recommendations for future research are suggested. Future research should be conducted with the same set of variables but on larger population. For example, the performance comparison of entrepreneurship lecturers in conducting entrepreneurship courses to engineering students among all IPTA's, TVET, (MTUN universities group and community colleges throughout Malaysia). This is because the present study is limited to the lecturers who are obliged to teach the subject of entrepreneurship in 33 polytechnics only.

In addition, this study suggested that a detailed study should be conducted to measure entrepreneurship competencies among entrepreneurs. This study should examine the cognitive process used by entrepreneurship lecturers in identifying entrepreneurial opportunities. Furthermore, future studies should use a "mix method" or triangulation approach to get more meaningful findings in the development of entrepreneurship education model, especially the performance of entrepreneurship teaching. Finally,

this study proposed an action research study using an experimental approach to measure entrepreneurial attitudes and entrepreneurship intentions among lecturers.

5.8 Summary

Online digital entrepreneurs are the implementation of a new government policy that will be implemented continuously in creating job opportunities among graduates. Therefore, it is always necessary to study and make improvements in detail especially in evaluating the performance of entrepreneurship lecturers. The use of online educational technology tool is very important in entrepreneurial assignment because, everything is now going digital and there is need for a positive attitude in the acceptance and execution of such tools. There is therefore, no need to wait for or use outdated techniques because, such outdated techniques are not innovative and do not catch up with the needs of the students which consequently affects teaching. In addition, information management to enhance the excellence of the quality of entrepreneurship education in this competitive globalized world is essential.

In view of the study of performance of entrepreneurship lecturers in the present research, the research data using the students' ratings presents some novel views and insights. Additionally, the findings are as well consistent with previous studies involved in teaching performance studies in the implementation of technological innovation. Factors affecting performance in teaching implementation according to the teaching generic model of entrepreneurship have been studied and analysed. As a result, a conceptual model for assessing the achievement of a successful entrepreneurship lecturer has been generated.

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Appendix A

Study Cover Letter

UNIVERSITI UTARA MALAYSIA

COLLEGE OF BUSINESS
SCHOOL OF TECHNOLOGY MANAGEMENT AND LOGISTICS

ANALYZING THE PERFORMANCE WITH MODERATING EFFECT OF INNOVATIVE WORK BEHAVIOUR AMONG ENTREPRENEURSHIP LECTURER IN POLYTECHNIC

Dear Sir/Madam,

Greeting! My name is MAZITA BINTI MAT ALI and I am a Phd student in the College of Business, Universiti Utara Malaysia. This survey is aims to gather information on your experiences and involvement in entrepreneurship education and activities. The data collected in this survey shall be used purely for academic purposes and will not be disclosed to any other party. Thank you for your kind consideration and cooperation on this matter. For any enquiries, please direct your communication to mazita@polytechnic@gmail.com

Thank you for your time and kind help in advance.

Best regards,

Mazita Binti Mat Ali

: **mazita@polytechnic@gmail.com**

: **013 4171771**

Appendix B

Data collection letter From OYA, UUM

OTHMAN YEOP ABDULLAH
GRADUATE SCHOOL OF BUSINESS
Universiti Utara Malaysia
06010 UUM SINTOK
KEDAH DARUL AMAN
MALAYSIA

UUM
Universiti Utara Malaysia

Tel: 604-928 7118/7119/7130
Faks (fax): 604-928 7160
Laman Web (Web): www.oyagsb.uum.edu.my

KEDAH AMAN MAKMUR • BERSAMA MEMACU TRANSFORMASI

UUM/OYAGSB/K-14
11 March 2015

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER FOR DATA COLLECTION AND RESEARCH WORK

This is to certify that **Mazita Binti Mat Ali (Matric No: 900354)** is a bonafied student of Doctor of Philosophy (PhD), Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia. She is conducting a research entitled ***"Menganalisa Keberkesanan Inovasi di dalam Pendidikan Keusahawanan Melalui Sikap, Kemahiran Teknologi dan Galakan Daripada Kerajaan di Kalangan Pensyarah Politeknik di Malaysia"*** under the supervision of Assoc. Prof. Dr. Amlus bin Ibrahim.

In this regard, I hope that you could kindly provide assistance and cooperation for her to successfully complete the research. All the information gathered will be strictly used for academic purposes only.

Your cooperation and assistance is very much appreciated.

Thank you.

"SCHOLARSHIP, VIRTUE, SERVICE"

Yours faithfully,

ROZITA BINTI RAMLI
Assistant Registrar
for Dean
Othman Yeop Abdullah Graduate School of Business

c.c - Supervisor
- Student's File (900354)

Appendix C

Support letter from the Department of Polytechnics' Headquarters

PUSAT PENYELIDIKAN DAN INOVASI POLITEKNIK
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI
Jabatan Pendidikan Politeknik
Galeria PJH, Aras 3, Jalan P4W
Persiaran Perdana Presint 4, 62100 Putrajaya
Tel : 03-88919228 Fax : 03-88919322
Laman Web : http://politeknik.gov.my

POLITEKNIK
Jabatan Pengajian Politeknik

Ruj. Kami : KPT/JPP/PPP/700-1 Jld. 4(36)
Tarikh : 04 April 2016

MAZITA BINTI MAT ALI
Jabatan Kejuruteraan Mekanikal
Politeknik Sultan Abdul Halim Mu'adzam Shah
06000 Jitra
Kedah Darul Aman

Puan,

KEBENARAN MENJALANKAN PENYELIDIKAN BERTAJUK *"ANALYSING THE IMPACT OF INNOVATION IN ENTREPRENEURSHIP EDUCATION AMONG POLYTECHNIC LECTURER IN MALAYSIA"*

Saya dengan hormatnya merujuk perkara di atas.

2. Sukacita dimaklumkan bahawa pihak kami tiada halangan untuk memberi kebenaran kepada puan untuk menjalankan kebenaran penyelidikan bertajuk ***"Analysing The Impact of Innovation in Entrepreneurship Education Among Polytechnic Lecturer In Malaysia"*** seperti yang dijelaskan dalam cadangan penyelidikan yang disertakan.

3. Sebarang pertanyaan lanjut berkenaan kajian penyelidikan yang akan dijalankan, sila hubungi Ketua Unit Penyelidikan Politeknik yang berkenaan untuk melancarkan lagi pelaksanaan kajian.

4. Untuk peringatan, puan hendaklah mengemukakan senaskah laporan akhir kajian tersebut ke Pusat Penyelidikan dan Inovasi Politeknik (PPIP), Jabatan Pendidikan Politeknik. Dimaklumkan juga bahawa puan, adalah diminta mendapatkan

kebenaran terlebih dahulu daripada PPIP sekiranya sebahagian atau sepenuhnya dapatan penyelidikan tersebut hendak dibentangkan di mana-mana persidangan atau seminar, atau untuk pengumuman di media massa.

Sekian untuk makluman dan tindakan seterusnya, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(DR ABDUL RAHIM BIN AHMAD)
Pengarah
Pusat Penyelidikan dan Inovasi Politeknik
Jabatan Pendidikan Politeknik

s.k:

1. Pengarah
   Politeknik Ungku Omar
2. Pengarah
   Politeknik Sultan Haji Ahmad Shah
3. Pengarah
   Politeknik Sultan Abdul Halim Mu'adzam Shah
4. Pengarah
   Politeknik Kota Bharu
5. Pengarah
   Politeknik Kuching Sarawak
6. Pengarah
   Politeknik Port Dickson

7. Pengarah
Politeknik Kota Kinabalu

8. Pengarah
Politeknik Sultan Salahuddin Abdul Aziz Shah

9. Pengarah
Politeknik Ibrahim Sultan

10. Pengarah
Politeknik Seberang Perai

11. Pengarah
Politeknik Melaka

12. Pengarah
Politeknik Kuala Terengganu

13. Pengarah
Politeknik Sultan Mizan Zainal Abidin

14. Pengarah
Politeknik Merlimau

15. Pengarah
Politeknik Sultan Azlan Shah

16. Pengarah
Politeknik Tuanku Sultanah Bahiyah

17. Pengarah
Politeknik Sultan Idris Shah

18. Pengarah
Politeknik Tuanku Syed Sirajuddin

19. Pengarah
Politeknik Mu'adzam Shah

20. Pengarah
Politeknik Mukah Sarawak

21. Pengarah
Politeknik Balik Pulau

22. Pengarah
Politeknik Jeli Kelantan

23. Pengarah
Politeknik Nilai

24. Pegarah
Politeknik Banting

25. Pengarah
Politeknik Mersing

26. Pengarah
Politeknik Hulu Terengganu

27. Pengarah
Politeknik Sandakan

28. Pengarah
Politeknik Metro Kuala Lumpur

29. Pengarah
Politeknik Metro Kuantan

30. Pengarah
Politeknik Metro Johor Bahru

31. Pengarah
Politeknik Metro Betong

32. Pengarah
Politeknik Metro Tasek Gelugor

33. Pengarah
Politeknik Tun Syed Nasir Syed Ismail

34. Pengarah
Politeknik Besut

Appendix D

Research Questionnaires

SECTION A: DEMOGRAPHIC

Instructions: This section is to gather information about yourself. All the information you given are confidential and will be used only for research purposes. Please TICK [√] appropriate box or WRITE down your answer.

For Section 1: Answer each question.

1. Year of study
   ☐ 2nd year ☐ 3rd year ☐ graduates polytechnic

2. Gender
   [ ] Male [ ] Female

3. Age
   ☐ 18 years ☐ 19 years ☐ 20 years
   ☐ 21years ☐ 22 years ☐ Above 23 years

4. Ethnicity
   ☐ Malay ☐ Chinese ☐ Indian ☐ Others

5. Studied Programme Department
   [ ] Jka [ ] Jke [ ] Jkm [ ] Jtmk [ ] others; verify _____

6. Hours of class entrepreneurship per weeks
   [ ] 1 hour [ ] 2 hour [ ] 3 hour [ ] 4 hour [ ] others

7. Are your parents involved in entrepreneurship?
   [ ] Yes [ ] No

8. Is there anyone in your family (not including your parents) who becomes an entrepreneur?
   [ ] Yes [ ] No

9. How many entrepreneurship program have you involved outside of Polytechnic?
   [ ] None [ ] 1 [ ] 2 [ ] 3 or more

10. Do you have your own business now?
[ ] Yes [ ] No

If the answer is NO, please answer below questions.

I would like to start a business in the next year	[ ] Yes	[ ] No
I would like to start a business in the next 5 years	[ ] Yes	[ ] No
I would like to start a business in the next 10 years	[ ] Yes	[ ] No
I don't have any plan to be in business at this time	[ ] Yes	[ ] No

- END SECTION 1 –

SECTION B1:

Instructions: By using the scale (1=Strongly Disagree to 5=Strongly Agree), please TICK [✓] the number in the box that best indicates your degree of agreement with the respective statements.

Strongly Disagree 1 2 3 4 5 Strongly Agree

My lecturer in entrepreneurship subject used active learning strategies such as:	**1**	**2**	**3**	**4**	**5**
1. Lectures					
2. Invites guest speakers					
3. Case studies					
4. Group Discussions					
My lecturer in entrepreneurship subject …					
Compability					
5. Help me to prepare a business plan to understand the entrepreneurial process.					
6. Had the abilities to connect the taught subject with student actual life.					
Observability					
7. Trained student how to developed skill in using modern multimedia teaching technologies while doing business simulations.					
8. Followed my performance during presentations the assignments.					

SECTION B2:

Instructions: By using the scale (1=Strongly Disagree to 5=Strongly Agree), please TICK [✓] the number in the box that best indicates your degree of agreement with the respective statements.

Strongly Disagree 1 2 3 4 5 Strongly Agree

My lecturer in entrepreneurship subject …	**1**	**2**	**3**	**4**	**5**
Perceived Usefulness					
1. Allowed me to communicate with more people in a short time period using Facebook.					
2. Allowed me to share more entrepreneurial task in a short time period using Facebook.					
3. Makes it easier to establish and maintain learning performance using Facebook.					
4. Generated new ideas to develop new services marketing using Facebook					
Rate your level of agreement with the following statements:					
Perceived ease of use					
5. I became a Facebook member with ease					
6. My interaction with my lecturer in Facebook is clear and understandable					
7. I don't have any problems learning entrepreneurship using Facebook features on my own.					
8. I find it easy to use Facebook features to run entrepreneurship subject assignments					
Observable Result					
9. I can learnt more about how to handling business when using Facebook features.					
10. I can get technical support by email if I have problems using Facebook.					
11. I can connect to Facebook where ever there is Internet connectivity to handle my entrepreneurship simulations learning task.					
12. Facebook is similar to other social networks I use (msn, e-mail, online forums).					

SECTION B3:

Instructions: By using the scale (1=Strongly Disagree to 5=Strongly Agree), please TICK [✓] the number in the box that best indicates your degree of agreement with the respective statements.

Strongly Disagree 1 2 3 4 5 Strongly Agree

My lecturer in entrepreneurship subject ...	1	2	3	4	5
1. Actively learn new things related to new teaching methods from another sources.					
2. Relates the teaching to the professional environment.					
3. Learned as much as can in his/her field.					
4. Know how to learn to improve his/her teaching.					
5. Learn from a variety of means.					
6. Be able to learn proactively.					
7. Capable learning independently.					
8. Always keep up to date knowledge in entrepreneurial field.					
9. Created new ways of doing things.					
10. Applied skill and knowledge of using ICT to actual practice.					
11. Involved any activities related entrepreneurship education					

SECTION B4:

Instructions: By using the scale (1=Strongly Disagree to 5=Strongly Agree), please TICK [✓] the number in the box that best indicates your degree of agreement with the respective statements.

Strongly Disagree 1 2 3 4 5 Strongly Agree

My lecturer in entrepreneurship subject ...	**1**	**2**	**3**	**4**	**5**
1. Shared teaching problems with others to motivated students take interest in their learning process.					
2. Always gives students the freedom to express creativity in carrying out the assignment.					
3. Have the knowledge on how to cooperate with others.					
4. Always tells students about the expected competency to be gained in the subject.					
5. Always allows and encourages the participation of students in every teaching and learning activity.					
6. Capable of maintaining a dynamic interaction with student.					
7. Be able to guided students who are weak in class.					
8. Always help students think critically during lessons.					
9. Convincing students that they can do the exercises or assignments well.					
10. Help students learn effectively.					
11. Submit meaningful questions to students during lessons.					

- END SECTION 2 –

SECTION C:

Instructions: By using the scale (1=Strongly Disagree to 5=Strongly Agree), please TICK [✓] the number in the box that best indicates your degree of agreement with the respective statements.

Strongly Disagree 1 2 3 4 5 Strongly Agree

My entrepreneurship lecturer had a competencies to encouraged me to ...	**1**	**2**	**3**	**4**	**5**
1. Pay attention to issues that are not part of teaching work					
2. Wonder how things can be improved if integrated modern multimedia technology into the teaching practice.					
3. Always search out new working methods, techniques or instruments					
4. Generate original solutions for problems arise					
5. Finding new approaches to execute teaching tasks					
6. Always make important organizational members enthusiastic for innovative ideas					
7. Always attempt to convince people to support an innovative idea					
8. Had introduce innovative ideas into teaching practices					
9. Contributed to the implementation of new ideas					
10. Put effort in the development of new product design or services					

- END SECTION 3 –

SECTION D:

Instructions: By using the scale (1=Strongly Disagree to 5=Strongly Agree), please TICK [✓] the number in the box that best indicates your degree of agreement with the respective statements.

Strongly Disagree 1 2 3 4 5 Strongly Agree

Rate your level of agreement with the following statements:	**1**	**2**	**3**	**4**	**5**
1. Chosen the right marketing approach for the introduction of a new product development in my project final year.					
2. Developed a strategic objective in business plan assignments to enable marketing project					
3. Recognized a good business ideas which can be supported to become a business start-up.					
4. Analysis a market for a new product or technology while doing my assignments.					
5. Developed extensive knowledge in entrepreneurial skills.					
Rate your level of agreement with the following statements:					
6. I am satisfied with my lecturers' performance.					
7. Overall, my lecturers' teaching delivery is easy and well understood by students					
8. My lecturer having a competence in student evaluation, it improve students' confidence in the subject.					
9. My lecturers' communication is interesting to students.					
10. My lecturer always professional in delivering his/her lectures.					
11. I consider entrepreneurship as a desirable career option.					

- END SECTION 4 -

Thank you for participating in this survey. Your contribution to this effort is greatly appreciated. As a friendly reminder before this process ends, please make sure you have answered all questions.

☺☺☺

Do not hesitate to leave any comment or idea to improve your entrepreneurship lecturer's teaching.

Appendix E

Reliability Pilot Test

Case: ELP

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.759	.791	11

Case: ETT

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.865	.873	12

Case: IM

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.860	.871	8

Case: LC

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.871	.875	11

Case: SI

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.887	.890	11

Case: IWB

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.899	.904	10

Appendix F

Independent Sample Test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ETP_mean	Equal variances assumed	1.997	.158	.102	373	.918	.00785	.07662	-.14281	.15851
	Equal variances not assumed			.099	207.306	.922	.00785	.07964	-.14915	.16485
ETT_mean	Equal variances assumed	3.306	.070	.917	373	.359	.06579	.07170	-.07521	.20678
	Equal variances not assumed			.987	273.544	.324	.06579	.06662	-.06537	.19695
IM_mean	Equal variances assumed	2.098	.148	.191	373	.848	.01903	.09950	-.17663	.21468
	Equal variances not assumed			.196	242.572	.845	.01903	.09691	-.17187	.20992
LC_mean	Equal variances assumed	1.054	.305	.135	373	.892	.00993	.07333	-.13425	.15411
	Equal variances not assumed			.130	205.445	.897	.00993	.07651	-.14093	.16078
SI_mean	Equal variances assumed	.167	.683	-.711	373	.478	-.05355	.07534	-.20170	.09459
	Equal variances not assumed			-.711	227.503	.478	-.05355	.07530	-.20193	.09483
IWB_mean	Equal variances assumed	.211	.646	.558	373	.577	.04186	.07500	-.10561	.18933
	Equal variances not assumed			.545	214.777	.586	.04186	.07678	-.10947	.19319

Normality Test

	N	Skewness	Kurtosis
Entrepreneurship lecturer performance	375	-.438	.335
Innovation method	375	-.266	-.202
Educational technology tools	375	-.278	.108
Learning Capabilities	375	-.199	-.308
Social Integration	375	-.369	.070
Innovation Work Behaviour	375	-.443	.730

Descriptive Statistic Variables

	N	Minimum	Maximum	Mean	Std. Deviation
ELP_1	375	1	5	3.9440	.88636
ELP_2	375	1	5	3.9600	.89323
ELP_3	375	1	5	3.9520	.88833
ELP_4	375	1	5	3.9547	.90191
ELP_5	375	1	5	4.0293	.86630
ELP_6	375	1	5	3.9867	.87284
ELP_7	375	1	5	4.0080	.87901
ELP_8	375	1	5	4.0027	.87294
ELP_9	375	1	5	3.8560	1.00030
ELP_10	375	1	5	3.9493	.88668
ELP_11	375	1	5	4.0267	.87407
ETT_1	375	1	5	3.9973	.89412
ETT_2	375	1	5	3.9867	.90886
ETT_3	375	1	5	3.9813	.82227
ETT_4	375	1	5	3.9920	.81263
ETT_5	375	1	5	4.0027	.83538
ETT_6	375	1	5	3.9760	.86646
ETT_7	375	1	5	4.0027	.84175
ETT_8	375	1	5	3.9840	.83683
ETT_9	375	1	5	3.9920	.82244
ETT_10	375	1	5	3.9467	.85739
ETT_11	375	1	5	3.8933	.91589
ETT_12	375	1	5	3.7440	1.08394
IM_1	375	1	5	3.9867	.85113
IM_2	375	1	5	3.9707	.89365
IM_3	375	1	5	3.9627	.89185
IM_4	375	1	5	3.9440	.89834
IM_5	375	1	5	3.9680	.83316
IM_6	375	1	5	3.9787	.83990
IM_7	375	1	5	4.0160	.84002
IM_8	375	1	5	3.9227	.91739
LC_1	375	1	5	4.0213	.82383
LC_2	375	1	5	3.9893	.85587
LC_3	375	1	5	4.0160	.78744
LC_4	375	1	5	4.0133	.79929
LC_5	375	1	5	4.0400	.81824
LC_6	375	1	5	4.0347	.82175
LC_7	375	1	5	4.0240	.86337
LC_8	375	1	5	3.9760	.85716
LC_9	375	1	5	4.0267	.81715

LC_10	375	1	5	3.9413	.88164
LC_11	375	1	5	3.9413	.89966
SI_1	375	1	5	4.0293	.84758
SI_2	375	1	5	3.9813	.83517
SI_3	375	1	5	3.9893	.82403
SI_4	375	1	5	4.0107	.81424
SI_5	375	1	5	4.0027	.80273
SI_6	375	1	5	3.9733	.86484
SI_7	375	1	5	3.9920	.90302
SI_8	375	1	5	3.9680	.89206
SI_9	375	1	5	3.9867	.88803
SI_10	375	1	5	3.9813	.90582
SI_11	375	1	5	3.9307	.88390
IWB_1	375	1	5	3.9760	.84459
IWB_2	375	1	5	3.9840	.80091
IWB_3	375	1	5	3.9173	.87208
IWB_4	375	1	5	3.8720	.92189
IWB_5	375	1	5	3.9360	.82161
IWB_6	375	1	5	3.9440	.83028
IWB_7	375	1	5	3.9173	.85349
IWB_8	375	1	5	3.9147	.87946
IWB_9	375	1	5	3.9253	.88346
IWB_10	375	1	5	3.9680	.83956

Result of Pearson Correlation

Correlations

		MEAN_ELP	MEAN_ETT	MEAN_IM	MEAN_LC	MEAN_SI	MEAN_IWB
Pearson Correlation	MEAN_ELP	1.000	.709	.680	.077	.149	-.058
	MEAN_ETT	.709	1.000	.879	.105	.285	-.011
	MEAN_IM	.680	.879	1.000	.111	.316	-.011
	MEAN_LC	.077	.105	.111	1.000	.379	-.017
	MEAN_SI	.149	.285	.316	.379	1.000	.016
	MEAN_IWB	-.058	-.011	-.011	-.017	.016	1.000
Sig. (1-tailed)	MEAN_ELP	.	.000	.000	.069	.002	.132
	MEAN_ETT	.000	.	.000	.021	.000	.413
	MEAN_IM	.000	.000	.	.016	.000	.416
	MEAN_LC	.069	.021	.016	.	.000	.369
	MEAN_SI	.002	.000	.000	.000	.	.381
	MEAN_IWB	.132	.413	.416	.369	.381	.
N	MEAN_ELP	375	375	375	375	375	375
	MEAN_ETT	375	375	375	375	375	375
	MEAN_IM	375	375	375	375	375	375
	MEAN_LC	375	375	375	375	375	375
	MEAN_SI	375	375	375	375	375	375
	MEAN_IWB	375	375	375	375	375	375

Collinearity Statistic Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.180	.260		4.540	.000		
MEAN_ETT	.524	.080	.491	6.520	.000	0.253	3.953
MEAN_IM	.290	.081	.272	3.569	.000	0.248	4.028
MEAN_LC	.028	.041	.027	.690	.4900	0.855	1.169
MEAN_SI	-.088	.041	-.087	2.131	.034	0.779	1.283
MEAN_IWB	-.048	.037	.047	1.319	.188	0.999	1.001

Appendix G

OUTPUT SMART PLS

R Square

Variables	R Square
ELP	0.485

R Square Adjusted

Variables	R Square Adjusted
ELP	0.472

Latent variables correlations

Variables	ELP	ETT	IM	IWB	LC	SI
ELP	**0.773**					
ETT	0.676	**0.801**				
IM	0.614	0.811	**0.823**			
IWB	0.086	-0.037	-0.015	**0.778**		
LC	0.094	0.128	0.109	-0.018	**0.782**	
SI	0.158	0.302	0.303	-0.004	0.380	**0.787**

Cronbach's Alpha

Variables	Cronbach's Alpha
ELP	0.94
ETT	0.93
IM	0.89
IWB	0.93
LC	0.94
SI	0.94

Composite Reliability

Variables	Composite Reliability
ELP	0.94
ETT	0.93
IM	0.89
IWB	0.93
LC	0.94
SI	0.94

AVE

Variables	AVE
ELP	0.598
ETT	0.641
IM	0.677
IWB	0.605
LC	0.612
SI	0.620

Path Coefficients (Mean, STDEV, T-Values, P-Values)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ETT→ ELP	0.527	0.524	0.070	7.543	0.000
IM → ELP	0.207	0.205	0.071	2.922	0.001
IWB→ ELP	0.3107	0.316	0.080	3.867	0.000
LC → ELP	0.026	0.038	0.051	0.509	0.611
Moderating Effect IWB* IM → ELP	-0.353	-0.350	0.068	3.518	0.001
Moderating Effect IWB *LC→ ELP	0.032	0.029	0.044	0.717	0.474
Moderating Effect IWB *SI → ELP	0.086	0.077	0.044	1.966	0.001
Moderating Effect IWB* ETT→ ELP	0.369	0.362	0.065	3.564	0.001
SI → ELP	0.068	0.068	0.038	1.980	0.001