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A Model of Outcome-Based Education (OBE) for Engineering

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ABSTRACT

Outcome-Based Education (OBE) is an educational system which has been enforced on all engineering programmes. The driving force for this change is the current higher learning education development, which is an accreditation regulatory in the Malaysian Qualification Agency (MQA) Act. Shifting towards this new practice, the concept and delivery of OBE should first be recognised by any Institution of Higher Learning (IHL) provider for accreditation purposes. This paper focuses on the driving force and an implementation model of OBE practices in the Faculty of Civil Engineering (FCE) UiTM Pahang.

Keywords: *engineering education, Faculty of Civil Engineering (FCE) UiTM Pahang, Outcome-Based Education (OBE)*

Introduction

The current development on the issue of quality assurance brings about the re-engineering of programme implementation at all levels in higher education. As quality assurance is merely vital to ensure survival in an increasingly competitive world market, this element is now essential in the accreditation exercise in Institution of Higher Learning (IHL) for all programmes, degree or non-degree.

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The transformation in higher education is made to meet the needs of the globalised and diversified economy and to remain globally competitive. The Malaysian Qualification Agency (MQA) Act has been approved by the parliament in June 2007. The act includes the implementation of 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. Focusing on the regulated act, IHL is required to implement Outcome-Based Education (OBE). The main implementation of OBE is to ensure that accreditation practices in Malaysia meet the practices by the international accreditation accords.

OBE means clearly focusing on and organising everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences (Spady, 1994). This new approach, which is not conventional and to understanding OBE with wisdom within, will rest on the shoulder of IHL shareholders. The main concern of this paper is to focus on the emergence of the OBE concerning the driving force and implementation of OBE in engineering education.

Driving Force in Engineering Programme: An Overview

Malaysia was admitted to the Washington Accord through Engineering Accreditation Council (EAC) as a provisional member in 2003. The Washington Accord is a multinational agreement which recognises the substantial equivalency of engineering degree programmes accredited by the responsible bodies in each of the signatory countries (Basri, 2004).

The need for a genuine shift within the engineering education system from the conventional system towards OBE system is the most significant requirement that became clear from Malaysia's Washington Accord application. Prior to this, educational elements based on objectives and outcomes for continuous program improvement are mentioned in at least two regulatory documents; Engineering Accreditation Council (EAC) Manual and the Code of Practice for Quality Assurance (Ministry of Higher Education Malaysia) (Basri, 2004).

Apart from meeting the above regulatory requirements, it is clear that by initiating and sustaining a genuine shift towards OBE, the engineering programmes can anticipate real benefits and improvement, including resulting in a more directed and coherent curriculum, producing

graduates with attributes more relevant to industries, stakeholders and achieving Continuous Quality Improvements (CQI) as an evitable consequence (Basri, 2004).

An awareness of these significant benefits should provide a powerful motivating force for engineering faculties to be committed in the OBE implementation. Malaysia's engineering education system will necessarily be driven towards continually improving programmes quality in meeting the Washington Accord requirements. As far as the chronology of event is concerned, the implementing of OBE was first mooted by Engineering Accreditation Council (EAC) in February 2005, and later by MQA in June 2007 for all programmes.

The Need for Accreditation

Prior to 1996, the concern of the higher educational programmes is related to the matters such as the approval of new programmes, funding, and recognition of qualifications for employment and licensing of professionals by the professional bodies. This led to enforcing quality assurance for IHLs. The realisation on the need for a quality assurance body was due to global, regional and local forces which led to the establishment of the Lembaga Akreditasi Negara (LAN). The quality regime began with the establishment of LAN in July 1997 for the purpose of ensuring the quality of education provided by the private higher education institutions (PHEIs) (Zita, 2006).

In 2002 the government decided that public universities must also be subjected to quality assurance and ordered the establishment the Quality Assurance Division (QAD) within the Ministry of Education (now referred to as Ministry of Higher Education). The Quality Assurance Division for public universities was established to set up quality audit system which is institutional and programme-based for the public universities. Its mission is to promote public confidence on the provision and standards of award being safeguarded and enhanced. MQA conduct academic reviews of programme performance outcomes, quality of learning opportunities and institutional capacity and management of standards. The reviews are based on nationally agreed guidelines, criteria and procedures and such reports are made available. MQA have been very involved in developing the Code of Practice for Quality Assurance, programme standards of many disciplines, post graduate standards, procedures, and provide reports of benchmarking outcomes, good practices, training and a National Qualification Framework (MQF) (Zita, 2006).

The Malaysian Qualifications Framework (MQF) was developed by the Quality Assurance Division and LAN in 2002; it was approved in January 2005 by the National Higher Education Council. It also recommended that suitable legal body be established to take charge and implement MQF. In recognition of the issues and challenges in higher education and the role it has to play in nation building, the Cabinet has, on 21 December 2005, made a major decision to establish the Malaysian Qualification Agency (MQA) to be responsible for quality assurance in higher education and to implement the MQF. The MQA will be responsible for quality assurance of institutions and programmes based on agreed criteria and standards that have been set in the MQF and establishing a National Reference Centre for recognition and information of qualifications (Zita, 2006). As far as the accreditation practice is concerned, there are nine (9) aspects to be included in the accreditation exercise. These aspects are:

i. vision, mission and institutional goals, learning outcomes
ii. program design and delivery
iii. student selection and support
iv. student assessment system
v. academic staff
vi. educational resources
vii. program monitoring and review
viii. leadership, governance and administration, and
ix. Total Continuous Quality Improvement (CQI).

OBE offers educational philosophy and practices. When implement OBE, most of the nine aspects delivered for instance, learning outcomes, program design and delivery, student assessment system, program monitoring and review and total Continuous Quality Improvement (CQI).

Obe: Key Traits for Accreditation

As mentioned earlier, OBE means clearly focusing and organising everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. The system contradicts with the traditional method of teaching and learning which we consider as conventional prescriptive-based system. In OBE, the students' programme objectives (PeO) and programme outcomes (PO) were designed in the curriculum and expected

to achieve by the time of graduation. These PeOs and POs are designed not only to anticipate students with adequate technical knowledge, i.e., Civil Engineering, but also the non-technical skills, i.e., communication, work as a team, life long learning, etc. As OBE has not been familiar among our local universities, all signatory members in Washington Accord (WA) have embraced OBE as the appropriate system to train future engineers. The members of WA include Great Britain, Canada, South Africa, USA, Australia, Germany, Japan and Singapore.

Adapting OBE ideally will shift in focus from the curricula, resources and processes towards outcome and objectives. OBE is well explained by three levels of realisation structure:

i. Philosophy / Theory / Broad Perspective
ii. Curricula / Structures / Procedures
iii. Classroom practice (Problem Based Learning (PBL), Creative Learning (CL), Active Learning (AL) etc)

(Basri, 2005)

For each level, a comprehensive planning programme should be executed to ensure the success of the programme. As the system requires pre-designed outcome or products, all stakeholders must have a say in establishing and measuring them. The real driving force is accreditation. Conversely, OBE actually generates the real time benefit which is culture Continual Quality Improvement (CQI). In this case, academicians, technical staff and students will be more integrated in the current engineering practice, exposed to the current issues, and developed required skills, such as communication, working with multidisciplinary team, culturing ethic and understanding social and sustainable developments and many others. Thus, students will not be assessed based on their fundamental knowledge but on skills as well.

OBE and Conventional Practice

Significant differences are verified between OBE and conventional practice. The following discussion highlights these differences and why OBE has been accepted by many accreditation agencies.

Conventional Practice

Conventional practice is distinguished by conventional prescriptive-based system. In this system, students are not being assessed, evaluated, and informed of the levels of achievement of the non-technical outcomes.

The programme is reviewed every five years based on universities' own review and comments from the external examiners (Abdul-Talib, 2007). Input from industrial and other stakeholders is lacking in the programme improvement. There are also proofs that universities are seen as not being serious enough to develop more well-rounded outcomes of graduate in a systematic way (Abdul-Talib, 2007). The seriousness seems not to be manifested in the curriculum, learning design, evaluation and assessment methods. At the end, there is not much assurance on the delivery of the outcome capabilities in every graduate.

Outcome-Based Education (OBE)

The OBE stresses on outcomes, of which any programme designed will focus on the key things students should understand and be able to do or the qualities they should develop. In the Civil Engineering context, the students are expected to have adequate knowledge in Civil Engineering practice (technical skills) as well as non-technical skills that require them to be relevant in the industry. The programme offered will be designed in many folds of gain including adapting emerging technologies, changing disciplines, and merging of discipline, adapting evolving educational paradigms (method of delivery, type of institution), emphasising on outcome which focuses on preparing graduates for industrial practice and the programme is responsible in demonstrating how criteria and educational objectives are being met. In OBE, the programme is required to demonstrate the level of accomplishment by programme assessment and evaluations. Figure 1 shows the closing loop for OBE implementation.

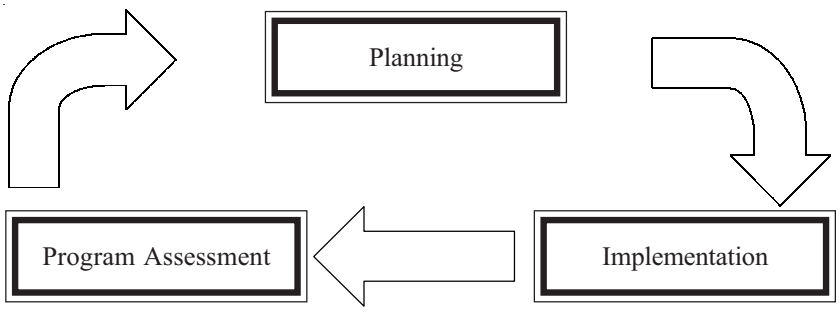

Figure 1: Programme Implementation by OBE System

OBE requires the owner of the programme to develop self-assessment to meet these requirements:

i. provide evidence how the need for stakeholders are met
ii. able to exhibit how PeO and be PO is to be achieved, and
iii. able to demonstrate the CQI

The assessment will give chance for immediate remedial work to be done if any setback occurs during implementation. With this check and balance practice, the CQI can easily being adapted to all implementers, students and systems in the higher learning institution.

Table 1 below shows the outcome of conventional education system and OBE approaches. Conventional education only focuses on what graduating students should be taught and how much time should be preferred completely. On the other hand, OBE focuses on what the graduating students will be able to do or understand by the time of graduating.

Table 1: The Differences of Pre-descriptive and Outcome-Based Education

Pre-descriptive	Outcome-Based Education
Curricula and courses emphasize content.	Curricula and courses balance content, skills and attitudes (i.e traditional content; critical and creative thinking; problem solving, problem formulation; teamwork, communication; ethical, professional considerations).
Fundamentals – applications "trust me".	Integrated – introduce engineering problems and projects; bring in basic science and mathematics in the context of the problems and projects.
Content determined by syllabus. ("I will cover…")	Content determined by learning objectives. ("The students will be able to…")
Teaching style addresses only one learning style.	Teaching style addresses spectrum of learning styles (visual/ verbal, concrete/abstract, active/reflective, sequential/ global).
Except in labs, most in-class activities done by questioning, instructor (lecturing, occasionally asking question).	In all classes, burden of activity shared by instructor and students (discussing, explaining, brainstorming, reflecting, using computers).
In course assessment, students do not know the criteria being assessed (no transparent between lecturer and student); and students do not understand the criteria being assessed.	The course assessment must be an open process (transparent); should be valid; need to be reliable, need to be fair; and should be an integral component of course design.

(*continued*)

(*continued Table 1*)

Pre-descriptive	Outcome-Based Education
The approach to assessment remains conservative through ignorance.	Results from assessment processes need to be applied for continuous improvement of student learning outcomes and programme effectiveness. Always alert on quality of graduates (include close-loop of programme assessment process).
Wide variations in marking between modules and assessors.	Frames and reference which lecturers bring to assessment are systematic and standard.
Absence of well-defined criteria so consistency is difficult to achieve. Criteria used between subjects, within subject, between institutions and within institutions are not consistent	A shift in focus – the greater focus on outcomes criteria and course objectives. Establishing and measuring them by said of stakeholders. All the outcome criteria – course objective are mentioned and documented to avoid inconsistency.

The Implementation of OBE in Engineering Education

In July 2006, all Civil Engineering programme within the UiTM system started adapting a new syllabus designed with OBE. The Faculty of Civil Engineering UiTM Pahang (FCE Pahang) offered its first Diploma in Civil Engineering with OBE curricular in 2006 and the first batch of students will be graduating in July 2009. Committed with the new designed programme, the FCE UiTM has come up with a strategic plan to implement OBE by developing approach model for course delivery. The model includes understanding the nature of subject, clarification context based on nature of subject, appoint suitable POs and at the end, to be able to produce rubric for course delivery and assessment program.

The approach model has been developed after a series of training and workshop provided within the UiTM system. FCE UiTM Pahang's experience in OBE training and practices is described in Table 2.

Delivery of Program Based on OBE

FCE Academic Quality Unit of UiTM Pahang has been established, focusing on the requirement needed in OBE practices. This unit is responsible in conducting training programmes, promoting research activities in OBE practices, organising regular discussion with senior members, providing consultation, and promoting CQI which is required for OBE implementation. The unit has regular discussions and

Table 2: Road Map for OBE Implementation

Stages	Description
Stage 1: Understanding the philosophy of OBE & designing curriculum and syllabus based on OBE	Revised curriculum and syllabus workshop's to promote understanding of OBE and produces new curriculum which directly includes OBE and course outcome-program outcome (CO-PO) for each course offered. ↓ Workshop on guidelines for the implementation of OBE to introduce the techniques and evaluation system towards OBE. ↓ Workshop on Outcome-Based Assessment of Engineering Education focusing on the delivery of engineering program, assessment of engineering programme, the process to achieve accreditation from respective body, system that involves in accreditation, the documentation and Continuous Quality Improvement.
Stage 2: Awareness on OBE	Talk to promote awareness on introduction of OBE which involved academic administration staff from FCE UiTM Pahang and Kolej Poly-Tech MARA Pahang on the introduction, the philosophical aspect, the level of execution of OBE and other related issues in engineering education. ↓ Establishment of Academic Quality Unit to monitor programme following OBE practice including managing training and CQI programmes for lecturers and technical staff.
Stage 3: Delivery of programme based on OBE and assessment and evaluation based on OBE	Workshop to enhance understanding on the implementation of classroom practice and the assessment system, involved in developing mapping for course outcomes – programme outcomes (CO-PO), rubric based on Bloom's taxonomy, lecture notes, assignments, tests, understanding of programme assessments, and standardisation.
Stage 4: Implementation of CQI	Contribution in consultation at UiTM Perlis focusing on the delivery of courses, the assessment system; the developing of course rubric based on Bloom's taxonomy, the delivery of learning outcome, understanding of course outcome and programme mapping. ↓ FCE UiTM Pahang Mini Colloquium 2007 to present done in classroom during the previous semester; sharing experiences, open discussion for CQI, verifying good practice, searching for consensus, promoting OBE to new lecturers and other faculties' lecturers and as a part of CQI practices.
Stage 5: Preparation for accreditation	Currently, there is no request for programme accreditation at UiTM Pahang. Nevertheless, all the above programmes have been executed as preparation for accreditation, and the requirement is partially suited for accreditation by MQA.

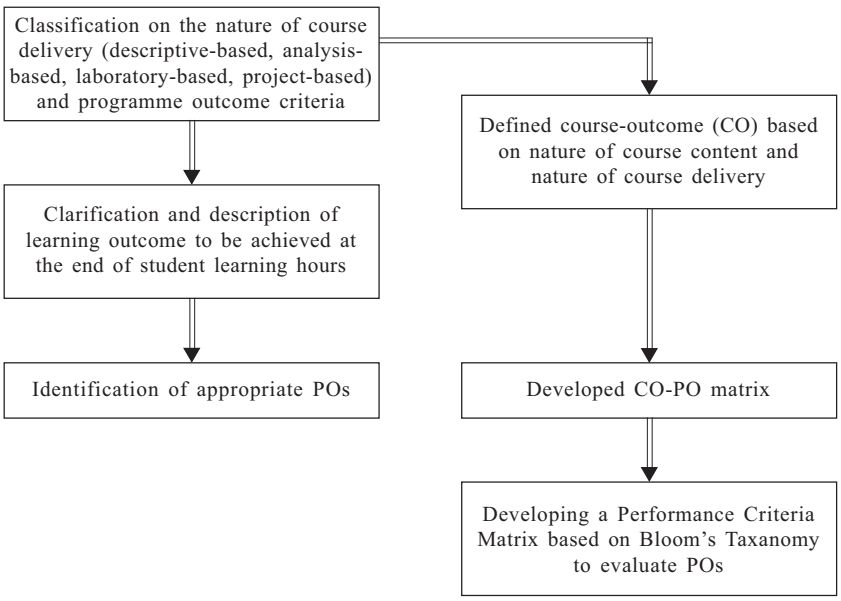

Figure 2: Approach Adopted in Developing Course Delivery Based on OBE

brainstorming activities with senior academic staff to formulate best practices on the delivery of the programme. The unit successfully establishes a model to deliver course based on OBE. Figure 2 illustrates the approach adopted in the course delivery. Consensus is achieved by clustering all courses according to the appropriate nature of the courses (i.e: descriptive-based, laboratory-based, analysis-based and project-based). The clustering is verified to provide a general framework for academic staff to formulate methods of course assessment later in classroom practice.

Classification on the Nature of Course Delivery

In engineering program, the nature of course delivery can be clustered into four broad categories. The categories are descriptive-based, analysis-based, laboratory-based and project-based. This identification is to provide general guidelines to design more appropriate course outcomes (CO) and suitable programme-outcomes (PO) for that particular course. This process can be done in parallel. Table 3 shows the nature of courses, description on course and suggestion of POs.

Table 3: Description on Nature of Subject

Nature of subject	Description	Suggestion of POs
Descriptive, Analysis	• Show that they can employ general principles, theories, concepts, and/or formulas from mathematics, science, and engineering problems. For a particular problem, graduates should demonstrate that they can: define and describe the pertinent principles and appropriate assumptions, theories, concepts, and/or formulas: explain how they are appropriate to the problem; and demonstrate how they have been applied in the solution of the problem. • Respond positively, to the instruction and guidance they receive in applying knowledge of mathematics, science, and engineering to the particular engineering problems they encounter.	PO1, PO4, PO5, & PO7
Project-based	• Show that they can acquire skills for project based; i.e., determine their work, conceptualise and organise their work, and time management. • Show that they need to learn work in community. Exhibits good leadership with managerial qualities and can participates actively as an individual also in a group work. • Show that they can collaborate in multi-disciplinary components, recognise their responsibilities and perform their work. • Show that they can summarise effective strategies for dealing with a variety of interpersonal and communication problems that commonly arise. Choose the best of several given strategies for a specified problem and justify the choice.	PO1, PO2, PO3, PO4, PO5, PO6, & PO7
Laboratory-based	• Show that they can take an experimental problem and develop a hypothesis, define the pertinent dependent and independent variables, and establish a sound experimental method that will allow them to measure the variables and test the hypothesis. • Show that they can conduct an experimental procedure, use laboratory materials properly and safely, carefully note observations in a laboratory notebook, and describe the procedure clearly. • Show that they can measure and record raw experimental data and analyse those data for the purposes of understanding and explaining the data. Graduates should be able to represent data in both verbal and visual forms (equations, tables, graphs, figures, etc) in a way that is both an accurate and an honest reflection of the data. • Show that they can render the data meaningful by discussing the data in the context of the hypothesis and appropriate theories and principles and by stating, clearly and concisely, conclusions that can be drawn from the experiment.	PO1, PO3 & PO6

Program Outcome

One of the requirements needed by the accreditors from MQA is the establishment of learning outcomes and the programme design. To suit that particular purpose, Program Outcome for diploma level has been appointed. These outcomes were formulated after a series of workshops, consultations with other academic institutions local and abroad. The diploma of Civil Engineering curriculum which has been design based on OBE, affirmed to achieve 7 programme outcomes (POs)based on the EAC criteria. The 7 POs for Diploma in Civil Engineering in UiTM mentioned in the 'Buku Program EC110' have been adapted from The Generic Attributes of a Graduates (EAC, 2003) as shown in Table 4. Table 5 is the description of the soft skills or POs partially adapted from the Civil Engineering Body of Knowledge for the 21st Century: Preparing the Civil Engineer for the Future (ASCE, 2004).

Table 4: POs for Diploma Programme in UiTM

PO1	Ability to acquire and apply knowledge of engineering fundamentals
PO2	Ability to communicate effectively, not only with engineer but also with the community at large.
PO3	Ability to function effectively as an individual and in a group with the capacity to be a leader or manager as well as an effective team member.
PO4	Understanding of the social, cultural, global and environmental responsibilities and ethics of a technical assistant / assistant engineer and the need for sustainable development.
PO5	Recognising the need to undertake lifelong learning and possessing / acquiring the capacity to do so.
PO6	Ability to function on multi-disciplinary teams.
PO7	Knowledge of contemporary issues.

All of these POs will be addressed during students' learning years within the courses offered. The entire course offered, will be especially subjected to civil engineering discipline. In spite of conveying the context, the delivery will be designed corresponding with the appropriate POs.

Defining Course-Outcome (CO)

Course outcome is essentially determined to reflect in general the course content. It is a scheme which is to be achieved after students have completed the course. The statement of course-outcome should be written in an objective sentence so that the documentation process latter on can

Table 5: List and Description of Soft Skills

Soft Skills	Description
Ability to acquire and apply knowledge of engineering fundamentals	• Show that they can employ general principles, theories, concepts, and/or formulas from mathematics, science, and engineering problems. For particular problem, graduates should demonstrate that they can: define and describe the pertinent principles and appropriate assumptions, theories, concepts, and/or formulas: explain how they are appropriate to the problem; and demonstrate how they have been applied in the solution of the problem. • Respond positively, to the instruction and guidance they receive in applying knowledge of mathematics, science, and engineering to the particular engineering problems they encounter.
Ability to communicate effectively, not only with engineer but also with the community at large.	• Acquire effective communication includes listening, observing, reading, speaking, and writing and requires understanding of the fundamentals of interacting effectively with technical and non-technical or lay individuals and audiences in a variety of settings. • Ability to be versatile with mathematics, graphics, the worldwide web and other communication tools.
Ability to function effectively as an individual and in a group with the capacity to be a leader or manager as well as an effective team member.	• Possess a conceptual understanding of group dynamics, that is, how to make groups work effectively. This conceptual understanding includes: how to create a group climate that encourages success, how to recognize and make effective use of power resources in group activities, how to use communication and negotiation strategies for dealing productively with conflict. · Show that they can participate effectively as team members in group projects: working cooperatively with others, accepting diverse views, encouraging active participation of others, dealing productively with conflict, and taking leadership roles as the need arises to accomplish the group's objective. • Show that they can work successfully with people who are in other fields and those who perform a variety of functions within a group as well as demonstrate flexibility in the roles and functions they play. The trade that the student must posses are exhibit respect for these people and the diversity they bring to the group, accept and incorporate where appropriate ideas from people with different perspectives, explain pertinent engineering principles and application to people who have no training in those principles and applications but who need to make use of them.
Understanding of the social, cultural, global and environmental responsibilities and ethics of a technical assistant/assistant engineer and the need for sustainable development.	• Acquire the understanding of social, cultural, global and environmental responsibilities and ethics of a technical assistant/assistant engineer and the need for sustainable development.

(*continued*)

(*continued Table 5*)

Soft Skills	Description
Recognising the need to undertake lifelong learning and possessing / acquiring the capacity to do so.	· Acquire life-long learning mechanism available for personal and professional development include additional formal education, continuing education, professional practice experience, active involvement in professional societies, community service, coaching, mentoring, and other learning and growth activities. • Personal development in developing understanding of and competence in goal setting, personal time management, communication, delegation, personality types, networking, leadership, the socio-political process, and effecting change.
Ability to function on multi-disciplinary teams.	• Possess an ability to lead design or other team as well as participate as a member of a team. • Understanding team formation and evolution, personality profiles, team dynamics, collaboration among diverse disciplines, problem solving, and time management and being able to foster and integrate diversity of perspectives, knowledge, and experiences.
Knowledge of contemporary issues.	• Appreciate the relationship of engineering to critical contemporary issues such as multicultural globalisation of engineering practice; raising the quality of life around the globe; the growing diversity of society; and the technical, environmental, societal, political, aesthetic, economic, and financial implications of engineering projects.

easily be done. The CO can be designed more coherent and directly encompassing with the awareness of course nature and course content. Ambiguity and jargon sentences should be avoided to prevent confusion to lecturers and administrators.

Developing CO-PO Matrix

CO-PO matrix is the framework that lecturers should work with to deliver the course. It is actually mapping CO with appropriate PO. This will give the idea; the delivering of CO should be done in parallel with the delivering of appointed PO. Lecturer will provide with their own creativity, a proper documentation form to provide evidence that the CO-PO has been delivered towards the end of learning session. This documentation is hard evidence to be submitted to accreditors for accreditation process.

Defining Performance Criteria

Performance criteria matrix is used as a blueprint for course delivery which includes all the description needed (i.e., course-outcome, designated programme-outcome to be achieved at the end of learning hours and

detailed description on the assessment system and marking scheme). However, this performance criteria matrix can only be developed by understanding the whole processes and sequences as illustrated in Figure 2. Performance criteria are best presented in a rubric. The rubric can be performed as standardisation for course execution in classroom practice for lecturers with shared codes, statement for evaluation; provide standard, reliable, fairness, transparent and as a document for accreditation. The rubric can also be used as assessment tools.

Assessment of a course or programme is an essential exercise design to achieve many folds; to design and implementation for classroom practices, to collect appropriate data for CQI processes and as evidence for accreditation. This will lead for the blueprint to assess students on their performance and the variation of achievement level for all task designs in classroom, assignments and exams.

In addition, each POs stated in 7 POs for the Diploma in Civil Engineering UiTM belongs to the fixed domain in Bloom's taxonomy. Subsequently, the POs can be clustered or best described through Bloom's Domain and Taxonomies. Table 6 shows the classification of the PO's into two (2) main domains.

Table 6: Classification of Pos Based on Blooms' Taxonomy

Blooms Taxonomy Domain	POs
Cognitive	PO1
Affective	PO2, PO3, PO4, PO5, PO6 & PO7

The performance criteria are, then, decided based on the projected level of student achievement. The performance criteria might vary depending on the year of students sitting for that particular courses assuming students' experience in learning progress each year.

Conclusion

The FCE UiTM Pahang has endured a great challenge to establish engineering education based on OBE. As the only faculty in UiTM Pahang that has shifted towards the new system, this faculty is obliged to understand all of the principle beginnings with the driving force which is accreditation and the Outcome-Based Education (OBE) system.

Understanding the force driven for OBE is a sturdy motivation to understand and implement OBE in the FCE UiTM Pahang. This has led to the execution of planning, implementation and assessment programme. This paper has shared the striving experiences of the FCE UiTM Pahang for the current development in engineering education. OBE is an approach that can promote culturing more directed and focus in course delivery, regular discussion amongst shareholder and continuous quality improvement (CQI). As the experiences are far from accreditation requirement, this small effort, nevertheless, should be done to encourage others and enhance programme for OBE implementation.

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