

Surviving the First Year Engineering Programmes at Universiti Teknologi Malaysia.

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Abstract: Coming to a university can be invigorating experience – students will make lots of new friends, meet a variety of people and be influenced by numerous new experiences. It may well be the first time students have lived by themselves and the prospect of such freedom is very exciting. Students have probably been looking forward to it for a long time. However, some students find that after the novelty wears off, they start to feel comfortable and that started to affect their studies. Many found that the skills that they possessed to survive the high school were not sufficient for engineering school. Problems faced by students during their first year of campus life were studied. Issues such as family, friends, finance, study skills and studying environment are highlighted in questionnaire filled by students. Several measures have been taken or planned by the faculty either to minimize the gap or to equip them with the right skills are also mentioned in the paper. Introducing a new subject called “Introduction to Engineering” was one of the gallant steps taken by the faculty and together with UBRP, i.e. faculty’s student support and counselling unit, workshops and camps were organized.

1.0 Introduction

Industry executives are well aware that new engineering graduates have a long way to go before they can “earn their salary.” New engineering hires are thus provided with formal training, on-the-job training, close supervision, progressively more challenging assignments, rotating work assignments and time to mature.

Strangely, when new students come to the university, they are left primarily on their own to figure out how to be successful. Academic organizations seem more interested in evaluating their newest members than in doing things to ensure that they succeed. Within engineering education, this approach is not working. In the US, only about 40 percent of students who start engineering study ever graduate. Most drop out, flunk out or change their majors and many of those who do graduate fail to work up to their full potential [1].

This paper explores the problem faced by students during their first year campus life. Problems

such as study skills, relationship with lecturers, family, friends, finance and learning environment were investigated through a survey.

2.0 First Year Experience

The experiences of first year university students have become a major focus of concern in the US, the UK and Australia. This has been prompted by factors such as increasing student numbers, widening diversity in the backgrounds of students, high student drop out rates in first year, and the accelerating implementation of teaching technologies and flexible course delivery [2]. In 1995 there were three international conferences held on the topic. In the US, where first year students of both genders are referred to as ‘freshmen’, a National Research Centre for the Freshman Year Experience has been set up at the University of South Carolina [3] and *The Journal of The Freshman Year Experience* was established in 1989 [4].

In 1994 the Committee for Advancement of University Teaching (CAUT) in Australia commissioned a study by the Centre for the Study of Higher Education, University of Melbourne into the first year experience, mainly because of concerns about “the rapid growth of student participation levels in universities” and the diversity of the first year student population that resulted. It sought to identify “ways in which the first year teaching and learning environment for on-campus students could be enhanced [2].” The study has identified a number of issues for first year students such as:

- social integration
- drop out rates
- attainment of learning skills
- attainment of generic skills

Some of the issues are quite relevant to engineering students at UTM and will be discussed here.

3.0 Methodology

A set of questionnaire was given out to a group of first year engineering students at Faculty of Chemical and Natural Resources Engineering, UTM at the end of second semester, academic session

2003/2004. The three-page questionnaire used for this study was developed by all the academic advisors of the target group. The content of the questionnaire was broad and covered the following areas: finance, teaching and learning and social. Analyses then were carried out based on the results of the survey. The survey took approximately 5 minutes to complete.

4.0 Results and Discussion

There are three main aspects being investigated in the study i.e. Finance, Teaching and Learning and Social Life. In this study, 38 out of 92 respondents are male and 54 are female. Distribution of the respondents is tabulated in Figure 1. Based on the survey, 76.1% of the respondents who received either loan or scholarship faced no financial problem. However 26.4% of the respondents felt the amounts they are getting from these sources are not sufficient and hence disturbing their study (see Figure 2).

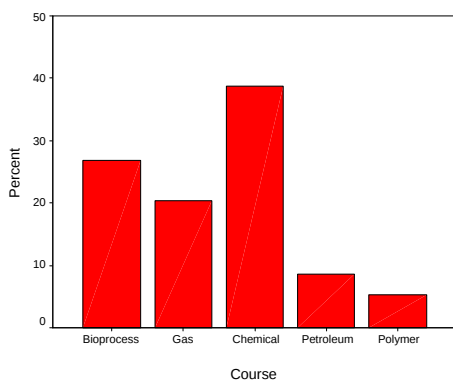


Figure1. Distribution of respondents

From Figure 3 in the perceptions toward lecturers, 43.3% of the respondents could not comprehend the lectures delivered, and 77.2% believed the lecturers covering the material at a fast pace. For the note taking skills, from Figure 4, 38.5% declared they did not have the proper skills and 32.6% claimed they only used the notes given and did not make any additional reference. The first year students are rather poor in their referencing skill. Whilst 57.8% felt that there were not enough references available, only 56.5% of them used the library or the resource centre. 81.5% felt the location of the library was giving them problem because it is quite far from their residence halls as well as their classes.

Respondents were asked to give their views on the curriculum and syllabi of the programmes. 71.7% of the respondents felt the content of the subjects taken were a little bit too much to be covered in one semester whereas, 55.4% thought the total credit hours given for each semester were quite demanding.

48.9% of the respondents believed the combination of subjects offered in each semester was not appropriate.

51.1% of the respondents felt the available classrooms were not conducive and 39.1% said the facilities were not appropriate. The location of classrooms which are quite a distance from the residence halls has caused problems to 70.7% of the respondents.

From the aspect of study skills, Figure 5 shows 87% of the respondents like to study alone rather than in a group but 85.9% said they would ask someone when faced with difficulties in their study. Only 42.4% formed study groups and 66.7% claimed they have poor time management. Another alarming phenomenon from the result is only 34.8% of the respondents would meet their lecturers whenever they are facing difficulties in their study.

Accommodation seems not to be a problem to all the respondents since all of them are staying at the residence halls and only 17.4% did not feel comfortable with the condition of the halls as shown in Figure 6. However, even though 73.9% felt their residence halls are quite far from classrooms only 7.6% took the bus ride (which was provided by the university) to classes.

In Figure 7 students were asked about their emotional balance and intelligence and it was found out that 59.8% claimed they were very emotional when faced with problems and 46.7% said those problems have affected their studying. In sharing their problems, only 10% would do it with their lecturers, 50.5% with their family members and 79.3% with their friends.

Results of the survey indicated that respondents practiced imbalance diet (73.9%), ate instant food (67.4%), did not exercise (60.9%), did not play games (68.5%), did not participate in society (55.4%), and spending a lot of time loitering with friends (64.1%).

Another surprising finding from the survey as shown in Figure 8 is on the respondents self confidence. 52.2% showed low self confidence and 58.7% felt inferior just being amongst their friends.

From the survey it could be summarised that many students had negative views towards lecturers, course arrangements, transport facility, study skills and their self confidence. For example:

- About 43.3% of the respondents could not understand their lecture sessions.
- 77.2% believed the lecturers covering the material at a fast pace.
- 38.5% declared they did not have the proper note taking skills.
- 71.7% of the respondents felt the content of the subjects taken were a little bit too much to be covered in one semester.
- 48.9% of the respondents believed the combination of subjects was too demanding.

- 87% of the respondents like to study alone.
- 46.7% said personal problems have affected their studying.
- 52.2 % claimed to have low self confidence.
- 58.7% felt inferior amongst their friends.

By acknowledging these deficiencies, measures have to be taken to help the students to be more prepared physically, mentally and morally towards their survival in the engineering programmes.

5.0 Addressing the Issue

Universities have responded to the problems associated with first year in various ways. Often particular groups of students are targeted. Sometimes the aim is "compensatory", that is to make up for a lack of learning skills and preparation in some students, to bring them up to the level of the average school leaver. Some university faculties provide "foundational" programs that aim to give students a general background in the field of endeavour before they choose their specific specialisation and get started in higher education. For example in the US, faculties such as engineering often have a common first year before students are separated into particular branches of engineering. Some universities also offer transition programmes for students coming from school to university, sometimes during the summer, that "aim to promote integration into and affiliation with the university [2]."

Based on the results of the survey, the Faculty of Chemical and Natural Resources Engineering of UTM, has introduced a new subject called Introduction to Engineering which has to be taken by all first year students in the faculty beginning semester 1, session 2004/05. Among the objectives of the subject are to:

- provide the basic study skills required to survive in engineering programmes
- highlight the generic skills that they need to acquire through out their degree
- encourage students to form study groups
- encourage students to reflect on various study techniques and to adopt those best suited to their learning styles
- set the stage for new study practices by stressing that learning in university involves more than memorizing

A group of senior lecturers were selected to teach the subject and several discussions were taking place to decide not only on the syllabus but also on the teaching methods, class policies, assessments and teaching materials. The syllabus of the subject is shown in Table 1.

Furthermore, UBRP i.e. faculty's student support and counselling unit is also lending a helping hand to guide first year students. Several

programmes were carried out such as workshops on study skills. Counselling, motivational talks, outdoor activities such as camping are also part of the programmes arranged by the unit.

Table 1. Syllabus for Introduction to Engineering

TOPICS	CONTENTS
Engineering Overview	• What is engineering? • Engineering disciplines • Engineering job functions • Engineering as profession • Future challenges of engineering profession • Roles of BEM & IEM
Generic Skills	• UTM's Graduate Attributes - Communication skills - Teamwork - Problem solving - Adaptability - Lifelong learning - Self esteem - Ethics and integrity
Study Skills	• Mind map • Thinking skills • Learning styles • Studying strategies • Problem Solving & Case Study
Basic Calculations	• Introduction to engineering calculations • Units and dimensions • Conversion of units • System of units • Dimensional homogeneity and dimensionless quantities • Arithmetic calculations: scientific notation, significant figures and precision
Appreciate Math.	• Process data representation • Graphs – straight line, curve fitting, 2 point linear interpolation • Analysis problems
Computing Skills	• Excel - Iteration - Graph • Search engines - Library online • Case study
Ethics	• What are ethics? • Stages of moral development • Professionalism • Code of ethics • Responsibilities to employers
Seminar	• Talks on engineering profession
Plant Visits	• Visits to plant and laboratories

6.0 Conclusion

First year students face a number of problems in adjusting to university life. These include developing good relationship with lecturers, and attaining appropriate learning and generic skills. These problems are very pertinent to many engineering students and some measures need to be taken to address this problem. Introducing an introductory

engineering subject which is a normal practice in many universities in the US has proven to be able to prepare the mind set of first year students for doing engineering programmes, provide basic learning and generic skills required and bridge the gap between the school and the university environments.

References

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the Initial Experiences of Australian Undergraduates, Centre for the Study of Higher Education, University of Melbourne, September 1995

[3] Ben Gose, 'A New Approach to Ease the Way for Freshmen', *The Chronicle of Higher Education*, 8 Sept 1995, p. A57.

[4] S. Beder, *Addressing the Issues of Social and Academic Integration for First Year*, <http://ultibase.rmit.edu.au/Articles/dec97/beder1.htm>. Accessed 14/10/2004.

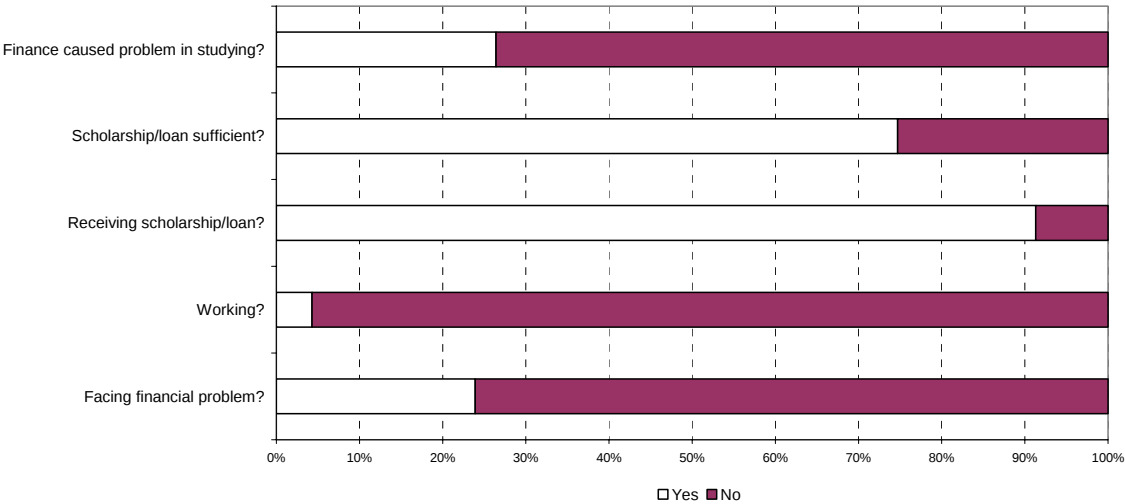


Figure 2. Financial Situation

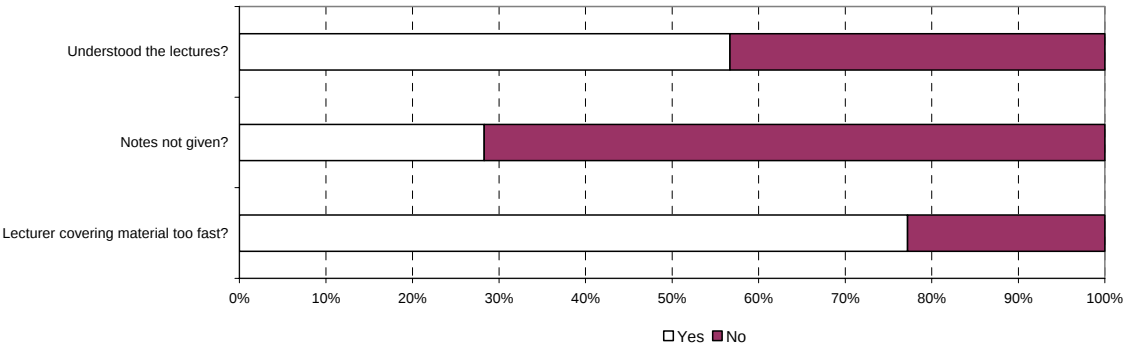


Figure 3. Perception towards lecturer

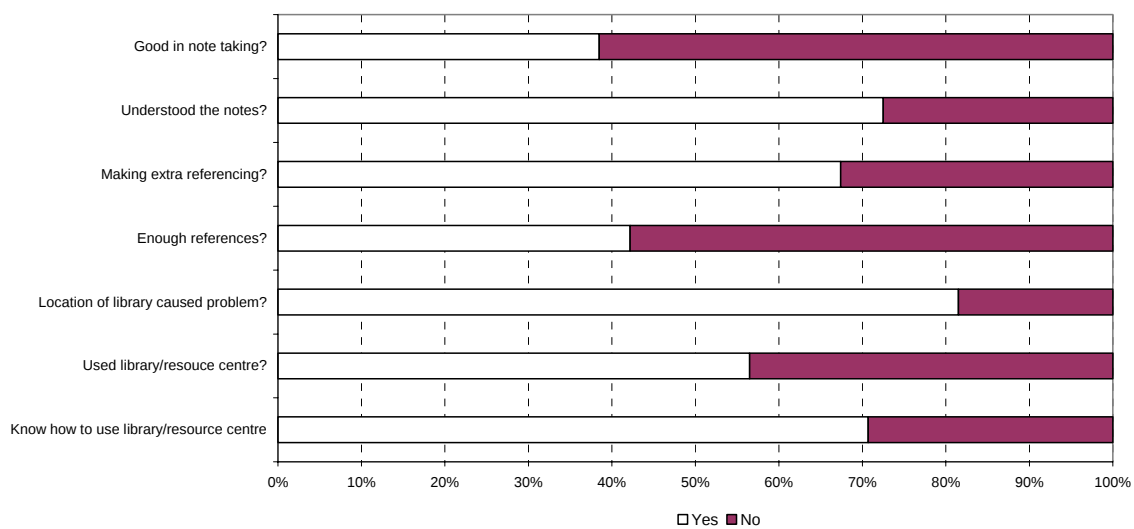


Figure 4. Note taking skills and Referencing

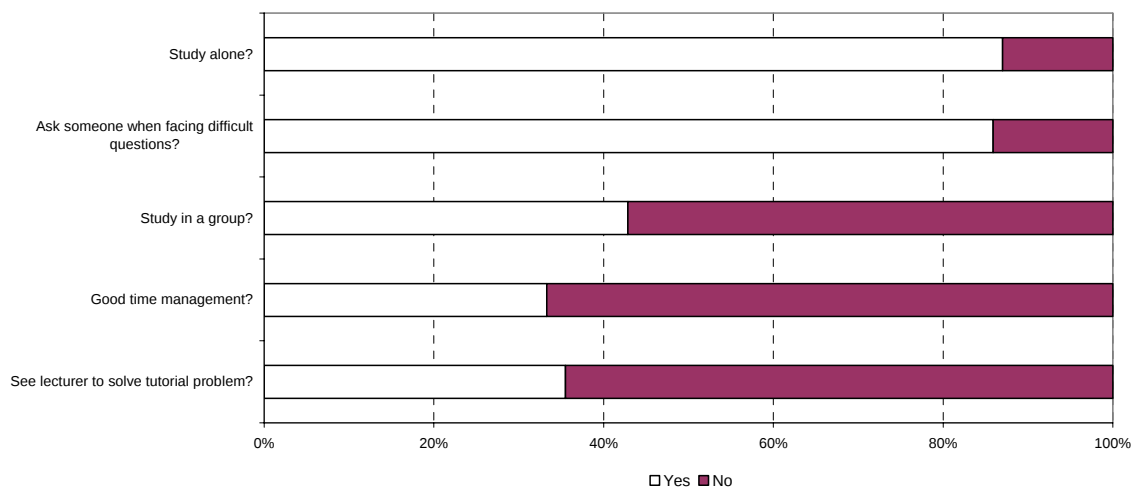


Figure 5. Study skills

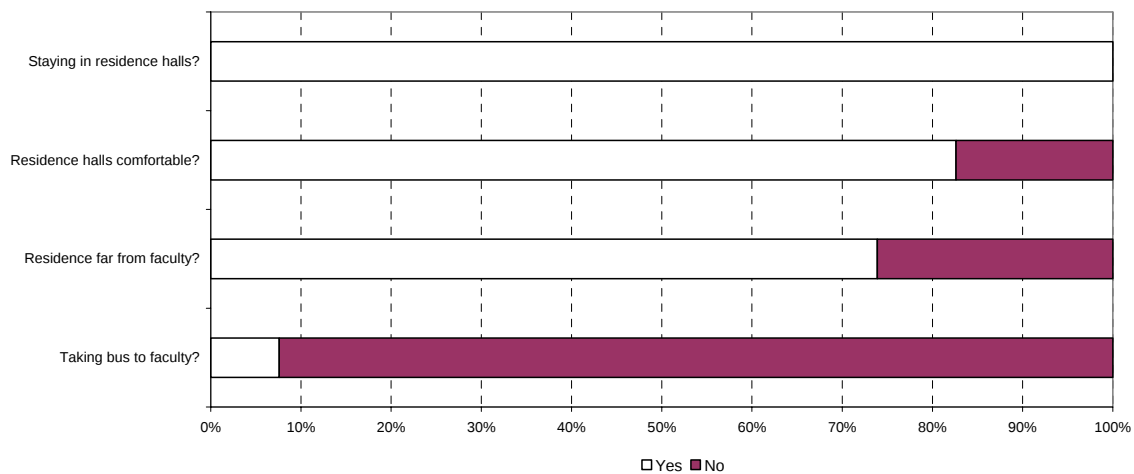


Figure 6. Accommodation and Transport

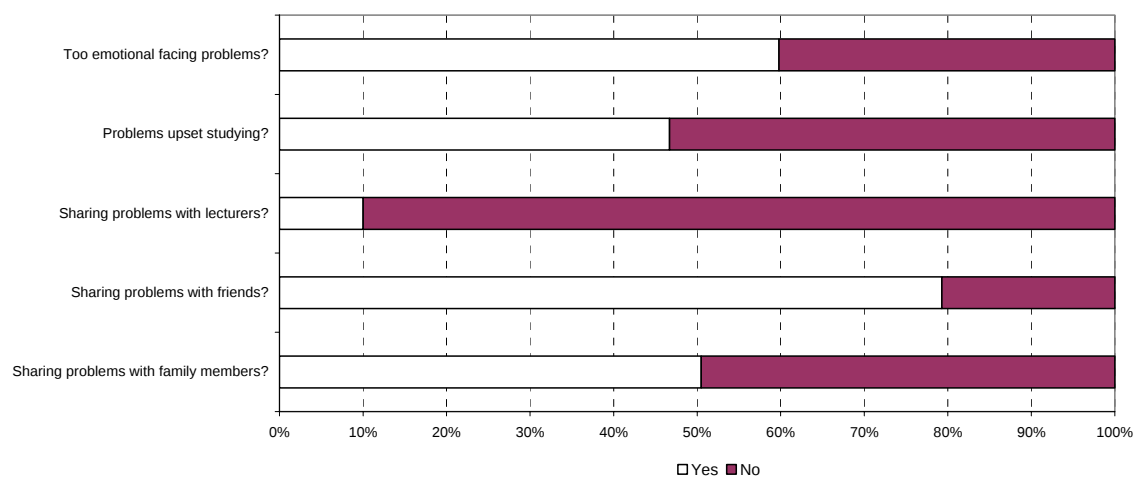


Figure 7. Emotional balance

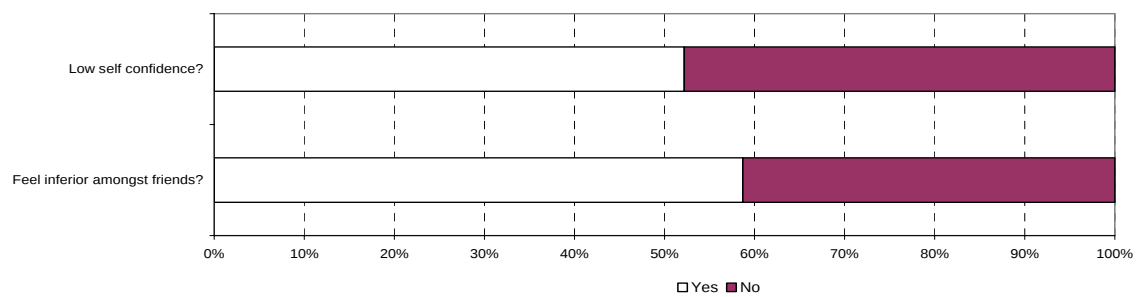


Figure 8. Confidence level