

Evaluation on the Effectiveness of Learning Outcomes from Students' Perspectives

Azmahani A. Aziz^a, Khairiyah M. Yusof^b, Jamaludin M. Yatim^a

^a Faculty of Civil Engineering, Universiti Teknologi Malaysia

^b Faculty of Chemical and Natural Resources Engineering, Universiti Teknologi Malaysia

Abstract

What are the obstacles in our teaching and learning process? This paper discusses the effectiveness of learning outcomes from the students' perspective on how they appreciate the existing learning outcomes through learning process. Comments from stakeholders such as graduate students who lacked basic knowledge and have difficulties in integrating knowledge learned or gained to solve engineering problems are highlighted. The survey was carried out on 185 engineering students selected from all years of study. Results from the analysis show that students' perspective toward learning outcomes need to be reviewed. As a recommendation, the content of curriculum has to be revised by introducing new courses which integrate students' knowledge and changing instructional method from surface approach to deep approach on teaching and learning.

Keywords: Learning Outcomes; Learning Objectives; Surface Learning; Deep Learning

1. Introduction

Engineering Accreditation Council (EAC) has emphasized that outcome-based education (OBE) learning approach is to be adopted in conducting engineering programmes in Malaysia [1]. The Programme Educational Objectives (PEO) that address institutional and programme mission statements and responsive to the interests of various groups of program stakeholders at the foundation upon which the Programme Learning Outcomes (PO) and Course Outcomes (CO) for the Bachelor of Engineering programme is developed. The formulation of PEO is consistent with the mission and vision of the university and faculty, and they are also intended satisfy the needs of the stakeholders as shown in Figure 1. PEO outline the expected abilities of graduates after their graduation.

In view of OBE, it is of prime importance that related information and activities be communicated and understood by all academic, supporting staff, as well as students [2]. Faculty or school administrators come up with a policy or guidelines underlying the teaching and learning activities in relation to OBE. However, the common comments from stakeholders such as graduate students have a lack of basic knowledge and difficult to integrate knowledge they have learned to solve engineering problems should be reviewed. Therefore, comprehensive curriculum content should be redesigned and planned to exploit the students' minds and effectively develop them into multi-skilled professional for successful future.

Currently, the most pragmatic approach in education evaluation is to focus on students'

perspectives of their experience with a learning programme. Feedback from the students is essential to the creation of a learning environment. Students are more likely enjoy their tasks and want to become even more involved. However, this is invaluable device as a subjective activity which only as valid as the perception of that observer. This paper is prepared to evaluate the meaningful of learning outcomes from the students' perspectives on their process of learning.

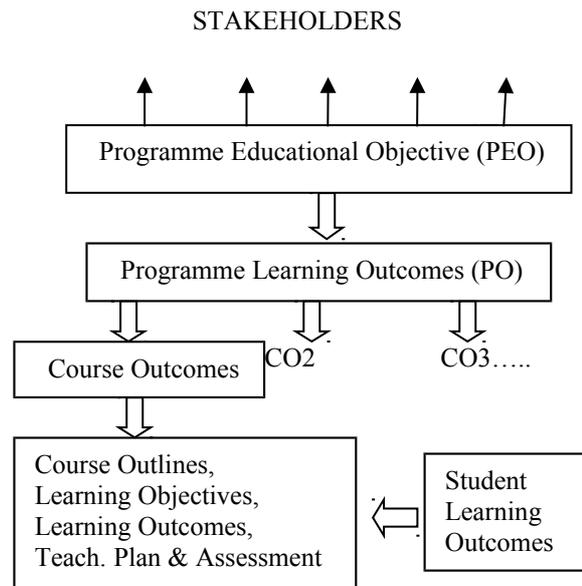


Figure1. Framework of development programme learning outcomes

2. The needs of effective learning outcomes

2.1 Definition

As stated in Malaysian Qualification Agency (MQA) November 2007, learning outcomes are statements that explain what students should know, understand and can do upon the completion of a period of study. Learning outcomes are references for standard and quality as well as for the development of curriculum in terms of teaching and learning. While, learning objectives describe the intended purposes and expected results of teaching activities and establish the foundation for assessment.

As a whole, the objectives regulate the teaching and learning. Learning outcomes are viewed as benchmarks in identifying and evaluating the intended education aspirations for balanced and excellent graduates. Therefore, objectives and learning outcomes need to be developed for courses of study and for each subject in the courses of study.

The purposes of learning outcomes are as follows,

- (i) They inform students of what knowledge and skills they will gain through a course or a program of study.
- (ii) They map the relationships between courses, programs of study and degrees.
- (iii) They map the development of knowledge and skills at each level of curricula.
- (iv) They communicate standards of performance.
- (v) They provide a structure for evaluating teaching and learning.
- (vi) They inform curriculum design and pedagogic practice.

2.2 The benefits of learning outcomes

The benefits of learning outcomes are the emphasis on “students and learning” and the attainment thereof and not only on how they are achieved. Ruhland and Brewer (2001) argue that learning outcomes should not only demonstrate what students know, but should also capture the changes that occur in their cognitive and affective development as a result of their college experiences [7]. Therefore, a good of learning outcomes requires considerable understanding of how to best relate the course content to our types of students and how to make the course meaningful to our student needs and life experiences.

In order to achieve the comprehensive curriculum content, developing effective learning outcomes becomes a tool to systematically reflect on teaching and give our course a coherent structure. While an effective student learning outcomes do not exist in a vacuum. Why students

learn has not changed, nor does it seem likely to; students learn primarily to pass the exam and graduate.

2.3 The 3-P Model of Learning (Biggs, 1989)

Figure 2 shows a schematic diagram of Presage-Process-Product (3-P) model developed by John Biggs in 1989 described that learning outcomes are a result of the interactions of the teaching and learning context with the student approaches to learning. Both student and teaching presage factors interact to produce an approach to learning, which produces its characteristic outcome. The generic aim of good teaching is precisely to encourage students to adopt a deep approach and to discourage the use of surface approach. The heart of the teaching and learning system is at the process level, where the learning-focused activities produces or does not produce the desired outcomes.

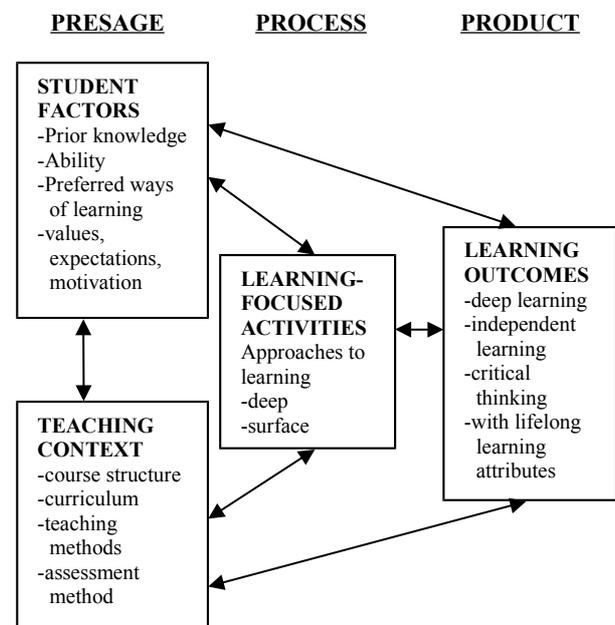


Figure 2. Biggs' 3-P Model of teaching and learning

The combination of 3P's model explained what learning is about. It involves the interaction of the student and teaching context to produce a particular approach to learning, either deep or surface, which affects the quality of learning outcomes. As Shuell [8] stated on outcomes;

'If students are to learn desired outcomes in a reasonably effective manner, then the teacher's fundamental task is to get students to engage in learning activities that are likely to result in their achieving those outcomes. It is important that what the student does is more important than what the teacher does.'

Emerging teachers need to understand that not all students will be equal in their levels of creativity and should always scaffold and push their students to the next level. They should also provide many opportunities for students to showcase their creativity by creating artwork or simply coming up with new ways to solve a problem.

3. Methodology of the study

The survey was carried out on 185 students from one of the engineering programmes in the Universiti Teknologi Malaysia. The respondents are selected from all years of study. Questionnaires are designed and distributed to the students. The survey consists of three (3) constructs. A 5-point Likert scale as rating indicators was used in the survey form to measure the respondent's strength of agreement. A Likert score of 1 indicated that the respondent strongly disagree that learning outcomes are very importance in learning. A Likert score of 3 indicated a "Not sure" position, and a Likert score of 5 indicated a "Strongly agree" that understanding the learning outcomes are very importance.

The constructs are as followed:

1. Do the students feel that learning outcomes are very important on learning?
2. Are the learning outcomes very meaningful on their learning?
3. Are the lecturers concerned with the importance of learning outcomes in their teaching?

4. Result and Analysis

The discussion in this paper is divided into two sections: respondents' profile; and the students' perspective on the learning outcomes.

3.1 Respondents' profile

Table 1 shows the distribution of respondents according to gender from difference years of study. One section of students is selected from each year of study. In term of gender, 53.5% of the respondents are male and the rest are female. Figure 3 shows the distribution of the respondents according to races which Malay students are about 66% of the respondents.

Table 1 Number of Respondents According to Gender

	Male	Female	Total
1 st year	18	21	39
2 nd year	25	19	44
3 rd year	21	24	45
4 th year	35	22	57

Total number of respondents	185
-----------------------------	-----

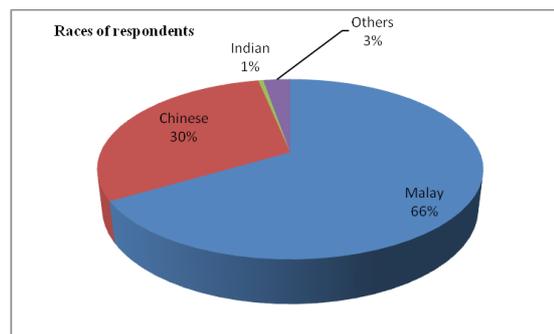


Figure 3. Distribution of respondents according to races.

3.2 Survey questions

The results of all constructs from survey questions are divided into two parts, which are;

- (i) Distribution of the average percentage of students' agreement
- (ii) Mean score of students' perception based on different year of study. A mean score greater than 3 signify a positive response, while a mean score that is less than 3 denotes a negative one.

Construct 1: Do the students feel that learning outcomes are very important on learning?

Figure 4 shows the distribution of the feedback on their perception of construct 1. Referring to the distribution, more than 60% of students agreed that the learning outcomes are very important on teaching and learning. However, about 28% of the students are not sure and another 6% disagree or strongly disagree.

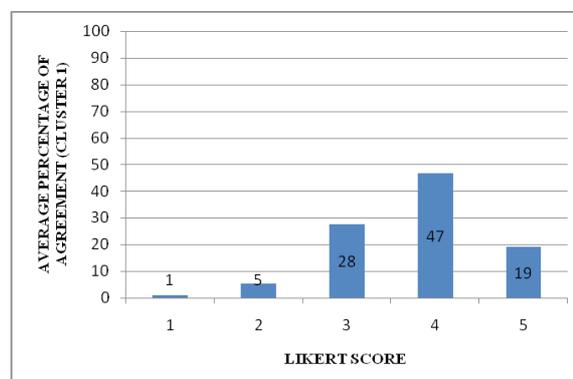


Figure 4. Distribution of Average Percentage of Student's Agreement for Construct 1

Referring to Figure 5, it is clearly indicated that there is a significant of difference on the perception of students on the importance of learning outcomes

between the years of study. The first year students show the highest mean values of agreement which is 3.87. However, the mean value of the Likert score shows the reduction at the following year of study where for fourth year students the mean values of likert score is only 3.67. This means that learning outcomes becomes less important on their learning when students are in the upper years.

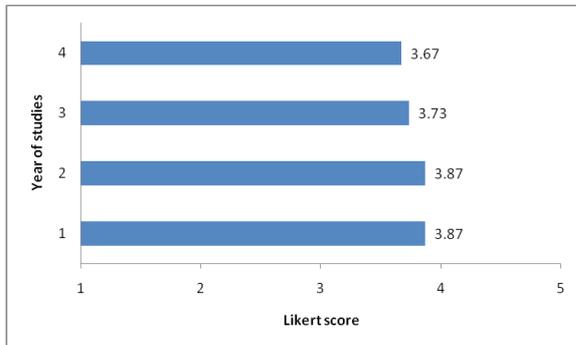


Figure 5. Construct 1 - Mean value of Likert Score between the years of study.

Construct 2: Are the learning outcomes very meaningful on their learning?

The purpose of construct 2 is to find out the students' perception on the meaningful of learning outcomes on their learning process. Figure 6 shows the distribution of average percentage of students' agreement on construct 2. It shows that 72% students agreed that learning outcomes are very meaningful for them to understand the courses and only 5% of the respondents stated disagree and strongly disagree.

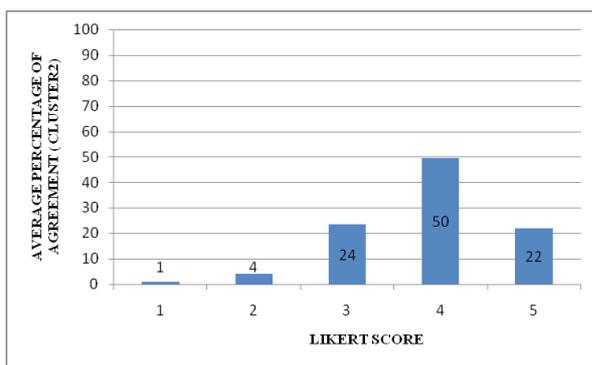


Figure 6. Distribution of Average Percentage of Student's Agreement for Construct 2

Figure 7 shows that for the first, second and third year students the mean values of Likert score (range from 3.93 to 4.00) shows that they agree with construct 2. However, referring to the result of fourth year students, the mean value of this cluster is about 3.73. This result indicated that from the students' perception, the learning outcomes are less

meaningful on their learning compared to the earlier years.

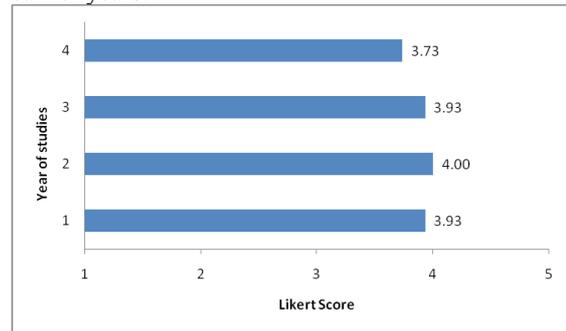


Figure 7. Construct 2 - Mean value of Likert Score between the years of study.

Construct 3: Are the lecturers concerned with the importance of learning outcomes in their teaching?

The purpose of construct 3 is to find out the perception of students on whether their lecturers are concerned about the importance of learning outcomes on their teaching. Figure 8 shows the distribution of average percentage of students' agreement on construct 3. It shows that only 64% of students agreed that the lecturers are concerned with the importance of learning outcomes in their teaching. However, 27 % of the students were not sure about it and less than 9% totally disagree.

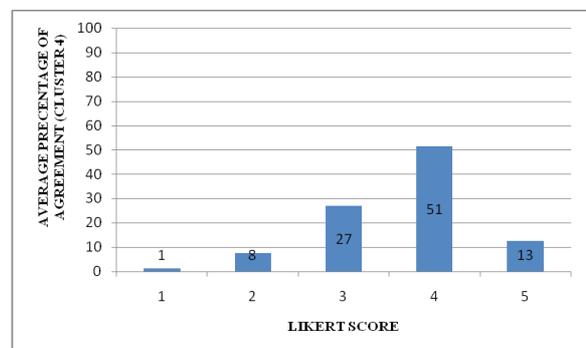


Figure 8. Distribution of Average Percentage of Student's Agreement for Construct 3

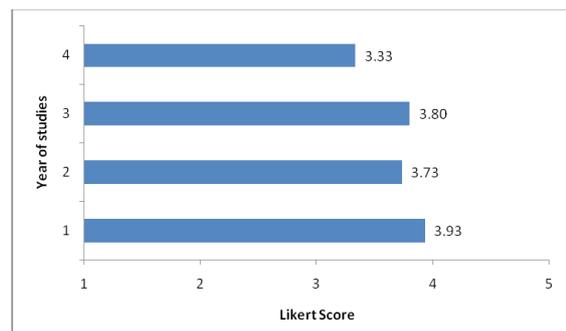


Figure 9. Construct 3 - Mean value of Likert Score between the years of study.

As can be seen in Figure 9, the first year students again achieved the highest mean value (3.93) compared to the fourth year students that indicate the lowest mean value which is only 3.33.

5. Discussions and Recommendations

Based on the survey of students, we found that the effectiveness of learning outcomes and objectives are not clearly understood by the students. Results shows that more than 20% of the students were not sure and disagree with the positive questions related to the issues of learning outcomes.

As a recommendation, lecturers should switch their teaching style paradigm from surface approach to deep approach. It could noticed that students who utilise a deep approach are considered to be intrinsically motivated about learning and tend to look for or create meaning out of new information as a means of integrating it with their prior knowledge of understanding of the world. This is why students who use the surface approach can have a good result based on memorising and regurgitation with temporary knowledge. To overcome this problem, problem-based learning (PBL) as a student-centred instructional method is recommended, which students collaboratively solve problems and reflect on their experiences.

As lecturers, we are required to take students' perspectives and made realistic estimation of what students are supposed to do by the end of the course. Therefore, we should be more focused in our planning and developing a system that aligns intended learning outcomes with appropriate assessment measures and instructional activities.

On the other hand, students should be made to realise and aware of the importance of learning outcomes. By knowing the outcomes they know what they are learning and what they should get after completing the courses or programme. By engaging students and lead them to be successful in their endeavours, they are more likely enjoy their tasks and want to become even more involved.

As a recommendation, faculty should revise the content of curriculum by introducing new courses which integrate student knowledge and changing instructional method from surface approach to deep approach on teaching and learning at the first year of study.

6. Conclusion

Students' perspectives can be one of the important tools to assess the quality of teaching and learning. By providing a good learning objectives, learning outcomes and valuable assessment method, it doesn't mean that students can use and

integrate the knowledge after they graduate if they are only exposed to surface learning. It is our responsibility as a teacher to encourage the development of quality learning outcomes in our students, such as deep approaches to learning, understanding, independent learning, critical and creative thinking, problem solving and other lifelong learning attributes.

From the study, it is clear to answer the comments which stated by the stakeholders. As a result, all important components which contribute to teaching and learning should have an effort to develop their skills and knowledge before we can produce quality of graduates.

Acknowledgements

I would like to thank all the respondents for their willingness and spend time to participate in this study.

References

1. Engineering Accreditation Council (2007). Engineering Programme Accreditation Manual 2007, Board of Engineers Malaysia.
2. Marie J. Lindhorst and Janet K. Schulenlenberg, Defining and Measuring Student Learning Outcomes, Fifth Annual Professional Development Conference on Academic Advising, University Park, PA September 27-28, 2006.
3. Patricia A. March, What is Known about Student Learning Outcomes and How does it relate to the Scholarship of Teaching and Learning?, International Journal for The Scholarship of Teaching and Learning, Vol.1, No. 2, July 2007.
4. M. Thomas, Y. Beauchamp, Y.A. Youssef, J. Masounave, An experimental design for surface roughness and built-up edge formation in lathe dry (3) (1997) 167–180.
5. Garrison, D.R., Andrews, J. & Magnusson, K., Approaches to teaching and learning in higher education. New Currents, 2.1. Retrieved July 18, 2003, from <http://www.ucalgary.ca/pubs/Newsletters/CURRENTS/Vol.2.1/approaches.html>
6. Biggs, J.B., Kember, D., & Leung, D.Y.P. (2001), The Revised Two Factor Study Process Questionnaire: R-SPQ-2P. British Journal of Educational Psychology. 71, 133-149.
7. Ruhland, S.K., & Brewer, J.A. (2001) Implementing an assessment plan to document student learning in a two-year technical college. Journal of Vocational Education Research, 26, 141-171.

8. Shuell, T.J. (1986), Cognitive conceptions of learning. *Review of Educational Research*, 56, 411-436.