

Assessment of Program Educational Objectives Using Alumni Survey: The UMS Experience

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Abstract—Outcome Based Education (OBE) is as an educational process which is based on trying to achieve certain specified outcomes in terms of individual student learning. The OBE assessment includes three types of outcomes/objectives: the Course Outcomes (CO), the Program Outcomes (PO) and the Program Educational Objectives (PEO). The PEO is being assessed after three to five years of their graduation date and indicate the achievements of program graduates in their career and professional life after graduation. In this study, two sets of PEOs were used to survey two different groups of graduates; using the Likert's scale and achievement indicators respectively. The achievement indicators were developed by the program using stakeholders' inputs. It was found that the average Likert's point indicates a satisfactory level of achievement and the second survey showed that the older batch closely matched the targeted PEO performance compared to the newer ones. In conclusion, while Likert-scale method produces favorable results, the real achievement may not be accurate due to its' dependency to the precise research question being asked, possible response bias and temporal right-censoring. On the other hand, the direct indicator-achievement method produces measurable and clear outcomes. The better performance of older batch may indicate a span of time trend where working experience plays important role in PEO achievement.

Keywords—Outcome-based Education; Engineering Education; Engineering Accreditation; Program Assessment; Program Educational Objectives

I. INTRODUCTION

Beginning 2004, for an engineering degree to be accredited by the Engineering Accreditation Council (EAC) – the body responsible for all engineering programs in Malaysia, the offering institution is required to implement the Outcome-Based Educational or the OBE system [1]. The OBE is as an educational process which is based on trying to achieve certain specified outcomes in terms of individual student learning. Thus, having decided what are the key things students should understand and be able to do or the qualities they should develop, both structures and

curricula are designed to achieve those capabilities or qualities. The designing process involves restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than accumulation of course credits.

In general, the OBE assessment includes three types of outcomes/objective: the Course Outcomes (CO) – being assessed during semester, the Program Outcomes (PO) – being assessed at the end of their four-year study and the Program Educational Objectives (PEO) – being assessed after 3-5 years of their graduation date. The PEO are specific goals consistent with the mission and vision of the institution of higher learning, and are responsive to the expressed interest of programme stakeholders describing expected achievements of graduates in their career and professional life after graduation. Criteria of good PEOs are such as distinctive, specific, measurable, achievable, result oriented, and having a time frame [2].

The PEO of the Civil Engineering Program for batch 2005 are shown in Table I. They included fundamental knowledge, technical skills, interpersonal skills, professional and ethical responsibility and lifelong learning.

TABLE I.
PROGRAM EDUCATIONAL OBJECTIVES FOR BATCH 2005

No	Program Educational Objectives
1	Fundamental Knowledge
2	Technical Skills
3	Interpersonal Skills
4	Professional and Ethical Responsibility
5	Lifelong Learning

The PEOs should have clear link to the PO and curriculum design. OBE requires an engineering program to answer the important question: What do you want the students and alumni to have or able to do? The

question is to be answered by the university, school, head of program, individual lecturers, future employers, parents, and the student themselves. This group is also known as the stakeholders.

The PEOs reflect the stakeholders' expectation that the graduates should;

- Have a broad knowledge of fundamental of principles of mathematics, science and civil engineering.
- Have the ability to apply the knowledge in engineering disciplines to identify, formulate and to find the solution of engineering problems.
- Have the ability to communicate effectively, to work as member of multidisciplinary teams and ability to assume leadership roles.
- Have an understanding of responsibility to the profession and the ability to act professionally and ethically if encountered issues of safety, discrimination, fairness and honesty.
- Be prepared to continue professional development based on awareness of professional society activities, professional licensure requirements, and opportunities for further education in postgraduate levels.

As per requested by the EAC, the CQI process was conducted after the first cycle and yielded an improved set of PEO shown in Table II. These new sets of PEO were assessed directly using the matched indicators.

TABLE II.
NEW PROGRAM EDUCATIONAL OBJECTIVES AND ACHIEVEMENT INDICATORS

No	PEO	Achievement Indicators
1	Professional & Ethical Responsibility	Job Relevance, Position held, Salary range, Professional membership, Roles in community
2	Interpersonal Skill	Public speaking/no of talks/ briefing/ meeting, publication/writing, Position held
3	Continual Professional Development (CPD)	Percentage of graduate doing masters course, CDP / Short courses

The evaluation of PEO achievement could be of different methods; i) through linking the PO to PEO (this is done by assessment of CO), ii) through survey of companies who employs the graduate and iii) through direct survey of the alumni. The last two methods have been practiced extensively in most public universities. The Civil Engineering and Structural Department of Universiti Kebangsaan Malaysia (UKM) for example conducted a survey in Mei 2004 and yielded 42% responses [3]. Similar exercises are also common in other oversea institution of higher learning, for example the University of Washington [4].

This paper shares the experience of the Civil Engineering Program in Universiti Malaysia Sabah

(UMS) in assessing the PEO using Alumni Survey method.

II. RESEARCH METHODOLOGY

The main data were obtained from two surveys conducted in 2008 and 2010. The first survey targeted the graduate batch 2005, and the second targeted the batch 2006-2009.

The use of alumni survey as a data collection method for empirical studies of PEO achievement is relatively new phenomenon. The questionnaires requesting alumni to rank their PEO achievement using the Likert-type scale between (1) = poorly achieved to (5) = fully achieved. An average of (3 = satisfactorily achieved) is considered achievement of that particular PEO.

For the second round of survey targeting batch 2006-2009, the achievements of the alumni were assessed based on percentage of achievement indicators suggested by the program stakeholders.

III. RESULT AND DISCUSSION

Table III shows the percentage of responses by batches. The addresses were obtained through students files. The percentages were ranging from 40% to 80%.

TABLE III.
PERCENTAGE OF RESPONSES BY BATCH

	Batch				
	2005	2006	2007	2008	2009
No of form	30	12	15	5	12
No of response	24	8	13	2	7
% Response	80.0	66.7	86.7	40.0	58.3

The Likert's points were than tabulated and the average point of the PEO is as shown in Fig. 1. Based on the figure, it was found that all of the PEOs averaged above 3.00, indicating that they are satisfactorily achieved by the Batch 2005 alumni within 3 years of graduating date. The main question arises was whether the results are an accurate representation of the alumni real achievement or merely their level of opinion on the importance of the particular PEOs.

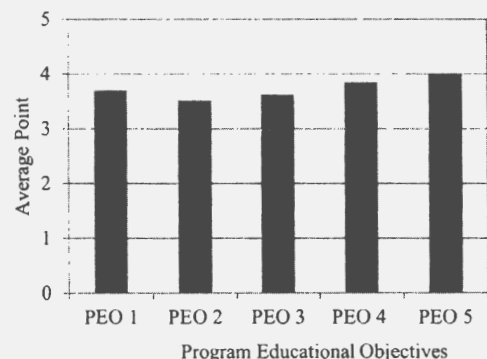


Figure 1 PEO achievement of batch 2005 alumni

The drawbacks commonly associated with using this Likert-type alumni survey as a research methodology are the dependency to the precise research question being asked, possible response bias and temporal right-censoring [5]. To address the drawbacks, the stakeholders suggested the program to balance the alumni survey data with measurable achievement indicators.

The indicators assigned for PEO 1: Professional & Ethical Responsibility are; job relevance, position held, salary range, professional membership and roles in community. The indicators for PEO 2: Interpersonal Skill are; public speaking records, number of publication or writing and position held. The indicators for PEO 3: Continual Professional Development (CPD) are; percentage of graduate doing masters course and CDP hours.

Fig. 2 until Fig. 6 shows the percentages of selected indicators for graduate batch 2006-2009 based on the second survey analysis.

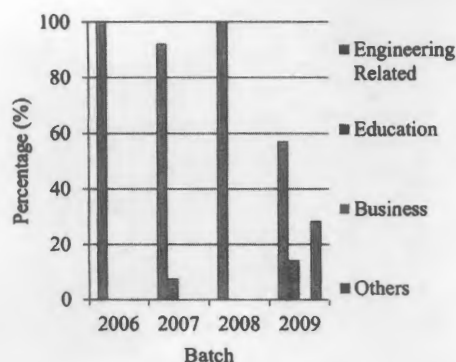


Figure 2. Percentage of job relevance by batch

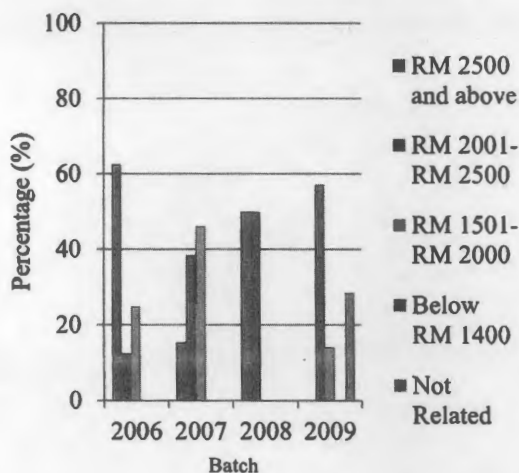


Figure 3 Percentage of salary range by batch

The five related achievement indicators of PEO 1 are shown in Fig. 2, Fig. 3, Fig. 4, Fig. 5 and Fig. 6. Except for continual professional development (0%), the oldest batch (2006) performs relatively well in almost all

indicators include job relevance (100%), membership in professional bodies (100%), salary range (62.5%) and position held (100%). Contrary, the newest batch (2009) shows lowest achievement indicators in job relevance (57.1%), salary range (57.1%) and position held (42.8%).

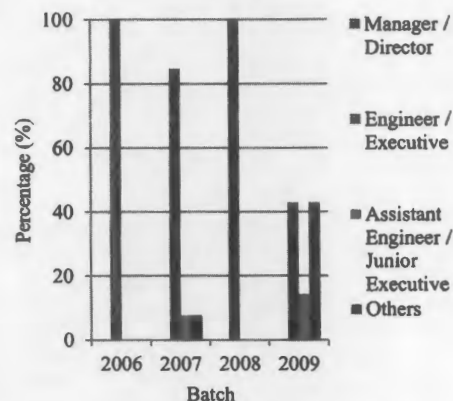


Figure 4. Percentage of position held by batch

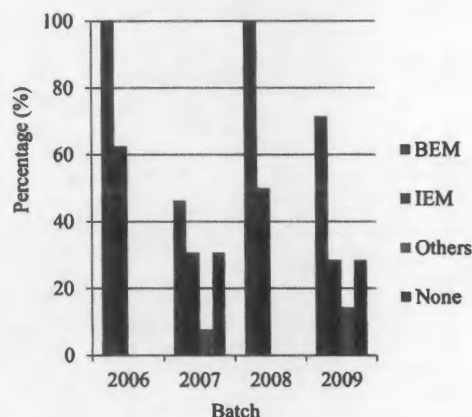


Figure 5. Percentage of professional body membership by batch

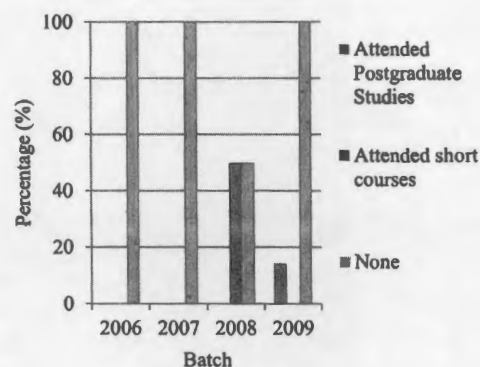


Figure 6. Percentage of graduate attending postgraduate studies or short courses

The related achievement indicator for PEO 2 is the position held. Similar trend as in PEO 1 is observed

where while 100% of batch 2006 alumni are currently working in executive position, about 42.86% of batch 2009 alumni is still holding lower junior executive position.

Fig.6 which shows the achievement indicator of PEO 3 however yielded unfavorable results for all batches. Except for batch 2009 (14.3% attended postgraduate study), all the other batches recorded 0% enrollment in any masters-level courses.

In overall, batch 2006 closely matches the targeted performance set by the stakeholders. This is followed by batch 2007, batch 2008 and batch 2009 respectively. Since the survey was conducted in 2010, the projected trajectory seems promising. The program however noticed that much work needs to be done in order to achieve PEO 3. Among the conducted measures include recurring talks from the School of Postgraduate Studies, UMS to encourage postgraduate enrollment and promotional of scholarship availability.

IV. CONCLUSION

As a conclusion, the two different surveys offer stark differences. While the indirect Likert-scale method produces favorable results compared to the direct indicator-achievement method, the real achievement may not be accurate due to its' dependency to the precise research question being asked, possible response bias and temporal right-censoring. On the other hand, the direct indicator-achievement method produces measurable and clear outcomes. This method is also useful for the program during CQI process as it shows the specific weaknesses which the program can quickly address upon analysis.

When comparing each batch, it was found that the PEO achievement of older batch is generally better than the newer ones. This attributed to the span of time between their graduations to the survey date. Evidently, experience plays important role in most of the achievement indicators; hence the stipulated time set by the EAC for PEOs to be achieved is between 3-5 years.

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