

## An Assessment of a University-Industry Partnership in a Malaysian University

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### Abstract

*The university-industry engagement serves as a cooperation that gives benefit to both parties. The universities and the industries are dependent on each other as the university's role is to produce human capitals to work at the industries, and the industries on the other hand need human capitals to run their business. However this kind of dependency could raise issues that cause difficulties for both parties if the relationship is not checked and balanced from time to time. The universities should be aware of the industries' changing needs as time changes. Hence the programmes that they offer to their students should take into consideration the industries' needs. This research was to identify the current practices of the university-industry engagement, to appraise the factors contributing to the effectiveness of the university-industry engagement involving UMP and the identified industries, to map the prospects and challenges that UMP faces in the university-industry engagement and to propose the best approaches that the university could engage to provide high class human capitals to work at the industries. This research employed a survey in the form of interviews and expert group discussions. The results show that there is still a mismatch in the university-industry engagement. This paper discusses the mismatch in the university-industry engagement.*

**Key Words:** university-industry engagement, human capital.

### Introduction

The university-industry engagement serves as a cooperation that gives benefit to both parties. The universities and the industries are dependent on each other as the university's role is to produce human capitals to work at the industries, and the industries on the other hand need human capitals to run their business. However this kind of dependency could raise issues that cause difficulties for both parties if the relationship is not checked from time to time. The universities should be aware of the industries' changing needs as time changes. Hence the programmes that they offer to their students should take into consideration the industries' needs. The industries on the other hand should inform the universities of their expectations from the human capitals working with them.

Aronowitz (2000) and Bok (2003) both could see that the university-industry dependency should compromise on the quality of education offered by the universities. Lee Mei Ph'ng, et al (2008:80) who studied on the university-community engagement in Malaysia found that the activities in this engagement are managed in such a way that the boundary between the universities and the community is categorised as fuzzy. It was also found that this fuzzy boundary is not caused by the design but the approaches. Hence the activities could have better prospects if the approaches applied are more systematic. The finding from this research has caused the concern for the start of this research. There are many industries at the East Coast Peninsula Malaysia that have direct links with the universities nearby. The Petrochemical industries, automotive industries, and oil and gas industries are directly involved with University Malaysia Pahang in the university-industry engagement. It is the concern of this research to identify the current practices of the university-industry engagement and to propose the best approaches that the university could engage to provide high class human capitals to work at the industries.

### Research Objectives

It was the concern of this research to identify the current practices of the university-industry engagement and to propose the best approaches that the university could engage to provide high class human capitals to work at the industries. In order to do so it is important to identify the standards that the industries expect from the university's graduates. Hence it was the concern of this research to investigate the current practices that the industries in Malaysia apply, and whether the practices synchronise with the curriculum in the university. The conduct of this research was based on the research objectives given below.

- a. To survey the current practice of the university-industry engagement involving University Malaysia Pahang (UMP) and the identified industries

- b. To appraise the factors contributing to the effectiveness of the university-industry engagement involving UMP and the identified industries.
- c. To map the prospects and challenges that UMP faces in the university-industry engagement
- d. To propose to UMP the best approach that leads to the production of the best human capital resources for the identified industries.

### ***Research Questions***

The following research questions were formulated based on the research objectives above:

- a. What is the current practice of the university-industry engagement involving UMP and the identified industries?
- b. What are the factors contributing to the effectiveness of the university-industry engagement involving UMP and the identified industries?
- c. What are the prospects and challenges that UMP faces in the university-industry engagement?
- d. What is the best approach for UMP that leads to the production of the best human capital resources for the identified industries?

### ***Significance of the Study***

The findings from the present research give us an overview of the current practices of the university-industry collaboration, especially involving Universiti Malaysia Pahang. Factors involving the effectiveness of the U-I collaboration were identified and are given in the conclusion and recommendation section in Chapter Five of this research report. It is hoped that the recommendation given would be able to provide some guidelines for the university to come out with the best approach that could lead to the production of the best human capital resources to work at the industries.

### ***Literature Review***

University-Industry collaboration (U-I collaboration) has started as early as 1950 in China. Developed countries are more advanced in the university-industry relationship than the developing countries. The university-industry engagement in developing countries is described as still in “splendid isolation”. The reasons for this isolation are lack of funds, lack of industrial experience, and lack of awareness amongst academicians (Siti Hamisah Tapsir, et al., 2008:92). The fast growth of university-industry relationship in Britain in the 1980s was due to budget tightening of universities under the Thatcher government (Sachi Hatakenaka, 2004). The smart partnership between university and industry is absolutely important. In Malaysia the U-I partnership has emerged since mid 1980s (Siti Hamisah Tapsir, et al, 2008:94).

Moshe Vigdor, et al (2000) conducted a research to collect empirical evidence on innovative mechanisms through the world wide relationships between universities and industries. Five different universities from Africa, Europe, Latin America and Pacific Region were observed in the research. These universities were chosen not only because of their innovative approaches in the management of their university-industry linkages but also because they represent a wide range of development contexts, such as a western industrialised country, middle-income countries, and a low-income country. These universities also represent different academic traditions.

Sachi Hatakenaka (2004) focused on the university-industry relationships in three universities: University of Tokyo in Japan, University of Cambridge in the United Kingdom, and Massachusetts Institute of Technology in the United States. Her qualitative analyses of these universities showed that the university-industry relationship in the University of Tokyo was impermeable, whereas in the University of Cambridge was fuzzy. The University of Tokyo was the first university to be established in Japan to help the country catch up with the west (pg. 11). The University of Cambridge was reported by Sachi Hatakenaka to be as the first U-I collaboration example in the United Kingdom to create a science park to foster linkages with industry, The Massachusetts Institute of Technology was different because it was described as porous. Sachi Hatakenaka reported that Massachusetts Institute of Technology was the first U-I collaboration in the United States, and possibly in the world. To establish an individual liaison programme, member companies were given special help in linking to faculty members with relevant research experience. The term university-industry engagement covers broad categories. The categories are the linkage of mechanisms, for example pertaining to teaching and research activities as in consultancy, teaching and curriculum development, research and development activities, mutual visits, jointly organised meetings, conferences, seminars, joint publications, joint exhibitions, fairs, etc. (Moshe Vigdor, et al, 2000:14).

The United States of America sees university-industry engagement in a broader form of formal and informal linkages, such as contract research, research parks, industrial R&D consortia, industry-university research centres, faculty consulting, student job placement, and student internships (Meagher, 2002:3). Meanwhile, Uganda has traditionally practised that every student pursuing a degree in engineering discipline must undergo a specified period of industrial training in a recognised industrial establishment (Moshe Vigdor, 2000:235).

Issues about university-industry relations emerged in line with the discussion on reforming higher education systems and institutions as a strategy to improve the relevance of their teaching and research activities (Moshe Vigdor, et al, 2000:13). The most common issues pertaining to university-industry engagement are secrecy of research results and findings, intellectual property rights, and funding. Sachi Hatakenaka, (2004) stated that there are also issues of accountability and relevance of science-industry relationships apart from funding. Moshe Vigdor (2000:56) found that the most complicated issues in the university-industry engagement were those related to publications, possible conflict of interest of researchers, and the patenting of intellectual property.

Lee Mei Ph'ng, et al (2008:80) who studied on the university-community engagement in Malaysia found that the activities in this engagement were managed in such a way that the boundary between the universities and the community was categorised as fuzzy. It was also found that this fuzzy boundary was not caused by the design but the approaches. Sachi Hatakenaka, (2004) saw a positive development in university-industry engagement due to fuzziness because she found that the fuzzy organisation and boundaries for boundary crossing that involved people, knowledge, physical space in Cambridge has caused and allowed development of variety of deep relationships between university academics and the industrialists. She postulated that fuzziness in people boundary made it possible for academicians and industrialists to see the world on the other side of the boundary thus enables better mutual understanding in relationships. Apart from that the difficulties that academicians encountered in crossing internal boundaries in the university has caused the academicians to build closer tie with the industries.

Both universities and industries, which are involved in the university-industry engagement, are able to gain benefits, either in the short run or long run. A major outcome of this engagement is the introduction of new products and processes and the improvement of products and processes that already exists (Cohen, Florida and Goe, 1994 as quoted by Meagher, 2002:7).

Moshe Vigdor, et al (2000:27-28) purported that successful management of university-industry relations should be based on a strategic management approach to make the development of such relations to declare university-wide, long-term development objective. Apart from that the policy concerned needs to be backed up by top management. Other than that activities should be coordinated, university-wide rules should be designed and synergies created. Moshe Vigdor, et al. (2007) also professed that critical successful factors are not only determined by a balance between centralisation and decentralisation in the universities, but also autonomy linked with checks and balances.

Aronowitz (2000) and Bok (2003) could both see that the university-industry dependency should compromise on the quality of education offered by the universities. Hence the activities could have better prospects if the approaches applied are more systematic. New partnership might become organisational template for replication in future initiatives (Sachi Hatakenaka, 2004).

As referred to the studied case which is University Malaysia Pahang, the curriculum taught in University Malaysia Pahang (UMP) is based on engineering, technology and creativity. The students in this university are trained to become engineers in various industries. Before the students graduate they are sent to various industries for their six month industrial training during their final semester. For that purpose UMP has close link with various industries all over the country, especially in the East Coast Peninsula such as the petrochemical industries, automotive industries, and oil and gas industries. This close linkage is termed as university-industry collaboration.

The university-industry collaboration engaged by UMP is not only for the purpose of sending students for the industrial training, but also for other purposes such as research, consultation, commercialisation, entrepreneurial and technical services. For that purpose the University Industry Centre (UIC) in UMP, which is under the office of the Deputy Vice-Chancellor (Research & Innovation) was officially established in the year 2006. The objective of the establishment is to enhance a university-industry partnership by efficiently and systematically managing the university's relationships with the industry in the realms of consultancy, commercialisation, entrepreneurship and technical service.

The long term reasons for the establishment of UIC are: to act as a platform for the researchers in UMP to commercialise potential products of research; to attract people in the industries in Malaysia and overseas to collaborate in the commercialisation of technology and innovation by the UMP members; to become the platform for small entrepreneurs to start their businesses and to become the platform for UMP members to make money through deliberation of projects, commercialisation of new product, rents and service charges. The UIC assists the university in generating revenue through consultancy and technical services while providing the basic infrastructure for the development of the university's technology park through the creation of the incubator centre. The UIC also ensures proper dissemination of relevant information to facilitate technology transfer by developing and maintaining a database on industries, experts and the fields of expertises that can be used as a reliable source of reference by researchers and entrepreneurs.

### **Research Design**

This research employed two research designs: a multiple case studies, which took into consideration the suggestions given by Yin (1989) and a survey as described by Wiersma (1991:170-178) and Best and Kahn, (1993:231-242). Yin (1989:52) professed that the “evidence from multiple cases is often considered more compelling and the overall study is therefore regarded as being more robust”. Two different methods of obtaining data were engaged to facilitate triangulation. The methods of obtaining data involved the following instruments:

- a. Interviews
- b. Discussions with identified focus groups

A few interview sessions were conducted to obtain data for this research. A structured form of interview questions was formulated to interview representatives from the industries and the universities. An expert group discussion, a seminar and a conference were also organised to collect data. During these meetings representatives from the university and the industries were invited to have an open discussion. The data obtained from this research were qualitative data in the form of transcribed and recorded interviews and discussions. The data were transcribed manually and analysed descriptively.

### **Results and Discussion**

This section presents the results of the interviews and discussions with identified focus groups.

#### **Interviews**

A university staff from an Australian university was interviewed when she visited Malaysia in 2008. According to her the universities are no longer considered as isolated ivory towers, but are centres of national and international labours. The global environment for universities is charity. In the university, everybody is working without endless, but with high pressure and the tense situation. This is because there is increasing number of pressures on the universities. They have the symptoms of many policies and needs at national and international level. There are potential for example in public policy. The big pressure in many areas is how well thus a university ranks. Once upon a time universities were just to educate people, but now the pressure that universities is facing is to prepare people to work. This is a different pressure for pressures on contributing to local development, for example University of Malaysia Sabah has to contribute to local area. The other pressure on universities relates to the fact that the government is a different department. Amongst all of the best creatures, the university has to go out into the community, and must perform well at local regional, national and international terms.

Universities are not like schools, businesses and research repertoires. Universities are unique. They must focus on the research, teaching and learning, what the major work we have to do today is be a university within the community and engage with the community. Being part of community is business through university. Universities should become knowledge transfer organisations that do not only focus on research and teaching, but also on engagement with the industry. Business is part of a community no matter manufacturers or tourists, they are all business activities. In Sabah tourist management is strong. Industry should know that universities have to be linked to all businesses in the industries and the government. What has become evidence in recent years is that the notion of the third way has become very important. The third way means that universities must teach, research and engage with the community. The emphasis in the notion of the third way for the university is not just giving information to the community but also receiving. Universities are kinds of knowledge transfer organisations. University and community are partnership because they correlate with each other by a two-way process like an interaction between universities itself and the communities as universities work for the community and gain something from the community.

The criteria are really important. If it is good enough it would make a benchmark to follow. So, all community engagement should be holistic and comprehensive. It should involve comprehensive community engagement, students, research joined partnerships and so on. We need to say that this is part of their plan. What is important when university is involved at community engagement is that they have to be sure that they can do this. The next criterion is commitment. One university might be a big statement and good links with the international organisations. The important things are building a good partnership and make sure it is going well and is doing what we want to.

If we want to be a top university we have to do something about it. University is now one of the major employers for education is a major industry. So, university should always be very important for the region. The community, business and the other parts of the region should provided assistants to the university as scholarships, research fund. The government industry partnerships are probably the strongest aspect of getting universities on the town for well organized, well structured and well community engagement. So, faculty has to be done properly during the community engagement. Within those criteria, it should be a benefit to the university, to the staff, students and the community.

The challenges that we face maybe when the university was small hidden, a closed system is not so complete and it is better for the university to join the community and become much more risky to be part of community. It is the central but it is risky because of its system. It's also important to partnerships contribute to the regional development. And on the other hand, university must listen to business, community organisations, the community and the government at local state and federal level, because universities are open system and valuable in the worldwide and must remain committee to good learning. So much more, it can be concluded that the idea how we can get the focus on innovations. Innovations do not just mean the technical device innovations but soft skill innovation, human innovation as well. It is in the lines between a world class research intensive university and the community. By this means the university gains and the community gains with full appropriate environmental, cultural, and social advertise. Finally, here is to emphasise that innovation campus will meet all of the criteria benefiting university, but also businesses and the community. In this kind of way the universities can be part of the innovation in the long term.

The problem as we known in Malaysia is always emphasising in processes. But government will never be totally independent in the way; the raw of university business partnerships is one part of the strategy. It needs to be in the notions. No matter what happens, universities must retire the uniqueness. Another thing is to develop the society; the society needs the social sciences in humanity. Students needs and by encouraging everybody to understand history, politics, international relations and languages. University should do as well as we can do.

An executive personnel from a gas and petroleum industry in Malaysia was also interviewed. He mentioned that his industry was a branch that has 500 employees. This is one of the active industry involve in industrial training by trainees around the world such as from U.S., Canada, UK, Australia, New Zealand. Trainees are normally students who are sponsored and first priority comes from the university that this industry owns. However, industrial training is also offered to students from other local universities and overseas graduates. During industrial training, trainees are given RM500 per month as allowance. Their industry has a structured programme for industrial training. Trainees are assigned to projects that they need to complete within the time limit given for industrial training. Industrial training is a win-win situation for the industry, the university, and the students. The industry wins because work is done and the students win because they gain experience.

From his opinion; firstly, universities should be fore-runners in everything by added values to accommodate the industries and the country. Benefits should be tangible. Universities should produce established figures like Ungku Aziz so that people believe and have confidence in the universities' product. Physical evidence should be shown before marketing is done. The course syllabus in the universities should comply with the requirements needed in the future careers that the students are going to undertake. Students should be equipped with an overall knowledge that includes not only technical knowledge but also soft skills that enable them to be good leaders, good communicators, and good organisers. A good worker also should be able to articulate ideas, solve problems, and work in a team. When asked about staff mobility, he said if university staffs want to work at the industries, there should be clear cut criteria. Another executive personnel from a petrochemical industry was also interviewed. According to him, the most challenging period in managing the plant was in the first 100 months of Plant Operation. It was a very difficult period for all personnel throughout the plant. The system need to be established on the firm ground, and the operation has to meet the design and standard as specified.

Thus, it required concerted effort from every quarter in the organisation, working towards good manufacturing practice (GMP) and optimise plant production and quality programs. He agreed that industries should have good rapport with the universities for the following reasons:

1. Universities provide good facilities.
2. The courses in the universities are related to the industries
3. Universities in Malaysia are Government Support Institutions
4. Collaboration gives benefit to both parties.

An executive personnel from a car production plant was interviewed and he focused on University-Industry engagement in Malaysia and Germany. He viewed his own opinions about trainees and also working in Malaysia. According to him there is a gap between the schools and the industries in Malaysia. Universities should bring their system close to reality. The universities should invite people from the industries to teach the students, especially on the practical side. As compared to Germany, moderation meetings are always conducted to make sure that the U-I engagement is running smoothly. Industries also are invited to go to universities for seminars, etc.

In universities especially, the education is very good but just theoretically. Practically students cannot adapt themselves to work at the industries. They experience practical shock when they first arrive at the industries for training. There exist a lot of misunderstanding and miscommunication. Students should bring their daily knowledge to the real environment. They should be hungry to gain knowledge. Students should learn how to adjust themselves to the working environment. From his experience, working in Malaysia is better than working in many other countries like Brazil. He feels safe walking in the streets in Malaysia. In Brazil he does not feel safe walking around with his precious belongings like watch and ring. He has to give money to the beggars at the roadside but not to show off that he has lot of money, fearing that he might be robbed.

### **Expert Group Discussions**

Several issues raised during a discussion held with a group of executive staff of a car producing company. The Chief Executive Officer complained that his advice was never requested by the university, even though he was one of the advisory board for the university. He had no role at all in the advisory board. He also found that university students were not passionate about any type of engineering. Their main concern was just to get any job as long as they got paid, even though the job was not related to their field. The university students were not focused because they were not able to specialise in any field that they should be good at. University students were too eager to graduate as early as possible. This would affect the quality of graduates. At the universities the students could repeat if they failed, but at the industries workers were normally terminated if they failed. The students knew the theory and the basics only. When they came to the industries for their training, the industries had to teach them from the beginning.

There is still a mismatch between the universities' and the industries' working styles. The university staffs are not willing to work extra hours whereas the industry staffs have to work until late nights and also during weekends. It is normal for the industry staff to work without proper night sleeps if anything goes wrong and repairs are needed. Creating bureaucracy will cause hurdles for the university-industry engagement. Bureaucracy and working cultures at the universities and the industries are different. Bureaucracy can cause delay in work and the industries cannot wait for long to complete any work. Lengthening of work duration can cause industry staffs to lose their jobs.

There was a complaint about students work ability. The university graduates were not ready to work directly in industries. The students seemed to be hopeless. When they came to the industries for their training, the industries need to facilitate students from the beginning when they start their industrial training. University students went for industrial training at a certain industry, but they applied to work at a different one after they completed their studies in the universities. The industries spend money to train the students during the industrial training. Hence it is a waste of the government's money to train such students who opt for different types of jobs. There is no effective understanding between university and industries as partners. The universities invite the industries for functions like dinners, but the functions do not provide any platform for them to discuss matters pertaining to university-industry engagement. The universities do not give the chance for the industries to give real feedback about students' performance. The lecturers came to the industries just to see their students but did not make any effort to see the staff from the industries.

The group of executive from the company suggested the universities should go to the industries to find out the requirements needed to work at industries. At the same time university students who go for industrial training should go back to their universities and reflect what they have learnt in the industries. To ensure that students are passionate about their jobs, the universities should guide the students so that they are more focused and know what type of engineering that is suitable for them. The students cannot just choose any type of engineering without knowing whether it is suitable for them or not. There should also be a proper channel for the industries to report about the students' performance.

The universities and the industries are working in two different environments. Both the universities and the industries have not been in each other's world. Hence both parties are criticising each other. To build a good relationship between the two organisations, there should be a hybrid relationship. There should be a free flow of people from the universities to the industries and vice versa. If anyone is interested to find out about availability of jobs at the industries, he/she should approach the CEO who knows best about it to discuss the details.

Workers should be internally driven to be motivated. People in Malaysia are not so passionate about their work as compared to Thailand. It is very tough to get people to love their jobs in Malaysia. At the universities the staffs are not willing to work extra hours, whereas at the industries the staffs have experienced working for three days without proper sleep to complete certain task. Industry cannot afford to waste a single second of their time. Thousands of ringgit could be lost if any task is delayed. This provides motivation for the industry staff to work day and night to complete a task. University-industry engagement is expected as a way to increase the motivation and work passion of students.

The industries' only means of communication with the universities is the log-book. There is no proper channel for the industries to report about the university students' performance during their industrial training. Besides, there has been a communication barrier between the industry staff and the university students because the students could not communicate well. The growth of industries in a region requires support from the community to fulfil their needs. Industries require many engineers and workers who can be supplied by local universities. Different industries require different object and different students from different faculties. Due to the uniqueness of each type of industries, the university should make engagement to the industries to identify the real thing that they need from university. Human capital development must be emphasised in develop a region, because before we build a plant, we must build people first.

Industries require the university's graduates with adequate qualification. The knowledge is not enough, they must have vision. Student must be competitive not only in Malaysia but also world-wide. After all, the qualification of students should meet the industry needs. In order to obtain the expected qualification of students, some factory can facilitate the student to do some on hand training in their facilities, but the factory cannot offer the students to use full facilities because some limitation and restriction. The engagement between University and industries expected to improve the competitiveness of stakeholders.

There is a misleading perception that research and development (R & D) activity is something that spent money and dumped it into the black hole. To change the perception into a positive think, research should follow with industries standards and it has a value for the corporate. Thus, the result can be applied in industries, and both industry and university can gain more benefit from it. Absolutely, the university must have the adequate technology mastery to do that kind of research.

Industries required research that can help them to solve their actual problems quickly. Industries need solution for their problems, not only the profit. The industry has a limited manpower and expertise to solve its own problems. That is the university can play its role to help industries because the university has many expert in many fields. An effective university-industries engagement can easily identify the problems in industries that can be solved by research in university that will be carried out by lecturers and/or graduate students. The university can be a partner for industrial problem solving. Stakeholders will be able to facilitate if the university ask to approach the collaboration in industrial-based research. The engagement includes sending people from industries to be involved in the program. It will be important to arrange the further meeting; it could be an informal meeting, to raise more ideas in university-industry collaboration. There were several other issues raised during another expert group discussion. The first important topic was about the period for the industry engagement for university students. Most experts suggested that for small industries, three months were enough. However, for big industries the minimum period should be six months as the students had to learn several processes.

Within six months students could be more familiar with the production process and technology. Moreover, they could improve their communication skills; learn how to work with other people and how to be self-motivated. Industrial engagement is the communication between students and industry. Therefore, universities should determine the scope of teaching and find the proposal or project for students to know what can be done during the industrial engagement. This scope should not only be research problem, but also related to production process. Universities should encourage the students to develop new production technologies which can save more money, can be more competitive and can be exported. The major efforts should be focused on the main fields for the development of Pahang state in the future, such as electric cars, fuel save technologies and “green technology”. For this purpose students require enough period of time.

One of the participants of this discussion mentioned that Malaysia could not compete with European countries, however, it could compete with Thailand, Indonesia and other Asian countries. Therefore, both the university and industry have to look for own niches of production processes. Moreover, as another participant added, in this particular case, it is necessary to take into consideration the needs of the government and the expectations of both the university and industry. Another significant issue that have been discussed during this discussion was about complains from the industries that the students were not knowledgeable enough. As experts from the industry mentioned, it was not fair to consider that the students had low level of knowledge. For example, a participant noted that there were two systems of education. One of them prepare mechatonic person who can operate machines only. Another system prepare engineer with a broad knowledge space who can design process, this person is more than mechatonic. The university should provide the students with fundamental knowledge and teach them how to be innovative and creative. At the same time, it was recommended to show them the real industrial world in advance to make the students be familiar with the area that they are going to choose. It is very important as the industrial environment is different from the university laboratory. With these skills after graduation the students will be able to adapt to the industrial environment.

Moreover, it was suggested to design and to plan everything for students in advance. Experts from the industries should participate in students training process in universities. It is also better to assign the supervisors for students from the industries. The supervisors should require writing the final report from the students at the end of their industrial engagement. According to the recommendations of the representatives from the industrial sector, the lecturers from the universities should be engaged in industry and have some industrial experience. One more problem that has been suggested to be discussed was the problem of early graduation of the students. Most of the experts from industry agreed that four years were enough. However, the students should study very focused. Students cannot be always with their books and theory. During this meeting there were also several opinions on the statement that universities were not business friendly. For instance, one of the representatives from the industry, indicated that this statement was not true. New knowledge can be applied in business. A participant noted that industrial sector included managers who focused on making money, and the universities were focused on teaching and research. If the university brings new ideas, projects, it can collaborate with industry and can be financially supported by industry. At the same time, one participant suggested that for better collaboration between university and industry it was extremely important to organise the regular workshops.

Important points of view were noted on the topic that industry spends money for students training but they apply to work at a different type of industry. One of them was that the industries should create better environment, so that many people would go there. Some of the experts from industries suggested that the industries had to sign the contracts with the students at least for three years. However, others indicated that in this case the social responsibility in front of the government is important. Students themselves should feel this. In any way, they will apply their knowledge for the development of Pahang. Another statement that people in Malaysia are not so passionate about the work has also been discussed during this meeting. In this case, a participant noted that this statement was opinion of the foreign partners. At the same time, another participant indicated that it was very a subjective matter. There are plenty of works in Malaysia. People can choose and change their work at any time. Reasons can be different, for example, better work environment, higher salary, and shorter working days. Pahang is very big state and have a lot of sectors for employment.

Next issue that has been considered was about graduates’ employment. According to the suggestions from the industrial experts, it is not the responsibility of the university to place the students. If the university offers a number of places for students, these students will be relaxed and cannot be creative and independent. However, if the students themselves find a job, they will be more responsible.



From the results of this discussion it can be concluded that collaboration between the university and industry is very important for both sides. University and industrial sector should work together on product development and process design paying attention to the new, environmentally friendly technologies. During this workshop, several recommendations for more effective collaboration between university academicians and industrial companies have been suggested from the university-industry experts group. Industrial engagement is vitally important for university students and should be, in case of big industries, not less than six months. Both university lecturers and experts from industries have to be involved in this process. Industry should create better working environment for graduates to attract them. Malaysia has various industrial sectors that mean a plenty of opportunities for business activities. University, being higher educational organisation, should focus not only on research activities, but also on application of research outcomes in practice. To achieve this goal, it is vitally important to organise university-industry workshops on the regular basis.

### ***Discussion***

The descriptions of the university-industry partnerships in various countries show that the collaboration is impermeable as in the University of Tokyo, fuzzy as in the University of Cambridge, and porous as in the Massachusetts Institute of Technology. If partnerships between universities and industries were to be successful, they should change from impermeable to permeable and from fuzzy to porous. This means that both parties should consider having policies, rules and regulations to regulate matters pertaining to the relationships, so that activities run smoothly. Some government or research funding agencies have issued guidelines, codes of practice or set of principles to supplement laws or provide guidance to institutions on the exploitation of IP rights. The aim of such guidelines is generally to ensure that universities have access to information on best practices in the identification, protection and management of IP rights (Risaburo Nezu, 2005:40). The results of the interviews, the dialogue and the expert group discussion show that representatives from the industries would very much like to be actively involved in the activities organised by the universities. They are even willing to teach the university students if given the chance to do so. The representatives also showed keen interest to take part in the preparation of the teaching syllabus, so that the students are able to work in the industries better. The representatives from the universities showed their interest to go for the third way that is a good rapport with the industries. Before this the first way was teaching and the second way was research. These positive responses from both the universities and the industries provide a good platform for both parties to go for a better form of university-industry collaboration.

### ***Conclusion and Recommendation***

A number of surveys have given us some insight about the problems pertaining issues related to the university-industry engagement. The East Coast industrial area had shown us that a wide gap still exists between the universities and the industries even though a lot of effort had been worked out for a better relationship between the two. It is more of a practical matter rather than theoretical that deepened the gap of cooperation. However, the positive signs had clearly shown that both parties are willing to find ways to solve differences in order to make the engagement more meaningful. The main obstacle in achieving this is time as it dictates the business value. But, by giving more priority on the matter, the issue can be address in the best possible manner.

There are several issues been addressed in the university-industry engagement

1. Preparing students for industrial training.
2. Industrial training for students needs some form of revision.
3. University staff needs to undergo industrial internship.
4. There should be ongoing research projects between the universities and the industries.
5. Supervision for post graduate students should involve qualified industry players.
6. Should include more industrial people in the curriculum revising team.

A closer tie between universities and industries will enhance more project development. The closer tie will help the universities to encroach more funds from outside, and not just relying solely on the government. There will be a better utilisation of universities' equipment for technical services if a good rapport between universities and industries prevails. The East Coast sampling in this research is not thorough enough to see the overall views on university-industry matters. Thus, it is recommended to get more samples throughout the country, especially where the Malaysian industries begin, that is the Klang Valley. Sampling also needs to be taken across major (if not all) industries. In our research, we were only addressing the petrochemical and automotive industry that is currently the economic drive in the East coast. It is recommended that a further research on university-industry partnerships focuses on other parts of the country and also to compare with another country such as Australia.

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