



Programme Outcomes Assessment in OBE Implementation: On-line Evaluation System

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ABSTRACT

The move towards Outcome Based Education (OBE) approach for the diploma programmes at the Faculty of Civil Engineering for the whole system of Universiti Teknologi MARA commenced upon receiving the directives from the Faculty of Civil Engineering, UiTM Malaysia. One of the OBE concepts in OBE-curriculum is the programme outcome assessment and evaluation. The Civil Engineering diploma programmes has gone through the assessment programme for their first graduates in June 2009. However, the actual process of this assessment had started in 2007. The assessment and evaluation were done manually by distributing questionnaires to graduating students. However, this method has created problems that are related to time, resources and cost. Not only this process took about two months to produce results, but the process of gathering the data, analysing the data and producing the results has proven to be tedious. The logistic aspect also contributes to the difficulties in carrying out this bi-annual assessment for all campuses in the country. At present, the Faculty of Civil Engineering is the only faculty involved with the exercise. Current development shows that, other faculties will implement the OBE curricular in 2010. Thus, the assessment will be done in a larger scale and may result in complexities. Notwithstanding the complexity of the process, the assessment and evaluation need to be carried out as evidences have to be documented for accreditation purposes. Thus, a more systematic method of assessing and evaluating needs to be developed. This innovation proposes an electronic solution for programme outcome assessment to support the requirement needed in OBE implementation. The system can help in managing data and minimising the use of resources such as paper and support staff for data entry and analysis. It is also able to provide sufficient, reliable and fast results which can be used as performance criteria at the continual quality improvement (CQI) level.

Keywords: *assessment, on-line evaluation, programme outcomes*

Introduction

Quality assurance has transformed higher education scenario at all levels. The movement is very vital to ensure graduates' survival in an increasingly competitive world market. The changes require key players in higher education to re-engineer all levels of programme implementation. This element is now essential for accreditation at Institution of Higher Learning (IHL) for all programmes, be it a degree or non degree programme. Transformation of higher education is done to meet needs of the globalised and diversified economy and to remain globally competitive (Sharifah Hapsah, 2007). Consequently, MQA Act has been approved by the Malaysian parliament

in June 2007 to implement the Malaysian Qualifications Framework (MQF), accreditation of IHL programmes, qualifications, supervision and regulation of the quality and standards of IHL providers, and Malaysian Qualifications Register (Sharifah Hapsah, 2007). Focusing on the regulated act, IHL is convinced to implement Outcome-based Education (OBE).

OBE is an educational philosophy that states education ought to be aimed at producing particular educational outcomes, which give students a particular, minimum level knowledge and abilities. OBE requires programmes to be implemented in one close loop cycle, beginning with planning, implementation, assessment and Continual Quality Improvement (CQI) as shown in Figure 1. This practice programme owners to develop self-assessment. Self-assessment gives the outlook on progress and setback during programme implementation to meet these requirements:

- i. provide evidence how the need for stakeholders are met
- ii. able to exhibit how programme objective (PeO) and be programme outcome (PO) is to be achieved
- iii. able to demonstrate the CQI

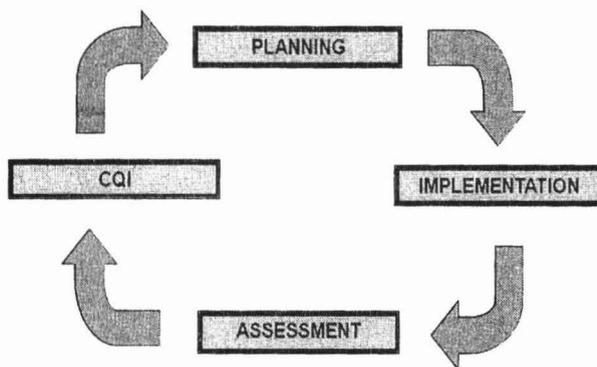


Figure 1. OBE's Programme Implementation

Programme Assessment

Assessment is a must in OBE practice. In this practice, the owners themselves should be able to conduct series of evaluating system to prove to auditors for accreditation and stakeholders such as employer, alumni, parents, graduates and other parties concerned the credibility of their programmes. In OBE approach, assessment is very important to make sure the Programme Objectives (PeO), Programme Outcome (POs) and implementation strategies are inter-related in fulfilling the institution's mission. In order to assess and evaluate the programme, the performance criteria must be measurable. It could be categorised into three elements which are knowledge (K), skills (S) and attitude (A). The instructor or lecturer must design activities that include these three elements or at least two elements as shown in Figure 2. In a programme, these three elements must be distributed in all courses.

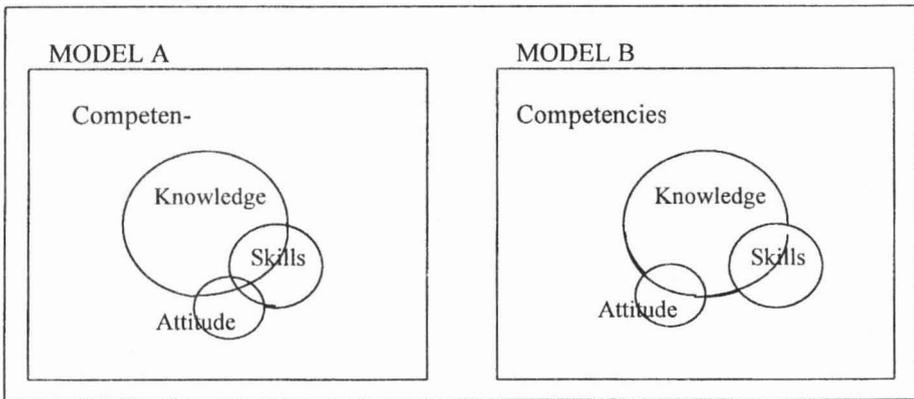


Figure 2. Activity Designed by Elements (Megat Johari, 2008)

All performance criteria that are being measured must be assessed and documented. Assessment will give a clear picture in measuring student learning outcomes in this design in systematic and valid manner. Assessment will provide and prepare data for evaluation of achievement of programme outcomes or educational objectives. Evaluation process interprets all the data and evidence from the assessment practices to determine the programme outcomes are achieved. This process will provide critical information to faculty and administrators on the effectiveness of the design delivery and direction of an education program for Continual Quality Improvement (CQI). Continual Quality Improvement (CQI) is a cyclical process. The quality improvement comes from within the institution. It requires integration of defined objectives, performance metrics and regular assessment. Synchronise between educational objectives; mission of institution and needs of stakeholders is essential to achieve the Continual Quality Improvement (CQI). All the processes above are summarized in Figure 3.

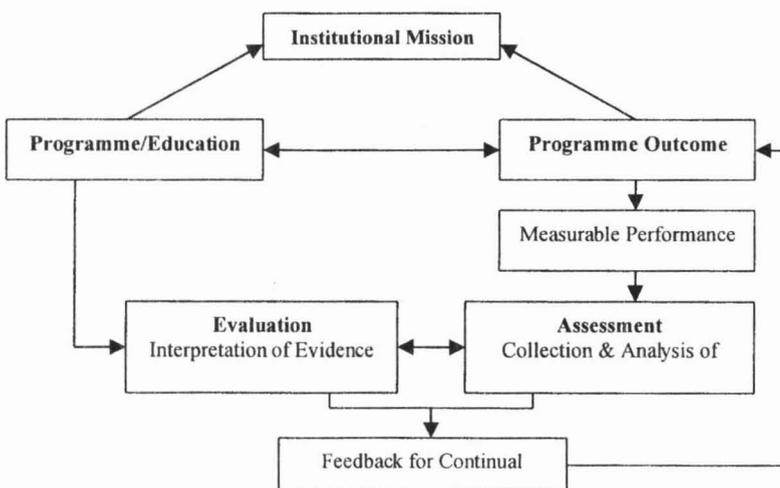


Figure 3. Assessment of Continual Quality Improvement

Programme Outcome

One of the requirements needed by accreditors from MQA is the establishment of learning outcome / programme outcome (PO) and the programme design. PO is a statement that describes what students are expected to know or able to do by the time of graduation (Abet Criteria, 2004). PO statements that are used in this paper are described as:

- i. ability to acquire and apply knowledge of science and engineering fundamentals
- ii. acquiring in-depth technical competence in a specific engineering discipline
- iii. ability to undertake problem identification, formulation and solution.
- iv. ability to utilise systems approach to design and evaluate operational performance
- v. understanding of the principles of sustainable design and development
- vi. understanding of professional and ethical responsibilities and commitment
- vii. ability to communicate effectively, not only with engineers but also with the community at large.
- viii. ability to function effectively as an individual and in a group.
- ix. ability to function effectively as a leader or manager as well as an effective team member.
- x. understanding of the social, cultural, global and environmental responsibilities of a professional engineer and the need for sustainable development.
- xi. recognising the need to undertake life-long learning and possessing/ acquiring the capacity to do so.
- xii. ability to design and conduct experiment as well as to analyze and interpret data
- xiii. having the knowledge of contemporary issues.

Programme Assessment in Diploma of Civil Engineering (EC110)

The Civil Engineering diploma programmes has gone through the assessment programme for their first batch of graduates that had gone through the OBE approach in June 2009. However, the actual process of the assessment had started in 2007. The assessment and evaluation were done manually by distributing questionnaires to graduating students. However, this method has created problems that are related to time, resources and cost. Not only this process took about two months to produce results, but the process of gathering the data, analysing the data and producing the results has proven to be tedious. The logistic aspect also contributes to the difficulties in carrying out this bi-annual assessment for all campuses in the country. At present, the Faculty of Civil Engineering is the only faculty involved with the exercise. However, current development shows that, other faculties will implement the OBE curricular in 2010. Thus, the assessment will be done in a larger scale and may result in complexities. Notwithstanding the complexity of the process, the assessment and evaluation need to be carried out as evidences have to be documented for accreditation purposes. Thus, a more systematic method of assessing and evaluating needs to be developed. This innovation proposes an electronic solution for programme outcome assessment to support the requirement needed in OBE implementation. The system can help in managing data and minimising the use of resources such as paper and support staff for data entry and analysis. It is also able to provide sufficient, reliable and fast results which can be used as performance criteria at the continual quality improvement (CQI) level.

A Solution for Programme Outcome Assessment

As mentioned earlier, the process of assessing and evaluating the programme outcome manually can be problematic in terms of time, resources and cost. Thus, a solution that can resolve these problems has been identified. Basing the solution on these parameters, the writers propose: a) a new framework of programme outcome assessment and evaluation to replace the manual procedure, and b) an on-line evaluation system that can reduce the problem areas identified above.

An on-line evaluation system for the purpose of programme outcome and assessment has been developed. The preliminary process of the system development involved gathering information on the problems that occurred during the manual process and feedback from the users. The next steps were to identify the software that can be used to develop the system and a framework for the process development. However, it is very important to note this on-line system is still at the infant stage, thus, a complete cycle of the process development is yet to achieve. This paper, therefore, only describes the system requirement, the process development and the expected output of the system.

On-line Evaluation System

This system uses the client-server concept of technology. It can be accessed within and outside the organisation. This allows both multiple users and administrators to use the system at any place, at any time. Figure 4 shows a graphic illustration of the concept.

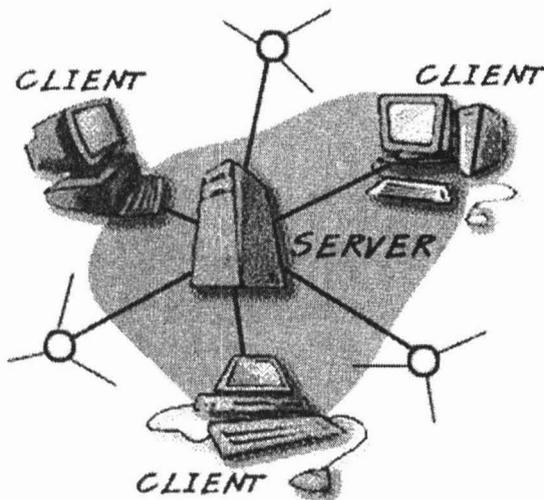


Figure 4. Client-Server Concept of Technology

System Requirement

The system uses the XAMPP software which is an open source software that is available for free. The system employs PHP as the programming language, HTML as an interface and MySQL as the database.

Process Development

The System Development Life Cycle (SDLC) has been used as one of the methodologies to develop the system. This SDLC involves five phases. Phase 1, *Planning*, is the most important part where users' requirements are gathered. These requirements can be obtained by examining related documentation and users' perceptions based on survey. Phase 2, *Analysis*, involves analysing all the data gathered based on the problems occurred that have instigated the development of the system. Phase 3, *Development*, is where the system is constructed. Phase 4, *Implementation*, is the installment of the system in other computers. Reviewing of any problems that occurred during the usage of the system is also carried out in this implementation phase. In Phase 5, *Maintenance*, the system is not only maintained, but also enhanced for future consideration.

Users' Scope

The users for this system are students and administrator. Both of these users have different scope of usage. Students can only view and update their personal information and answer the questionnaires for the programme outcome assessment purposes. Administrator, on the other hand, has a wider usage of the system. This includes adding and deleting students' information, updating the questionnaires and also generating report for the assessment. The following Table 1 illustrates the users' involved and their scope in the system.

Table 1. User's Scope

Student	Administrator
View personal information	Add student
Update personal information	Update students' personal information
Answer questionnaires	Delete students' personal information
	Add semester
	Update semester
	Add / update questionnaire
	View statistics
	Print Statistics

System Output

As the final output, the system will be able to generate reports from the students' response to the questionnaire. The reports will be generated in terms of mean score for each question. Reports for the means can also be generated in the forms of graphs or charts.

Conclusion

The development of the web-based assessment system can greatly support the requirement needed in the OBE implementation. The system can help managing the large data systematically and with accuracy. In addition, the system can help in managing data and minimising the use of resources such as paper and support staff for data entry and analysis. It is also able to provide sufficient, reliable and fast results which can be used as performance criteria at the continual quality improvement (CQI) level.

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