

# INDUSTRIAL TRAINING PROGRAMME IN THE DEPARTMENT OF CHEMICAL ENGINEERING, UTM: LESSONS LEARNT

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## ABSTRACT

The undergraduate students at the Chemical Engineering Department at UTM are required to undergo industrial training programme at any related industries nationwide. There are several factors that need to be taken into account as students may face some difficulties during the training period. Behind the scene, the coordinator holds several important tasks that require full commitment and motivation to serve students. This paper describes the procedures and the lessons learnt from the early beginning students preparing to apply until the applications are approved as well as the coordinator's roles and responsibilities to assist and provide good guidelines to ensure all students achieve the objectives of industrial training.

**Keywords:** Industrial training, coordinator's responsibilities, coordinating experiences, management approach

## 1. INTRODUCTION

Industrial training, for decade has become a substantial requirement for undergraduates from engineering and technical disciplines to comprehend application of theories that being taught in classrooms. In general, industrial training comprises a hands-on exercise, mingling with other employers and real working environment, where the experience and exposure cannot simply be grasped by lectures. Industrial placement has been used as a learning tool to develop students' ability under professionals' supervision from industries, where students are anticipated to enhance their skills and attributes in communication, problem solving and teamwork, as a stepping-stone to meet the challenges of the workplace (Wankat and Oreovicsz, 1993). From this programme, students may also learn the essence of professional skills and ethics. Furthermore, they can use this opportunity to create liaison, and to contribute ideas and suggestions for the improvement of industries.

In Malaysia scenario, students from local and private universities as well as those from polytechnics are normally looking for private and government sectors. The application procedures are usually being carrying out by students themselves. Nevertheless, some institutions do identify and prepare the places for their students. Organizations that are to be selected for industrial placement, of course should be related to their course or major. In most cases, the period of training is varying from eight weeks to eight months, depends on each institution requirement.

In UTM Skudai, industrial training is regarded as a compulsory element for four out of five courses in the Faculty of Chemical and Natural Resources Engineering, namely chemical, chemical-bioprocess, chemical-polymer and chemical-gas. However, students from petroleum engineering course only are recommended to undergo industrial training. Here, industrial placement usually takes place during third semester every year and students are required to fulfill a minimum of ten weeks attachment. It has become a tradition in this faculty where the third year students are given the freedom and opportunity to seek for suitable places across the nation at the early beginning of second semester. In recent development, students are not allowed to do their training within the

campus starting from year 2004 onwards, thus they are encouraged to be more insistent in their undertakings.

The unique about Chemical Engineering Department compare to other departments in the faculty is number of students. Although there was a decrease in number of chemical engineering students undergo industrial attachment from about 200 in year 2004 to 150 in year 2006, it still two to three times greater than number of students from the other departments. Thus, the management approach based on experience since 2004 really helps a lot to coordinate and assist students in subsequent year.

This paper represents the procedures being exercised by chemical engineering students with regard to industrial training for the last three years, and the events that have been practiced by the coordinator to manage industrial training within the department. Also, factors that students should put in mind while searching for places and solutions for constraints while carrying out this task shall be discussed.

## 2. APPLICATION PROCEDURES

Since 2005, the coordinator has implemented a pre-briefing for the third year chemical engineering students, which is aimed to provide clear direction for obtaining a trainee position. In this session, students are supplied with information that need to be taken into consideration while searching for training places, such as resume, cover letter, directory of organizations, allowance, accommodation and transportation (Wankat and Oreovicsz, 1993). In this circumstance, students will be encouraged to search the nearest location to their home, and also have an allowance incentive.

There are few sources that students can refer to identify location of interest for their industrial training. As for example, FMM directory, e-directory and MATRADE database, which can simply be browsed from the Internet (FMM, 2004, MMDTP, 2000 and MATRADE, 2004). Although these web pages provide valuable information concerning location, types of activities and contact number, students seem prefer to utilize directory of industries by the department. This directory is developed using MS Access and consists of details of industries where chemical engineering students did their industrial training since year 2001. Fig. 1 below represents the interface of the directory, which currently comprises more than 700 organizations nationwide.

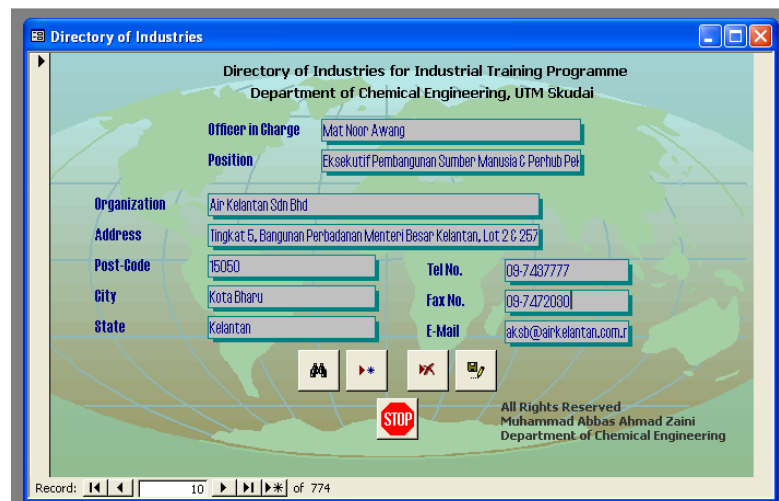


Fig. 1. Interface of directory of industries.

Cover letter, resume and testimonial are three items that must be put together for industrial placement application. Students should personalize their own resume, write a cover letter through the coordinator demonstrating their intention and fill in a form to obtain a testimonial which will be endorsed by the academic registrar office. All forms are first directed to the coordinator in the first place for preparation of students' information database, which later can be linked with directory of industries by simple MS Access relationship. This record is important to classify students who do not receive any offer at specified time frame. Moreover, they can also be sorted accordingly by data field, which make it a prospective tool to replace Excel spreadsheet which currently be used to accompany faculty representatives to visit students in industries. Fig. 2 below depicts the interface for students' information database.

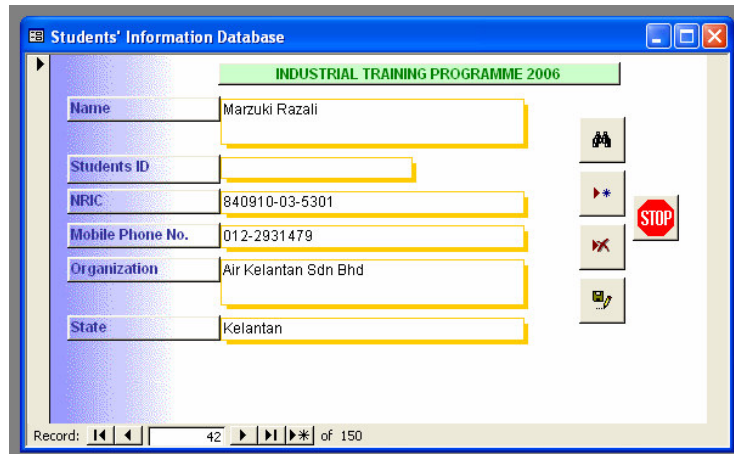
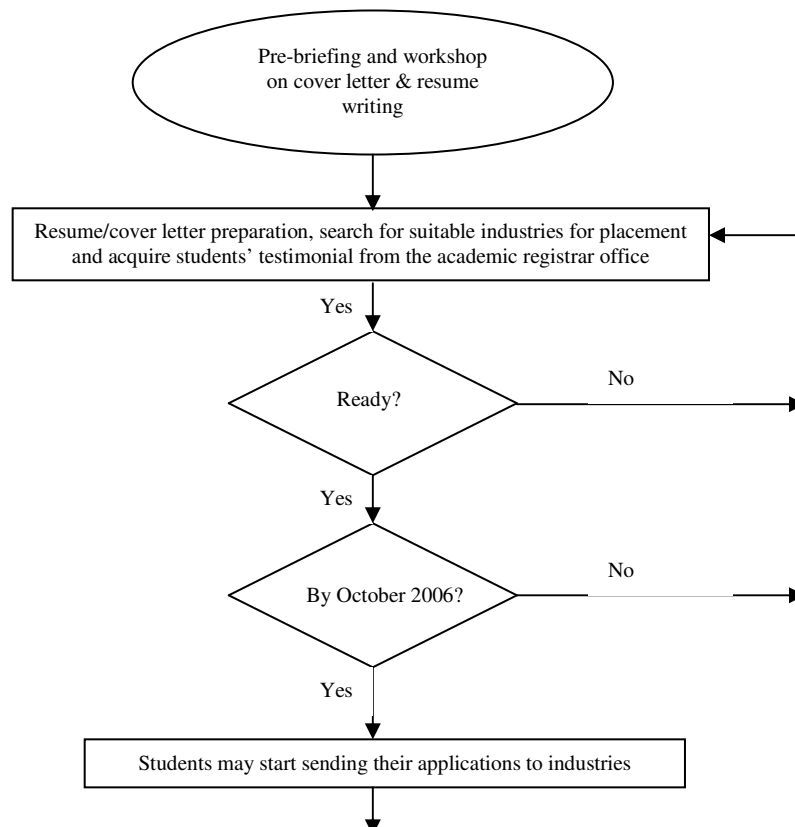


Fig. 2. Interface of students' information database.

Students often get response concerning their application through letter and phone call, one to two months prior to commencement of industrial training. To avoid delay and uncertainty on the application status, students are encouraged to make phone calls to organizations where they submit the application. There is no doubt that some students' application to industries possibly will be rejected. Normally, students may send their application up to 10 places but some may turn up not getting any answer. Based on experience, almost one-third of chemical engineering students received more than one offer every year. Here, unlucky students can apply for replacement through the coordinator instead of making new application. Notwithstanding that, not all replacement will be accepted by organizations. The remaining offers that unused for replacement will be cancelled via phone call and official letter.

Since 2004 until now, chemical engineering students managed to get 100% placement for industrial training. The organizations ranging from multinational companies, factories, government sectors, consultants and research institutions nationwide. Fig. 3 below summarizes the application procedures that have been practiced by chemical engineering students for the last three years.



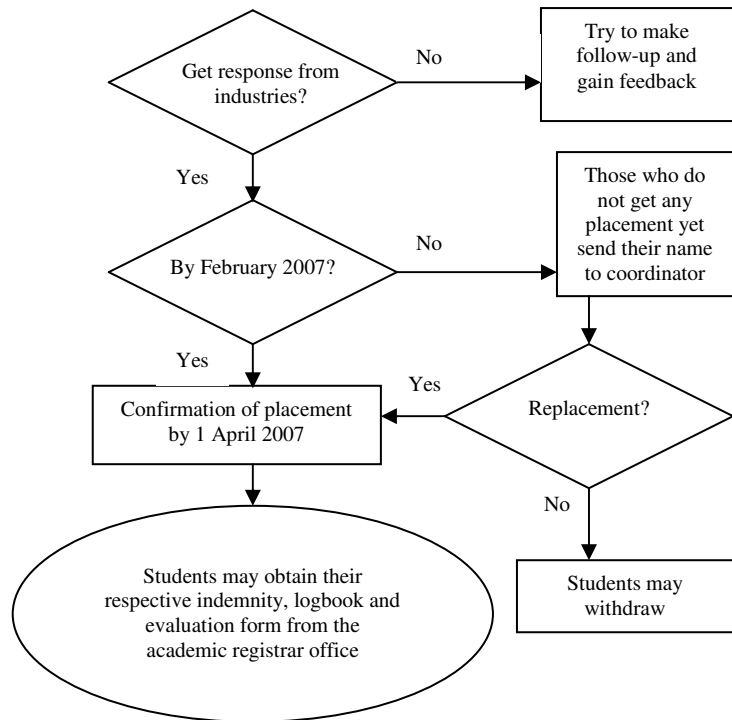
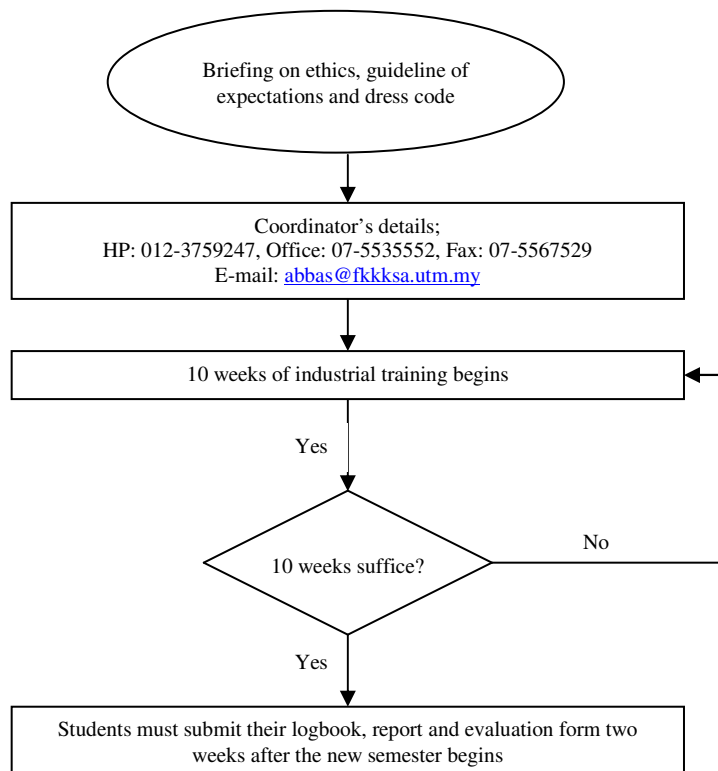


Fig. 3. Step-by-step procedures for students' application to industries.

### 3. ASSESSMENT STRATEGY

All students who are about to pursue for industrial training are required to attend a briefing on work ethics and dress code by faculty representative. Students are also allowed to keep coordinators' contact details, if there are related situations that need coordinator's clarification during the training period. The following flow chart (Fig. 4) shows sequence of action for students to take note before leaving the faculty for industrial placement prior to the satisfactory of the programme.



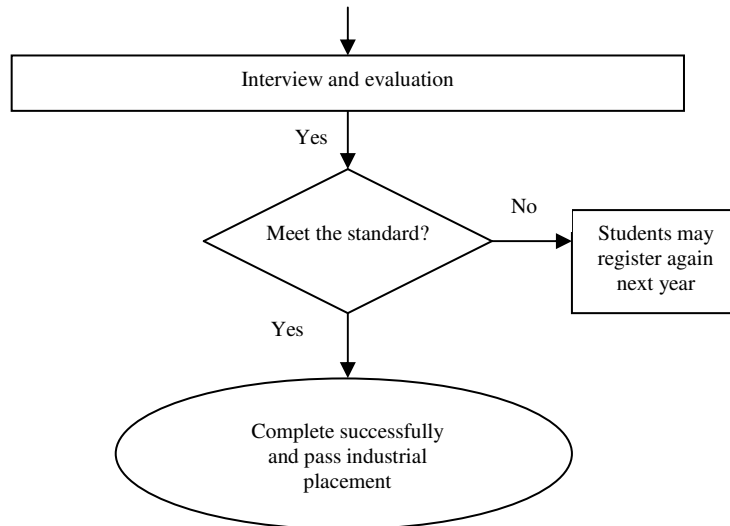


Fig. 4. Accomplishment of students' industrial training.

In the mid of industrial training period, a number of lecturers from the Faculty of Chemical and Natural Resources Engineering will be appointed to supervise students. Besides evaluating students' performance, they are also ambassador who responsible to instigate discussion on research opportunities and service that the departments and the faculty can offer to the organizations.

The different approach is used for evaluating students at the Department of Chemical Engineering. There will be an interview session conducted by coordinator two weeks after students finish their training. In this occasion, students should bring along their respective logbook, training report and evaluation form. Organization representative should first fill the evaluation form, and the assessment carries 30% out of total mark, while another 50% comes from training report. The passing grade for this programme is 50%. During the session, students will be required to describe tasks being assigned, challenges being faced and problems being encountered. This event has been a medium for students not only to share their experience but also to convey any suggestions that related for the improvement of industrial training at the department and for the benefit of the forthcoming students.

According to past experience, students from Chemical Engineering Department can successfully accomplish this programme as long as the procedures are thoroughly followed and put in practice. Nevertheless, their performance and relationship with other employees especially the corresponding supervisor in organizations also contribute to the passing grade.

#### 4. ROOM FOR IMPROVEMENT

For the Department of Chemical Engineering, improvement can be regarded as an important parameter to enhance the management of industrial training programme. Albeit the track record for the last three years shows all students able to get place for industrial training, there are lots of inputs that can be implemented to upgrade the success in coordinating the programme.

Among the suggestions are as follows:

1. Construct a list of incentive/allowance providers, whereby more than 50% students for next industrial training will get paid.
2. Construct a list of outstanding training providers.
3. Conduct a workshop on resume writing.
4. The students themselves must carry out replacement and cancellation procedures.
5. The department must not receive any complaints from the organizations concerning unanswered offer. Students who are irresponsible will be penalized, i.e. fail or subject to procrastinate.

It seems students should put lots of effort and be more independent throughout the application procedures. Nonetheless, the coordinator is still a source of reference where students can seek advice about the industrial training programme.

## **5. CONCLUSIONS**

The Department of Chemical Engineering has developed the application procedures for industrial training programme, which consists of inventory of industries, guideline and sequence of action that must be followed by the students. Also, the department has managed to maintain 100% students able to get offer since 2004 through this approach. Both students and coordinator hold similar responsibilities to ensure the success of this programme. The improvement is important to boost the excellent coordination of industrial training.

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