

The Effect of Education Condition for the University-Industry Collaboration: A Case Study of Faculty Mechanical Engineering in UMP

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Abstract

University-Industry collaboration plays an important role with the development of technology. The education condition is one of the most important affection for the foundation of the collaboration. In this paper 100 students from Faculty of Mechanical Engineering in UMP were investigated with 15 questionnaires for the case study. All the students were also interviewed based on the education condition in UMP. The results were used to investigate the opportunity of founding the collaboration between UMP and industries. The result showed that the education condition in UMP was quite good, most of the students give position recommends. This is the basis for the university-industry collaboration. It will be helpful for the foundation of collaboration in the future.

Key words: Education; UMP; Collaboration; Industry

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INTRODUCTION

Industrial partners can provide access to valuable data^[1]. They also can provide a reality check on any assumptions made by researchers. Working with industrial partners can help students build valuable professional skills.

Developing working relationships with industrial partners can greatly facilitate job placement for students. These relationships can be especially valuable in

providing attractive jobs for all students when they graduate, not just the “star” students who achieve greater visibility through conferences and publications.

Large-scale collaborations with industry, and with governmental entities or foundations, present a large range of benefits and potential risks to campus, and are likely to become an increasing source of research support in coming decades. The principal risk presented by such collaborations involves displacement of the public-interested research and teaching mission of the University. But this risk, we believe, can be managed through transparent, faculty-led governance; with clear triggers for and criteria guiding Senate review; our standard practices regarding academic personnel decisions; academically rigorous grant-making processes; strict adherence to principles of academic freedom and non-discrimination; and intellectual property models that promote the University’s fundamental interest in the public dissemination of knowledge.

Some Asian universities suffer greatly from the lack of trained individuals who are capable of handling the complex and multidisciplinary work associated with U-I collaboration^[2]. Asian universities in other countries are now running programs to train young engineering and science students, but the programs are far too inadequate. In India, a general course on technology transfer is being taught at management schools, but as students do not have adequate engineering background, it tends to fall short of expectations. The Philippines has become more and more aware of the importance of highly trained manpower. One of the major activities that were initiated is the offering of the first Management of Technology graduate course at the University of Philippine-Technology Management Center since 1994. Some natural science universities in China have degree programs on management of IP. In addition to formal courses at universities, One problem is that those who should take such courses, the middle level managers with ten or more years of working experience,

are too busy to leave their jobs for an extended period of time. The maximum time duration would probably be two to three weeks.

Since Recognizing that R&D activities carried out in universities play an important role in driving firm-level innovations, the Malaysian government implemented explicit policies since the early 1990s to stimulate university-industry R&D linkages^[3]. Consequently, creating multiple channels of information on the R&D activities of the universities is important for firms to realize the benefits and to establish linkages with them. Universities' technology transfer units in Malaysia should play a proactive role in creating access to the channels of information on university's innovative activities. The significant results of these variables demonstrate that universities should formulate strategies that take cognizance of firms' demands when seeking to establish and strengthen R&D collaboration.

While the academic research environment can be quite unstructured, encouraging creativity, working with industry can provide additional structure that encourages students to make clear presentations to varied audiences, work in teams, and be subject to disciplined design reviews. These experiences can be very valuable to students, regardless of their future career choices. Industrial participants sometimes help advise students and teach at UMP, therefore reaching wider academic audiences.

METHODOLOGY

The case study is a method in which a phenomenon is studies and analyzed in its real context, seeking to assess the decisions that were made, why certain attitudes were taken and what their results were. In this way, the causes and consequences of the phenomenon and its development will be made clear, always at the time and under the circumstances in which they occurred.

James indicated that^[4] successful university-industry collaboration should support the mission of each partner. Any effort in conflict with the mission of either partner will ultimately fail. The core mission of the university has three major components: the education of students, the creation of knowledge, and the dissemination of knowledge. The core mission of industry is to generate value for society by creating useful goods and services, providing financial returns for shareholders and other investors, and expanding the state of the art.

University Malaysia Pahang is involved in a large panel of research activities covering, the most reported in the questionnaire are:

- ◇ The effects of education in UMP
- ◇ Attention to UMP after graduate
- ◇ Affections of career by education in UMP
- ◇ Suggestion for the improvement in the future development

- ◇ The activity for employment
- ◇ The harvest of studying in UMP
- ◇ The important advantage for students graduated from UMP
- ◇ The disadvantage for students graduated from UMP
- ◇ Approach for finding the first job
- ◇ The important parameters for choosing job
- ◇ The suggestion for improving the career in UMP
- ◇ The quality of education in UMP
- ◇ Suggestion for improvement in future education
- ◇ The course structure in UMP

The questionnaires paper were prepared base on the objective. 100 copies of the questionnaires paper were submitted to the student from mechanical engineering in UMP. Several small work shops were held at the same time for collecting the suggestion. The data and suggestions were collected and analyzed with excel.

RESULT AND DISCUSSION

The questionnaire of the case study was analyzed, the results were cited as below:

100 students from Faculty of Mechanical Engineering in UMP were interviewed. All the students study for their bachelor degree, and their ages are all below 29.

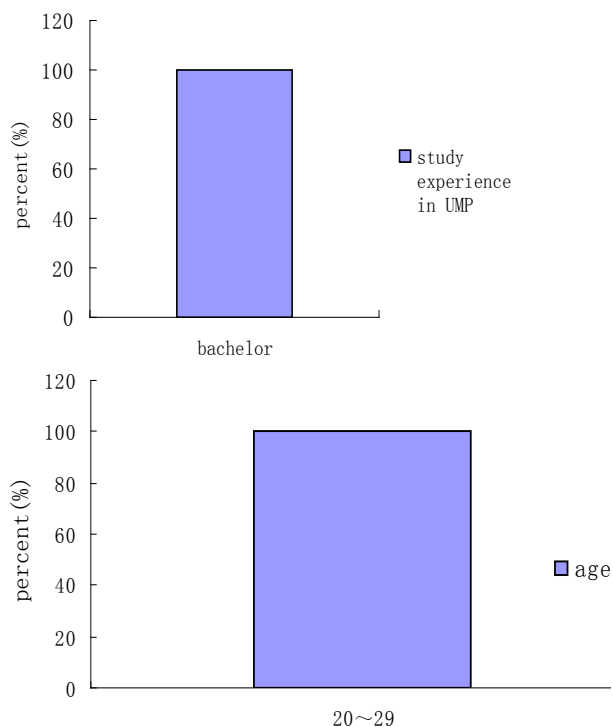


Figure 1
Study Experience and Age in UMP

The qualities of education were asked and the results were cited in figure 2. It can be seen from the results that 45% interviewees gave the evaluation as great while

54% interviewees gave the evaluation as common. Only 1% interviewees feel that the quality of education in UMP was not so good. With this investigation, the educational quality in UMP can be recognized to fit for the requirements of students.

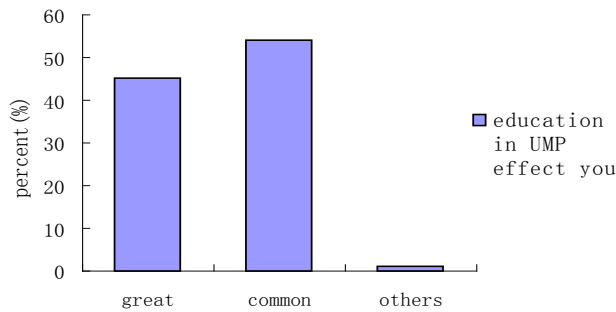


Figure 2
The Effects of Education in UMP

The attention to UMP after graduate were inquired and cited in figure 3. It can be seen from figure 3, 93 % of student will pay attention to UMP even after graduation. 19% of the student showed serious attention to UMP and 40% will continue the attention. Only 7% of student will lose their interest about the education, program and development when the interviews were make.

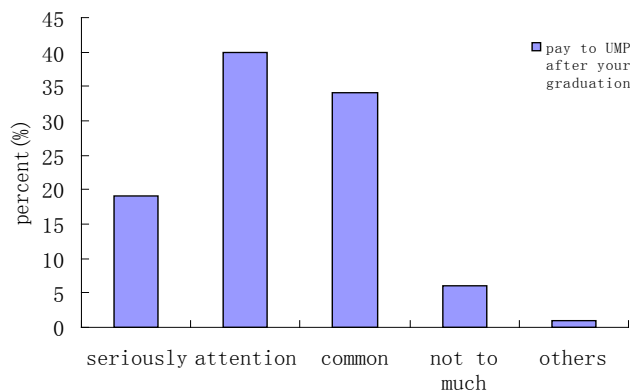


Figure 3
Attention to UMP After Graduate

The affection of education for the career were investigated and cited in figure 4. Most of the students tend to continue their career base on the subject which they studied in university, they are willing to see the development of education in UMP. With in the 100 interviewees, 34% of interviewees think that the education will play a very important role for their work in the future, 54% think the affection will be important. Only 2% of the interviewees may change their subject after graduate and the affection are recognized to be not important to their career in the future.

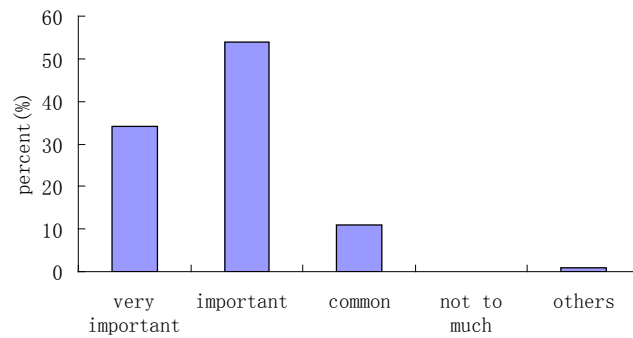


Figure 4
Affections of Career by Education in UMP

The suggestion of improvement for the development of education were investigated and cited in figure 5, 46% of the students suggested that the education should be transferred from knowledge to industry. 30% of the students hoped to improve the training for graduate student. It can be concluded that most of the students were wish to use their knowledge to industry and have more chance to join the experiment. Most of them have a plan to continue their study after graduate.

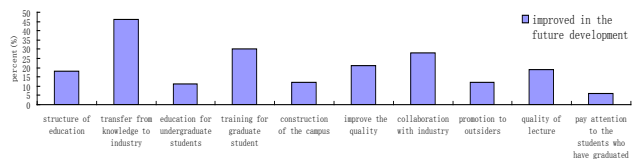


Figure 5
Suggestion for the Improvement in the Future Development

The effect for employment with different subject were investigated and cited in figure 6. 74% of the students think that experiment & practice is the most important part for employment. 22% of the students think that research and design is the useful part for employment. And another 14% of the students think that Theory, special knowledge, social practice are the useful activity. Most of them recommended experiment & practice is the most useful activity for employment.

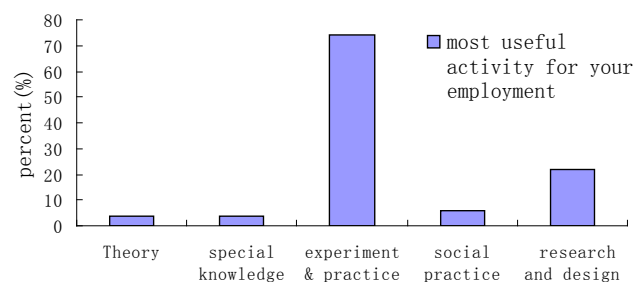


Figure 6
The Activity for Employment

The harvest for study in UMP was studied and cited in figure 7. 38% of the students think that technology and knowledge was the most important part that they can learn in UMP. 37% of the students think that technology and knowledge is the most fruitful harvest. Beside this, thinking, planning and designing, ability for management is recognized as the second important harvest. 20% of the students think that thinking, planning and designing is their fruitful harvest. 10% of the students think that ability for management is what they can learn in UMP. Most of them have comprehensive development when studied in UMP. It can be conclude that the education in UMP can fit for the requirement, they can teach the student with technology, knowledge, design and management.

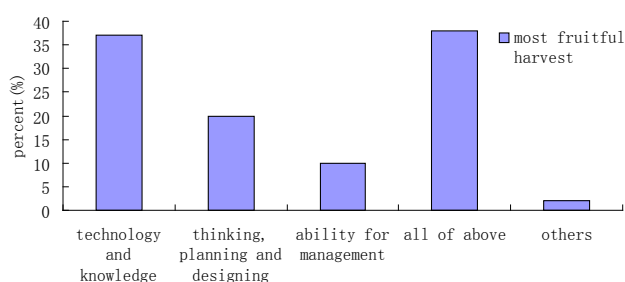


Figure 7
The Harvest of Studying in UMP

50% of the students think that technology and knowledge is the most important advantage after graduation while 49% of the students think that the most important advantage is practical ability as seen in figure 8. Other 10% of the students think that basic theory, corporate ability and study ability is important advantage that they can obtain from their studying. It can be conclude that the education of UMP not only teach the students with theory, technology and knowledge but also the practical ability.

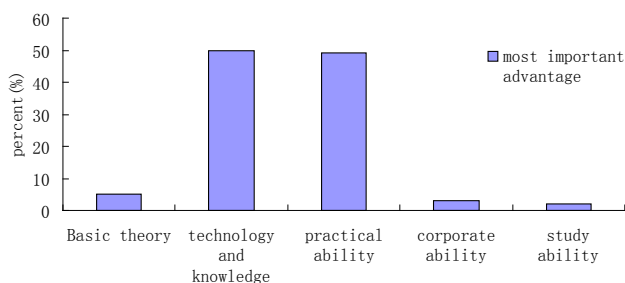


Figure 8
The Important Advantage for Students Graduated from UMP

Comparing the result of disadvantage with the advantage, it can be found that the education of practical ability, corporate ability and study ability in UMP are

still not enough, that need to be improved in the future education. During investigation, 27% of the students think that study ability are not enough as shown in figure 9. 24% of the students think that basic theory is also important which need to be taught clearly, 23% of the students think that corporate ability is important, 20% of the students think that practical ability is important. However the training for improvement those abilities are still not enough. It was suggested that during education, basic theory and developed ability have to be improved in order to fit for the requirement of industry, they are as important as the technology and knowledge.

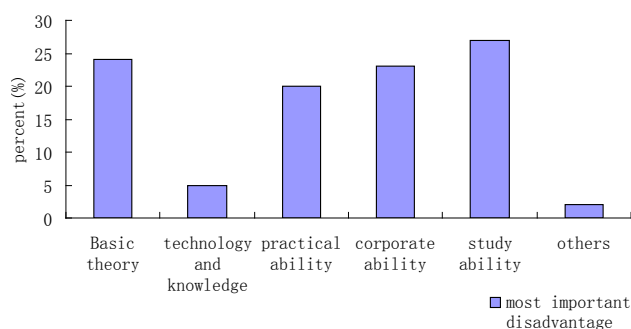


Figure 9
The Disadvantage for Students Graduated from UMP

How to find first job was investigated and cited in figure 10. 36% of the students gave the result that their first job was applied from career agency. 32% of the students find their first job from website. Only 17% of the students got their first job which commended by UMP while 17% of the students got their first job commended by friend. It can be found that the major way for students to find job was career agency and web site. Only a little part was from the introduction by UMP. It was suggested UMP should have more collaboration with the industry which can help their students to have more opportunity to learn from the industry and do contributions to the industry soon after they graduate

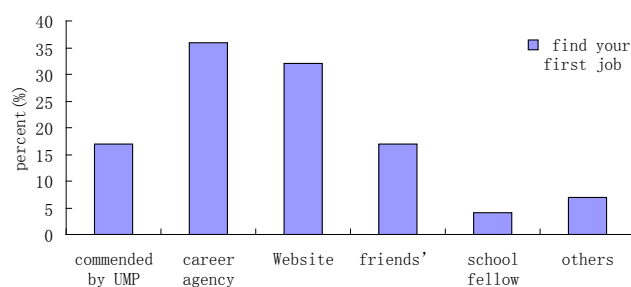


Figure 10
Approach for Finding the First Job

The parameters for choosing job were investigated and cited in figure 11, 51% choose the development for their

future career as the most important parameter for job. The second important parameters is income, 19% of the students choose this one. The third important parameter is the region for working, 16% of the students chose it as the most important parameters for choosing job. 13% of the students recommend as the opportunity for promotion and 9% of the students recommend the quantity of the employer. It can be seen from the investigation, the development is the most important part when the student chose their job, so the education should be also pay attention to the develop of the students.



Figure 11
The Important Parameters for Choosing Job

As seen from the suggestion cited in figure 13, 52% of the students think that more information from industries needs to be imported to the career. 23% of the students suggested that the worthy of the work should be improved. 16% of the students think that the tutors for career need to be improved for career. 12% of the students suggested that better policy need to be improved for career. It can be conclude that more than 75% of the student hope tutors for their career which can be improved in their education and they are desired more information from industry. The guide for career has to be improved in UMP.

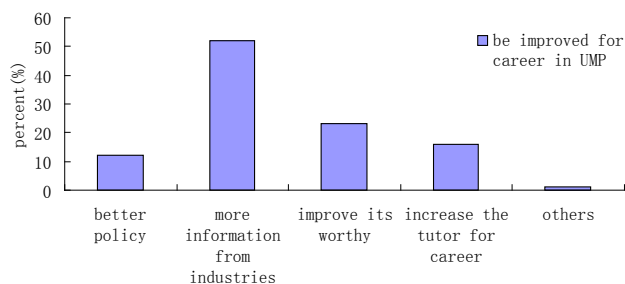


Figure 12
The Suggestion for Improving the Career in UMP

Whether the subject fit for the future work was investigated. As seen in figure 13, 67% of the students think that the subject is basically fit for the requirement while 21% of the students think the conditions are perfect. Only 9% of the students think it can not fit for

the requirement. Although the subject can fit for the requirement for work, it still needs to be improved to become perfect.

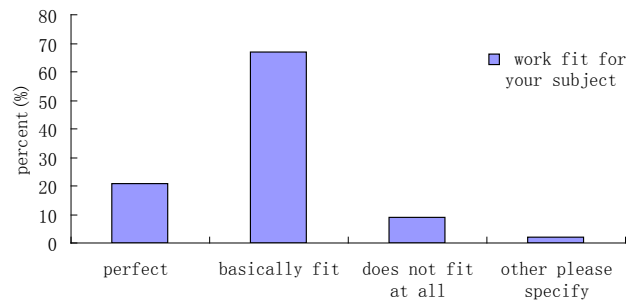


Figure 13
The Quality of Education in UMP

The suggestion for how to improve the education was investigated and cited in figure 14. 38% of the students suggested that practice need to be improved and 33% of the students recommended that the knowledge should be also improved. 30% of the students think that technology and knowledge should be improved in the future. Only 7% of the students recommended as basic theory. It can be seen from the result that practice, renovation of the knowledge and technology and knowledge still need to be improved in the future education, they should follow the development of new theory and technology.

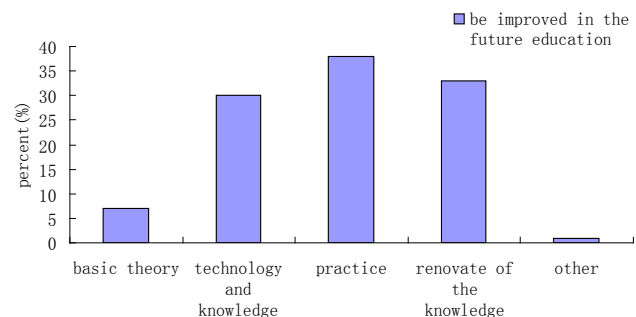


Figure 14
Suggestion for Improvement in Future Education

The condition of the course structure in UMP was studied and cited in figure 15. 59% of the students think the structure is reasonable. 16% of the students think it is perfect. However, 14% of the students recommended that the previous structure is not so fit for the requirements. 11% of the students think it still has a big distance to be good. As seen in the result, the previous structure can fit for the requirement; it can be perfect if it can be improved with the education experience.

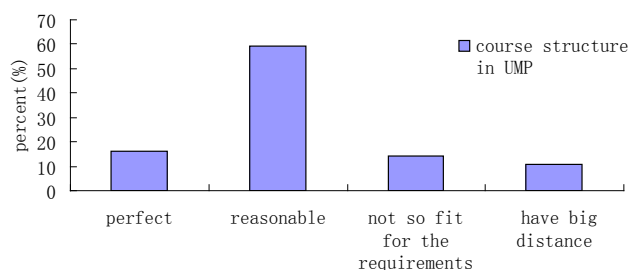


Figure 15
The Course Structure in UMP

CONCLUSION

With this investigation, the educational quality in UMP can be recognized to fit for the requirements of students. Most of student will pay attention to UMP even after graduation. Most of the students tend to continue their career base on the subject which they studied in university, they are willing to see the development of education in UMP. Most of the students were wish to use their knowledge to industry and have more chance to join the experiment. Most of them have a plan to continue their study after graduate. Most of them recommended experiment & practice is the most useful activity for employment. Most of them have comprehensive development when studied in UMP. It can be conclude that the education in UMP can fit for the requirement, they can teach the student with technology, knowledge, design and management. It can be conclude that the education of UMP not only teach the students with theory, technology and knowledge but also the practical ability. However the training for improvement those abilities are still not enough. It was suggested that during education, basic theory and developed ability have to be improved

in order to fit for the requirement of industry, they are as important as the technology and knowledge. It can be found that the major way for students to find job was career agency and web site. Only a little part was from the introduction by UMP. It was suggested UMP should have more collaboration with the industry which can help their students to have more opportunity to learn from the industry and do contributions to the industry soon after they graduate. The development is the most important part when the student chose their job, so the education should be also pay attention to the develop of the students. More than 75% of the student hope tutors for their career which can be improved in their education and they are desired more information from industry. The guide for career has to be improved in UMP.

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