

## Students' Perception towards an Introduction to Engineering Course Using the OBE Approach at the National University of Malaysia

Azami Zaharim, Ibrahim Ahmad, Khalim Abdul Rashid, Hassan Basri,  
Mohd Jailani Mohd Nor & Abdul Halim Ismail

Engineering Education Research Group  
Faculty of Engineering, National University of Malaysia,  
Bangi, Malaysia

**ABSTRACT:** The Engineering Accreditation Council (EAC) of Malaysia has recently mandated that the outcome-based education (OBE) learning approach is to be adopted in engineering programmes in the country. At the National University of Malaysia (UKM), students have to take four engineering related courses in the first semester of all engineering programmes. The *Introduction to Engineering* course was identified by the faculty to be conducted using the OBE approach. For that course, three outcomes were identified i.e. *the ability to communicate effectively, attainment of life long learning skills and having the knowledge of contemporary issues*. The new course consisted of three components: introduction to engineering, communication and mathematics. A survey was conducted to obtain feedback from students. It was found that the OBE learning method was well accepted by the students and they achieved the identified learning outcomes designed for the course.

**KEYWORDS:** Perception, Introduction to Engineering Course, OBE Approach

### BACKGROUND

There are four engineering related courses offered during the first semester of engineering studies at UKM. The courses are: Introduction to Engineering, Material Science, Computer Programming, and Engineering Mathematics. The course identified to be delivered using the outcome-based (OBE) learning approach is the *Introduction to Engineering* course. Traditionally, this course was conducted through lectures, seminars, writing of reports and examinations. However, in Semester One of the 2004/2005 session, the delivery of the course began using the OBE learning approach.

This course had 406 registered students, but only 310 questionnaires were returned. The following four departments participated in this exercise: (1) Civil & Structural, (2) Electrical,

Electronics & Systems, (3) Mechanical & Materials and, (4) Chemical & Process.

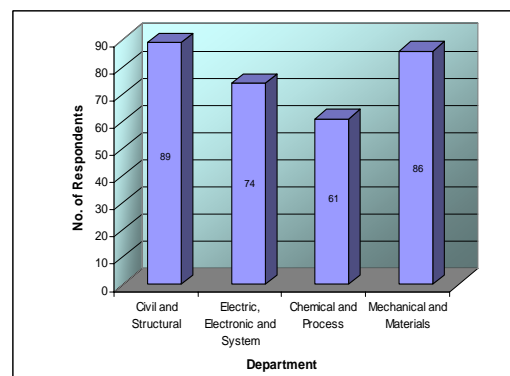


Figure 1: Distribution of first year engineering students based on departments

Figure 1 above shows the distribution of respondents. The Civil and Structural Department had the highest number of respondents, that is, 89 (28.7% out of total respondents), the Mechanical and Materials Department was the second highest, that is, 86

respondents (27.7%), followed by Electrical, Electronics and Systems Department which had 74 respondents (23.9%), and finally, the Chemical and Process Department had 61 respondents (19.7%).

### STUDENTS' PERCEPTION

Table 1 shows the response for statements 1 to 4. For Q1 and Q2, about 73% understood the objectives of the *Introduction to Engineering* course and about 75% knew that the course had three main objectives with only about 8% and 5% respectively disagreed with the two statements.

**TABLE 1: Response for Q1-Q4**

Scale	Q1	Q2	Q3	Q4
	%	%	%	%
Fully Agree	12.6	15.5	21.6	12.0
Agree	60.0	60.0	48.7	45.5
Neutral	19.0	18.7	22.9	32.1
Disagree	7.7	4.8	6.8	9.7
Strongly Disagree	0.7	1.0		0.6

Note:

Q1: Understanding course objective

Q2: Knowledge of the three components of the *Introduction to Engineering* course

Q3: *Introduction to Engineering* course is very useful

Q4: Ability to acquire and apply knowledge of basic science and engineering fundamentals

About 70% of the respondents agreed that the *Introduction to Engineering* course is a very useful subject in the engineering programme as stated in Q3. This means that the respondents needed this course to familiarise and enhance their knowledge in engineering. Only about 7% disagreed concerning the usefulness of the course.

However, based on Q4, only 57% of the respondents agreed that they had acquired and applied the knowledge of the basic science and engineering fundamentals, about 42% respondents disagreed, and interestingly, 2 respondents refused to answer this question. This is acceptable since the statement in Q4 is not related to any of the outcomes of this course. In fact it is too early for the respondents to have acquired this skill only after their first semester of studies.

The response for statements in Q5 and Q6 is shown in Table 2. These are related to the

views of respondents in the application of knowledge obtained from the course. Q5 was on the ability of the students to communicate effectively: Only 42% agreed with the statement. To communicate effectively is one of the expected outcomes. It is expected that the majority of students would not be able to communicate effectively at this stage, because this course is only the beginning of their communication experience in college. Only 1 out of 5 students (20%) were given the opportunity in giving oral presentations. Referring to the assessment results of the course, the average marks given by the assessor for the oral presentation by the students was 87%. Communication also included report writing skills, where the average mark given by the Academic Advisor was 80%.

**TABLE 2: Response for Q5 and Q6**

Scale	Q5	Q6
	%	%
Fully Agree	9.7	17.7
Agree	33.6	51.3
Neutral	40.3	24.8
Disagree	15.5	5.2
Strongly Disagree	1.0	1.0

Note:

Q5: Ability to communicate effectively

Q6: Knowledge and understanding of contemporary issues

The statement in Q6, *knowledge and understanding of contemporary issues*, is one of the expected outcomes of the course. The students would achieve this by attending seminars, viewing videos, literature search, writing of reports, and preparation for presentation. The response was 69% agreed, 25% were neutral and 6% disagreed with the statement. This means that the expected outcome for this course was achieved.

### CONCLUSION

- (i) The proportion of respondents who agreed with statements Q1 to Q4 ranges from 57% to 75%. So it is deduced that majority of the respondents understood the objectives of the course and agreed that this course was very useful. This shows that the delivery methods used in the course were effective.

- (ii) About 40% chose to respond neutral on the statement in Q5 i.e. *the ability to communicate effectively* and 68% realised the importance of *knowledge in contemporary issues*.
  
- (iii) As a conclusion, the majority of the students are aware of the three outcomes expected, i.e. *the ability to communicate effectively*, *attainment of life-long learning skills*, and *having the knowledge of contemporary issues*. These have been addressed in the course and the students agreed that these outcomes were achieved.