Quality Management System: A Model to Consolidate OBE and Stakeholders Requirement

Asmidar Alias
Nor Maslina Mohsan
Farah Wahida Abdul Latib
Khairi Khalid

ABSTRACT

Issue in quality control and reporting adequate data for various stakeholders have been the center of discussion in Faculty of Civil Engineering (FCE) UiTM Pahang since 2006. The implementation of Outcome Based Education (OBE) required planning, implementation, assessment and continual quality improvement (CQI), thus comprehensive data management is essential. However, FCE UiTM Pahang has been requested with different types of data and reporting styles responding to various stakeholders. Repeating and redundant processes encountered by faculty members to fulfill this requirement is tedious and time consuming. A model for quality management system (QMS) to consolidate these requirements is formulated to alleviate difficulties and minimize complexity during audit practices. The processes, approach, specific requirement involved for this exercise are discussed, which highlight the salient aspect of the problems.

Keywords: *data reporting, Outcome Based Education (OBE), Quality Management System (QMS)*

Introduction

Quality assurance has transformed higher education scenario at all levels. Quality is identified with the degree to which the product or service meets the expectations of the customer and focus to the degree to which the product or service conforms to design specifications (Lewis et al., 2001). The more effective the organization is in meeting customer expectations and design specifications, the higher the implied quality level of its output (Lewis et al., 2001). Thus, quality movement is very vital to ensure graduates' survival in an increasingly competitive world market. This element is essential for all accredited programme at Institution of Higher Learning (IHL). The transformation is done to meet the needs of the globalised and diversified economy and to remain globally competitive (Sharifah Hapsah, 2007), consequently the Outcome-Based Education (OBE) is to be implemented in IHL. Implementation in Malaysia began in 2006 by commencing engineering faculties in IHL piloting for the paradigm shift in higher education teaching and learning.

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 ability. OBE requires programmes to be implemented in one close loop cycle, beginning with planning, implementation, assessment and Continual Quality Improvement (CQI). One vital aspect in OBE practices is quality management system (QMS) for continual quality improvement (CQI). The focus in CQI in OBE implementation is assessment and evaluation. In this practice, the owners of the programme themselves should be able to conduct a series of evaluating system to ensure the Programme Objective (PeO), Programme Outcomes (POs) and implementation strategies are inter-related in fulfilling the institution's mission (Asmidar et al., 2009) with visible response from stakeholders such as employers, alumni, parents, graduates and managements. Complementing this, EAC (2007) has highlighted that any engineering programmes should provide minutes and records of action, and improvement from the programme teaching teams, Industry Advisory Committee and staff-student consultation. In short, this assessment/evaluation 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 objectives (PeO) and programme outcomes (PO) are to be achieved; and iii) able to demonstrate the CQI.

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). 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. However, the documentation required by stakeholders in management level varies to fulfill different aspects in OBE implementation. Consequently, has weighing down Faculty of Civil Engineering (FCE) UiTM Pahang to manage all documents to suit different requirement. This paper is to explain the QMS's practices that conducted in FCE UiTM Pahang to consolidate the needs.

Stakeholders and Documentations

Quality aspects to ensure teaching and learning (T&L) practices are executed according to programme objectives and outcomes are monitored by various stakeholders. However, the requirements vary responding to different stakeholders. Currently, FCE UiTM Pahang requested report to be made to Unit of Jawatankuasa OBE UiTM Pahang, FCE UiTM Shah Alam and Institute of Quality and Knowledge Advancement (InQKA) UiTM Pahang. These stakeholders appoint auditors to audit the implementation of T&L by referring to available data. The visit is regular; however the schedule is not necessarily fixed or routine. Figure 1 show the strategy formulated in FCE UiTM Pahang responding to the needs of documentation from various stakeholders.
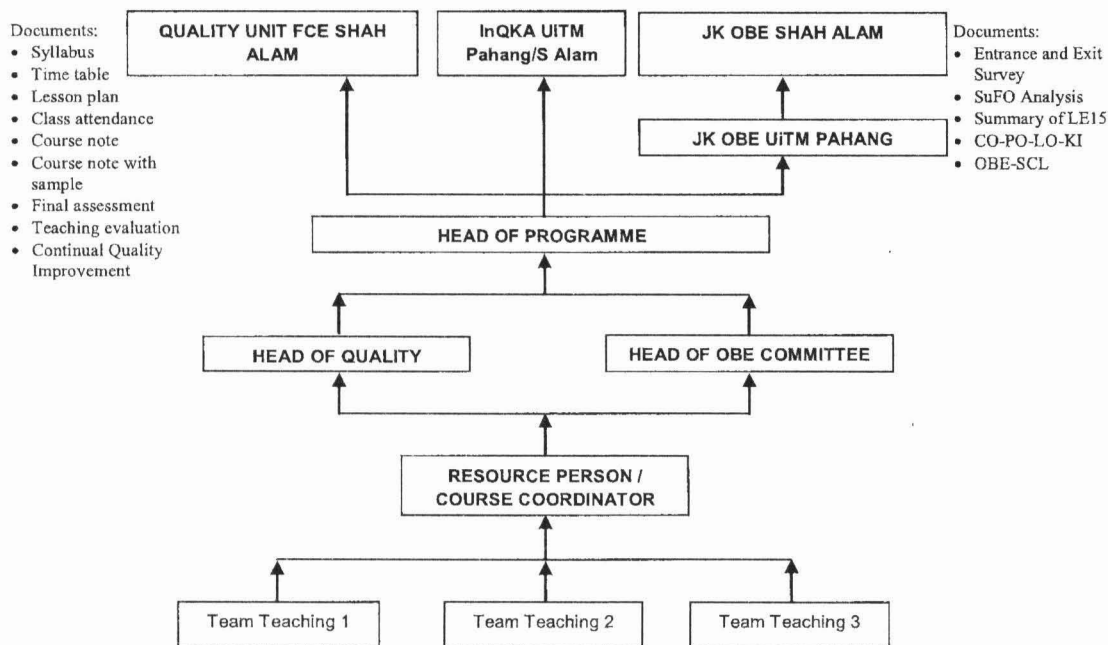

Figure 1: Data Collection from Course Coordinator to Stakeholders

JK OBE UiTM Pahang

JK OBE UiTM Malaysia and Pahang have regulated to produce standard report known as Outcome Based Education – Close the Loop (OBE-CDL) two weeks after results are officiated. This OBE-CDL report consists of 1) Entrance and Exit (EE) survey report, 2) SuFO analysis, 3) summary of exam results and 4) alignment level CO-PO-LO-KI and 5) OBE-SCL level. These five elements of measurement are analysed and the performance value will act as indicator of programme attainment based on OBE principle.

EE survey is students' perception survey on the understanding of course content. It consists of questions that relate to Course Outcomes (COs) and align with POs of the course. Entrance survey is asked on second or third week of the semester. Same set of question will be used as exit survey which is done at thirteen or fourteen week of the semester. Collected data is then analysed to see the gap. Each gap acts as indicator to represent students' understanding before and after completing the course. OBE-CDL requires EE to be reported as summary of gap. Figure 2 shows the summary of exit survey – entrance survey. There are many ways of reporting for EE survey; therefore, FCE UiTM Pahang need to adjust available data to suit JK OBE requirement.

COURSE CODE	-4	-3	-2	-1	0	1	2	3	4	20th PERCENTILE	80% students above value	CDL INDICATOR	
1 ECG103	0	2	3	2	24	69	63	19	0	36	1.00	2	*Fair*
2 ECM106	0	0	5	19	224	409	443	238	72	282	1.00	2	*Fair*
3 0										0	0.00	0	*Poor*
4 0										0	0.00	0	*Poor*
5 0										0	0.00	0	*Poor*
6 0										0	0.00	0	*Poor*

Figure 2: Summary of EE Survey by Using Gap Analysis (OBE-CDL, 2011)

Second requirement for OBE-CDL reports is SuFO analysis. This is the survey done by students' reflection on the course, lecturer delivery and facilities. However, the actual data appear in SuFO report is not compatible to be directly used in OBE-CDL report, therefore lecturer needs to analyse, summarised and report as shown in Figure 3.

	COURSE CODE	1 (Sangat Tidak Setuju)	2 (Tidak Setuju)	3 (Setuju)	4 (Sangat Setuju)	20th PERCENTILE	80% students chose this category and above	CDL INDICATOR	
1	ECG103	1	12	889	4817	1143.80	4	5	Excellent
2	ECM106	5	44	658	4179	977.20	4	5	Excellent
3	0					0.00	0	0	Poor
4	0					0.00	0	0	Poor
5	0					0.00	0	0	Poor
6	0					0.00	0	0	Poor

Figure 3: Frequency of Respondent on SuFO Analysis (OBE-CDL, 2011)

Focusing on the examination results, the performance of students will be taken into consideration. The number of student that obtain grade A+, A, A-, B+ and other grades will be recorded as in Figure 4. These results then are translated to CDL indicator with rating from 1 to 5.

PROG.CODE EC 110
PART 2

You can get these results from ISIS @ Laporan Peperiksaan 7.7.2

COURSE CODE	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	E	F		20th percentile	80% students above GPA of	CDL Indicator	
1 ECG103	0	3	11	29	49	60	40	33	0	7	5	1	1		47.8	2	2	Fair
2 ECM106	7	62	45	39	37	32	7	9	0	0	0	1	1		48	2.33	2	Fair

Figure 4: Summary Result Extract from Students' Examination Grades (OBE-CDL, 2011)

Figure 5 shows the assessment of CO-PO-LO-KI. This exercise is to ensure that every course is designed with appropriate COs. This COs then align with PO, LO and soft skill (KI). Two rating which is 1 (yes) and 0 (no) are used. Rating 1 is used to indicate that the course is aligning with PO, LO and KI while 0 shows that it is not yet align. This assessment is done with the presence of the course coordinator, senior members and quality unit of faculty to give appropriate rating.

Figure 5: CO-PO-LO-KI Assessment (OBE-CDL, 2011)

The crucial part is to determine OBE-SCL level. Official audit meeting is required to gather as much information the faculty need as possible to respond on how the course being conducted, assessed and implemented in classroom practice.

Course coordinators will act as the representative of the course. Twelve broad topics will be the center of discussion as listed in Figure 6. This exercise requires evaluation from faculty members who are well verse with OBE principle, the Head of Programme and representatives from Quality Unit. The rating will be given based on the answers by the auditee (Course Coordinator). Every feedback that can help to enhance the quality of delivery will be recorded and discussed in faculty meeting.

Figure 6: OBE-SCL Level of Implementation (OBE-CDL, 2011)

FCE UiTM Shah Alam

FCE UiTM Shah Alam will act directly as the stakeholders to control the overall quality in T&L for Diploma in Civil Engineering (DCE) programme conducted in states campuses. In order to make every implementation is according to specification designed by the faculty, each state campus that offers DCE should file the data in proper course file. Item needed in the course file as tabulated in Table 1:

Table 1: Course File Requirement and Specification

NO	ITEMS	DETAILS
1	Syllabus	1. Updated version with CO-PO authenticated
2	Timetable	2. Current & Signed by the Dean
3	Lesson Plan	3. Weekly Lecture Schedule
		4. Test/Assignment/Presentation/Field trip Indicated in Plan
4	Class Attendance	5. HEA Form Adopted
		6. Completed the 14-Week Schedule
5	Course Notes	7. Start With Learning Outcomes
		8. Summarized Notes/Notes on PPT Format Given
		9. Uploaded Copy in i-learn Portal
6	Course Note With Sample (Based on OBE)	10. Sample Test/Assignment Included
		11. Assessment based on OBE Format (POs) (Evidence included)
7	Final Assessment (Exam Common Test)	12. Final Exam Paper and Answer Scheme with breakdown marks
		13. Assessment based on OBE Format
8	Teaching Evaluation	14. Summary Available with grade/LEO/Other Format
9	Continual Quality Improvement	15. Format as set by Academic Office FCE/ Others
		16. Shortcomings for the Current Sem. Identified
		17. Improvement for Next Sem. Outlined

The detail is to balance the use of face to face element, none face-to-face or guided learning for students, ensuring detail lesson plan has been designed before semester begins, culturing e-learning by utilizing i-learn portal, methodology of teaching and assessment, students' feedback (SuFO) and continual quality improvement (CQI). This practice is to introduce to all faculty members the importance to have proper planning before conducting any course as classroom practice, culturing to keep important data as a compulsory record and CQI. FCE UiTM Shah Alam will schedule regular audit to state campuses as part of QMS.

The essential of this practice is every course coordinator should be able to report PO performance by submitting LE15x as PO measurement tool in FCE. Each course should be able to achieve 50% of overall performance for each PO. Any setback on PO achievement requires justification and need to plan for CQI. This achievement will be presented in Faculty's Board Meeting (LAF) and compiled with other branch campuses.

Institute of Quality and Knowledge Advancement (InQKA) UiTM Pahang

InQKA quality monitoring is operated based on ISO movement. The model and principle is to ensure that every programme in faculty is able to record data and subjected to audit exercise. The elements needed to be presented in course file are syllabus that has been endorsed by Dean, examination papers and answer scheme. However, beginning on 2011, InQKA Shah Alam has functioned as the key player for audit exercise in T&L implementation in faculty and management. The audit practice has the authority to ask anything related in T&L without following the former course file system based on ISO model. The auditors monitor the quality in T&L in term of exam and test standardization, depth and breadth in T&L and setting question papers to student, monitoring, quality control, CQI, peer assessment, mentor and mentee system, and broader issue in T&L.

Consolidating Data with the New Approach of Course File Management System

Understanding the requirement needed by stakeholders has encourage the management team in FCE UiTM Pahang to formulate practical approach to accommodate the needs. However, the real problem need to be addressed, therefore a comprehensive planning and execution practice in QMS can be done with ease. Further discussion focuses on the issue in quality control thus provide the solution to consolidate audit requirement in one course file as new approach practiced by FCE UiTM Pahang.

Issues in Quality Control

Increment in the number of students' enrolment is one major aspect to be considered. Students are divided into seven to ten groups that required more than one lecturers to deliver one course. Thus, course coordinator (CC) or resource person needs to be appointed in order to control the delivery in term of contents, scheduling, depth and breadth, topics and tests covered, assessments to be aligned with PO and CO, data collection, monitoring and reporting. As FCE UiTM Pahang experienced this difficulty, a systematic approach needs to be identified so that lecturers in the team teaching will be alert of what are expected from them. Management team had discussed this crucial issue with FCE UiTM Pahang members to find the best solution for all. As audit is inevitable, recognizing all stakeholders' needs is essential. All related information concerning quality control is delivered and made known in faculty meeting, therefore everybody that is involved in managing course is attentive. CC will be the representative for that particular course to submit all relevant report to head of programme. CC will work closely with team teaching for that particular code in order to ensure data can be reported on time.

Introduction of Course File (CF): A New Approach to Consolidate Audit Requirement

In previous practice there were, only three items available in course file (CF), which are latest 1) syllabus, 2) exam questions 3) answer scheme. The details of T&L aspects are presented in teaching portfolio (TP). However, lecturers are required to record data according to the classes conducted. Thus, overall performance for one course is missing. However, this data needs to be compiled after semester ended and before final examination meeting. Massive compilation process needs to be done by management team with limited time frame. As FCE UiTM Pahang conducting more than 30 courses with the increasing number of group previous practice has weighing down the unit.

The data need to be reported at the end of semester is one vital aspect to ensure quality control in FCE UiTM Pahang. This will reflect to the implementation of OBE to ensure all courses conducted are aligned with designed COs and POs. Classroom achievement needs to be reviewed and essential feedback need to be given to CC. CC will compile these records and summarize to present in term of course performance. Head of programme will gather this data to reflect on the programme performance. Each data is important as the support evidence for continual quality improvement (CQI).

However, there are other documents that will be acquired by stakeholders during audit processes. Therefore, the management team has issued new CF approach which gathered 21 items as stated in Table 2 for the overall QMS in T&L. CC will be the person responsible to manage and control data reported in this new CF. This new approach has helped management team in many folds including consolidating POs performance for overall programme achievement, CQI exercise and OBE-CDL report. Furthermore, the new approach eases CC in audit exercise as all data has been compiled in one single file.

Table 2: Data Required in Course File

NO	ITEMS	DETAILS
1	SYLLABUS	1. Updated version with CO-PO authenticated
2	TIMETABLE	2. Current & Signed by the Dean
3	LESSON PLAN	3. Weekly Lecture Schedule
		4. Test/Assignment/Presentation/Field trip Indicated in Plan
4	CLASS ATTENDANCE	5. HEA Form Adopted
		6. Completed the 14-Week Schedule
5	COURSE NOTES	7. Start With Learning Outcomes
		8. Summarized Notes/Notes on PPT Format Given
		9. Uploaded Copy in i-learn Portal
6	COURSE WORK WITH SAMPLES (Based on OBE)	10. Sample Test/Assignment Included
		11. Assessment based on OBE Format (POs) (Evidence included)
7	FINAL ASSESSMENT (Exam/ Common Test)	12. Final Exam Paper and Answer Scheme with breakdown marks
		13. Assessment based on OBE Format
8	TEACHING EVALUATION	14. Summary Available with grade/LEO/Other Format
9	CONTINUAL QUALITY IMPROVEMENT	15. Format as set by Academic Office FCE/ Others
		16. Shortcomings for the Current Semester Identified
		17. Improvement for Next Sem. Outlined
10	OBE-SLC	18. Entrance Survey
		19. JSU
		20. Student Portfolio
		21. Exit Survey

Quality Management System (QMS) in Faculty of Civil Engineering (FCE) UiTM Pahang

The essential of quality in T&L has been made clear in FCE UiTM Pahang. The management team in FCE UiTM understands the role and requirement of these stakeholders. However, as the T&L has expanded in term of function and accessibility, the management team foresees the requirements will be extended in the future and ready to adapt for changes. Thus, a movement in Quality Management System (QMS) has to be made discrete, feasible and additionally manageable within the range of capability and competency of faculty members. As FCE UiTM Pahang needs to respond with various stakeholders in different time frame of audit exercise, three QMS exercises have been introduced which are 1) resource person or course coordinator system and 2) quality unit 3) internal audit.

Course Coordinator (CC) System

Head of Programme introduces a resource person or course coordinator for every course in Diploma in Civil Engineering programme as quality assurance in T&L practice. The function of the course owner is to coordinate the team members (Lecturers) for course implementation. The course implementation starts from the preparation of lesson plan before the lecture commences every semester and to plan for the course assessment. It is very important for the course owner to

conscientiously plan the assessment to ensure the target POs and COs will be achieved and the types of assessment are in line with the course syllabus.

Starting from December-April 2011, the Quality Unit and OBE Unit of Faculty of Civil Engineering UiTM Pahang were performing the Internal Audit in order to prepare for the CDL OBE-SCL report. The task and role of course owners are very important and have been expand in the process of preparing the CDL OBE-SCL report. The course owners have to coordinate the Entrance-Exit Survey (EE Survey) from the preparation of the questions based on COs, managing the questions, copy the questions, collect and analyse the data to fulfill the requirement of OBE-CDL report. Other than that, SUFO analysis for the team members is required to reflect on the overall performance for the course. The measurement of POs for the course should be prepared in LE15x form and the average value of POs is very important for continual quality improvement (CQI). The CQI process should be discussed by the course owner and team members if the result is below the KPI.

The introduction of a resource person or course owner for every course seems to be very effective in ensuring the weight or work load distributed equally among all lecturers. This is because all lecturers in Faculty of Civil Engineering are assigned with one course. These are proved by the capabilities of Faculty of Civil Engineering in preparing the CDL OBE-SCL report and submit to the Jawatankuasa Outcome Based Education (OBE) on time.

Quality Unit and Internal Audit System

FCE UiTM Pahang had formed two (2) quality units named as InQKa-MQA Quality Unit and OBE-MQA Quality unit in order to ensure quality improvement at faculty level and continually improve the effectiveness of its management system in order to realise its vision and mission.

The purpose of InQKa-MQA Quality Unit is to maintain management quality aspect and status of quality management at the faculty level in order to ensure it is running smoothly, all documents/records related are up-to-date and easy to access for audit purposes and improvement. The faculty was monitored by Institute of Quality and Knowledge Advancement (InQKa) UiTM Pahang. The organisation structure of this unit is shown in Figure 7.

The OBE-MQA Unit is formed as requirement of MQA and Jawatankuasa Outcome Based Education (OBE). The purpose of this unit is to ensure the implementation of OBE system among lecturers at the faculty level. The organisation structure of this unit is shown in Figure 8.
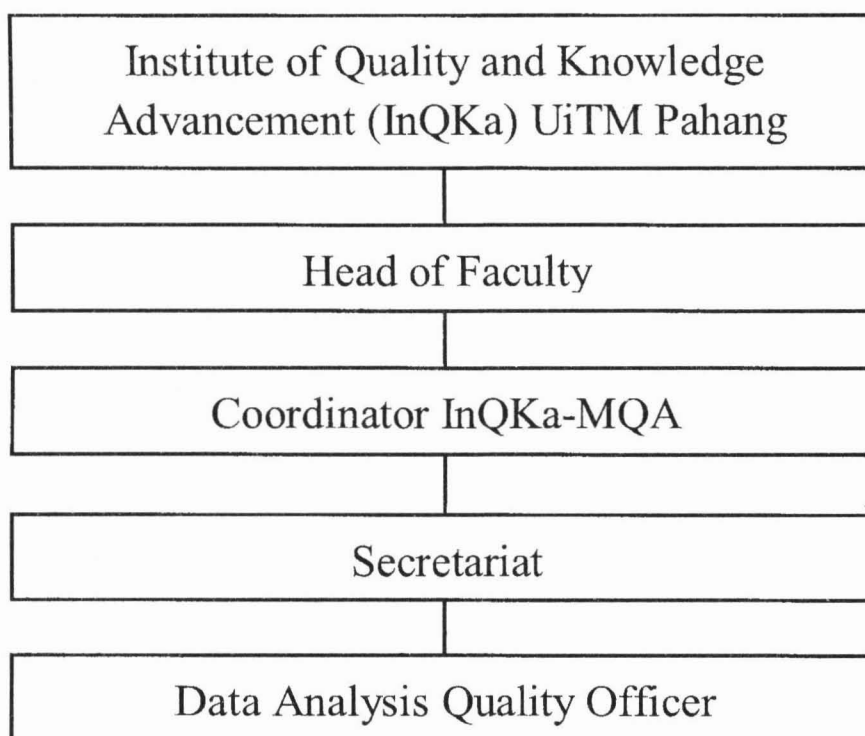

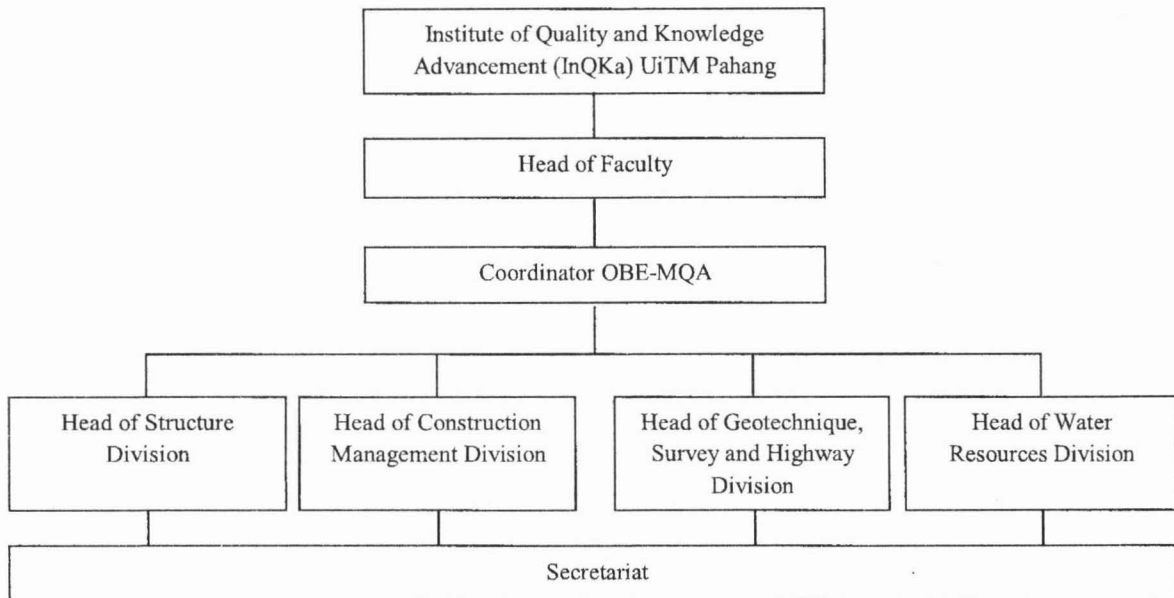Figure 7: Organization Structure of InQKa-MQA Quality Unit

Figure 8: Organization Structure of OBE-MQA Quality Unit

Internal Audit Process

The main documents prepared by InQKa-MQA Quality Unit and OBE-MQA Quality Unit are CDL OBE-SCL report for Self Review Report (SRR) and Self Review Portfolio (SRP). At the faculty level SRP concern about areas 2, 3, 6 and 7. The internal audit at faculty level is done every semester and all the academic documents for example course files, need to be submitted to the OBE Coordinator to audit and record the OBE implementation at the faculty level.

In the internal audit process, every course owner will be audited. From the previous practice by Faculty of Civil Engineering, the internal audit process was performed one month after final exam and the remainder will be sent through Official e-mail. Every course owner has to prepare and update the course file for 21 items that is compliant of OBE- CDL report and Faculty of Civil Engineering requirements.

The panels of internal audit Faculty of Civil Engineering including Head of Programme, Coordinator InQKa-MQA, Coordinator of OBE-MQA and secretariat of InQKa-MQA/ OBE-MQA. The execution of an internal audit in Faculty of Civil Engineering was to ensure the preparation of CDL OBE-SCL report completed, analyses on CGPA and POs measurement recorded properly and the course file updated on time basis.

Utilising Data and Analysis for Programme Improvement

The data, results and analysis from internal audit are very important in order to ensure continuous quality improvement at the faculty level. The previous internal audit conducted in Faculty of Civil Engineering was on 27 May 2011 and 3 June 2011. The purpose is to monitor and ensure all the documents/records related are up-to-date.

The findings of internal audit process done shows that 75% of the course owners are able to update the course file for 21 items that are compliant of CDL OBE-SCL report and Faculty of Civil Engineering requirements. But there are a few cases where the course owners are not alert with the POs delivered in the course. This is in terms of the assessment provided does not align and may be not suitable to measure and deliver the POs.

From the audit process as well, auditee are able to discuss and share on the best practices during classroom implementation for example active learning, problem based learning (PBL), video based learning (VBL) and others. This information and findings are very important for the process of curriculum review. As the quality movement is made visible to faculty members, it is possible to internalise this practice in the future.

Conclusion

Ensuring quality is vital in any programme conducted in institute of higher learning (IHL). Often quality control aspect will be in hand with audit system and regulatory. As FCE UiTM Pahang has the responsibility to report to many stakeholder, systematic approach QMS is essential to guide team in providing data to reflect the overall performance of the programme. The new course file approach with 21 items has prove to help in consolidating data and acted as part of

QMS practiced by FCE UiTM Pahang. This data is further use for CQI and evidence for curriculum review to provide nevertheless quality education.

Reference

Asmidar Alias, Norhafizah Hashim, Mohd Ikhsan Md Raus, Norshariza Mohamad Bhkari & Kamisah Ariffin (2009). *Programme Outcomes Assessment in OBE Implementation: On-line Evaluation System.* Prosiding KONAKA 2009, 377-384.

Basri, H. (2004). *Malaysia and the Washington Accord: The way forward for engineering education.* Paper presented at Conference on Engineering Education, Kuala Lumpur.

EAC. (2007). *Engineering Programme Accreditation Manual.* Kuala Lumpur: Engineering Accreditation Council of Malaysia. Retrieved May 12, 2011 from http://www.bem.org.my/v3/accreditation_manual.html

Lewis, P.S., Goodman, S.H., & Fandt, P.M. (2001). *Management. South-Western College Publishing.* Thomson Learning

Sharifah Hapsah. (2007). *The role of the Malaysian Qualifications Framework (MQF) & the Malaysia Qualifications Agency (MQA) in the transformation of higher education in Malaysia.* Retrieved December 28, 2007 from http://www.qsapple.org/presentation%20file.2007/Opening%20Plenary%-%20Prf%20Sharifah%20Hapsah

---

ASMIDAR ALIAS, KHAIRI KHALID, NOR MASLINA MOHSAN & FARAH WAHIDA ABDUL LATIB, Faculty of Civil Engineering, Universiti Teknologi MARA Pahang. asmidar@pahang.uitm.edu.my