THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Form 12(05/2011)

Completion Report
Project Supported by LTC/OBA Funding*

(Period covered: 01/02/2011 – 30/06/2011)

Part I: General Information

Funding Source (please tick ✓ as appropriate): ☐ LTC ☑ OBA Funding

Project Code: P89D4 **Host Department:** EIE

Project Title: Review of OBE Implementation and Way Forward in FENG

Project Team: Project Leader (Name & Dept): Dr Daniel P.K. Lun; Team Member(s) (Name & Dept):

Part II: Project Details

1. Financial Information

(a) Overview

Approved Funding:		Additional Funding Received (if any):		Total Funding Received:
	+		=	

Source of Additional Funding:

(b) Project Expenditure

Expenditure	Original Budget Approved	Revised Budget[1] (if applicable)	Actual Expenditure	Balance
Salary (Please indicate rank, number of staff members & salaries)				
Equipment				
General Expenses				
Consultation Fee				
Total				

[1] Please give reasons for the revised budget and quote the relevant authority's approval reference where appropriate.

2. Project Schedule

	Start date (dd/mm/yyyy):	Completion date (dd/mm/yyyy):
Dates as Stated in Original Proposal:	01/02/2011	30/06/2011
Actual Start and Completion Dates:	01/02/2011	30/06/2011

	Total no. of extension(s) obtained :	Obtained during the project period:
Project Period Extension(s) (if any):	NA	For a total of month(s)

Reason(s) for Extension(s) (if any): NA

* *LTC: Learning and Teaching Committee*
OBA Funding: Funding for Promoting Outcome-Based Approaches to Student Learning

3. Project Implementation

(a) Project objectives

The objective of this project is to conduct an expert review on the OBE implementation of the Faculty of Engineering (FENG) and to explore the way forward.

(b) Overview of specific work undertaken for achieving the project objectives (including any changes to original proposal)

While departments have already acquired some experience in OBE implementation, the Faculty believed that it was a good time to have an overall review in the Faculty in order to steer all departments to a similar direction in OBE implementation. Based on the review, the Faculty would also like to seek for the way forward that would further enhance the system. It was believed that external expert advice was particularly useful at this important moment. Departments could contrast their own experience with that in other countries where OBE has been established and matured.

To this end, we invited Dr Ira Jacobson to help in this project. Dr Jacobson has plentiful experience in OBE. He has served as a member of the Board of the Accreditation Board for Engineering and Technology (ABET) and as the Chair of the Engineering Accreditation Commission (EAC) in US. He was the Chair of the EAC Criteria Committee and played a major role in developing Criteria 2000. Dr Jacobson served on the Board of Directors for the American Institute of Aeronautics and Astronautics (AIAA) and as the Vice-President of Education for AIAA. He was also a member of the American Society for Engineering Education and the Society for Manufacturing Engineers and a member of the Hong Kong Institution of Engineers (HKIE) Accreditation Board. He has been a consultant of HKIE to help in setting up the system for outcome based accreditation.

To carry out the review, a set of documents that detailed the OBE implementation of the Faculty was sent to Dr Jacobson in January. They include the Definitive Programme Documents, PLOAPs, Annual Programme Review Reports, and Interim OBE Implementation Reports of all programmes of FENG. Based on the documents, five meetings were arranged with the responsible personnel and DLTC members of five departments of FENG, respectively, to discuss the findings of Dr Jacobson. The details of the meetings are as follows:

EIE: Tue, 3 May, 2:30pm – 4:30pm, CD634
ISE: Wed, 11 May, 10:00am – 12:00noon, AG712
ME: Wed, 11 May, 2:15pm – 4:30pm, EF305
EE: Thurs, 12 May, 10:00am – 12:00noon, CF617
COMP: Thurs, 12 May, 3:00pm – 5:00pm, PQ703

After that, an open seminar was held on 13 May (2:30pm – 4:00pm) at AG710 in which Dr Jacobson summarized his findings and made a number of constructive suggestions for future efforts. Their implications for accreditation and other external evaluations were also presented. The seminar ended up with a Q&A session in which Dr Jacobson further shared his experience with colleagues from different schools and departments of the University.

(c) Difficulties encountered, if any, which have affected progress, and remedial actions taken

In order not to biased Dr Jacobson, we tried not to screen the review material to ensure Dr Jacobson would have the original documents that described the effort of the Faculty in OBE implementation. This however introduced a heavy loading to Dr Jacobson since all documents adding together had more than 2,000 pages. This delayed a bit the review process. Fortunately, with the tremendous effort of Dr Jacobson, we managed to follow the original schedule to have the meetings in early May, when most colleagues in the Faculty were relatively less busy to attend the activities of the project.

(d) Deliverables/useful findings/good practices emerged

After the discussion with the related colleagues, Dr Jacobson submitted 5 reports (see attached) to the Faculty which detailed his findings and suggestions. The powerpoint of the open seminar is also attached with this report.

(e) Dissemination activities taken/planned to sustain impact

All reports have been sent via FLTC to the related departments. An FLTC meeting has been scheduled in September to discuss the response of departments with respect to the findings and suggestions of Dr Jacobson. The action plan of departments is expected.

(f) Self-evaluation or additional information/remarks

The project successfully facilitated an overall review of OBE implementation in the Faculty. Based on the discussions in the meetings and seminar, all departments have now a good understanding of the deficiencies of their current practice and the effort required to further improve the implementation work. Sometimes, advices from external experts can be superficial and biased. It is often due to the limitation of the time and information that the external experts can acquire to conduct the review. In this project, credit should be given to Dr Jacobson who was so kind to spend great effort in actually going through all documents we sent to him. We find that most comments he made are really up to the point, and most suggestions are practically implementable. They are extremely helpful for our next stage of implementation.

Name of Project Leader: Dr Daniel P.K. LUN Date: 25/7/2011

(in block letters)

Part III: Evaluation by D/SLTC (or by HoD/Dean of School^)

(a) Rating and comments/recommendations on the following areas of the project

(please put a ✓ in 1 of the following 2 ratings and provide comments)

Areas	*Rating*		*Comments and Recommendations*
	Satisfactory	*Needing attention*	
Overall financial management/ use of funding	✓		
Overall project progress	✓		
Outputs /deliverables / dissemination	✓		
Overall rating / comments on the project (Please suggest remedial actions if the rating is 'Needing attention')	✓		This is a very successful project which significantly improves our understanding of OBE and provides clear guidance of the way forward.

(b) Issues requiring the attention of FLTC/Dean of School and/or the funding authority

NIL

(c) Outputs/deliverables/good practices of the project that can be shared with other subjects, programmes or departments within the Faculty, or with the wider PolyU community

The reports by Dr Jacobsen should be shared among members of the Faculty of Engineering as they are particularly relevant to Engineering curricula and the implementation of OBE in the Engineering context.

(d) Additional comments/remarks

NIL

Name of ~~D/SLTC Chair~~ (or HoD/Dean of School): Prof. Michael Tse (in block letters) Date: 27/7/2011

^ *To be prepared by HoD/Dean of School if the PL is also the D/SLTC Chair, or if the Centre/Unit/Office does not have a DLTC.*

Part IV: Evaluation by FLTC/Dean of School#

(a) Overall rating on the project (please put a ✓ in 1 of the following 2 ratings):

☑ Satisfactory

☐ Needing attention

(b) Overall comments and recommendations on the project:

This is a very successful project. With the reports from and the experience shared by Dr Jacobson, the departments in FENG will definitely further improve their implementation of OBE and more fruitful outcomes will be achieved.

(c) Issues requiring the attention of the funding authority:

/

Name of FLTC Chair/ Dean of School: Kenneth Lam (in block letters) Date: 2 Aug 2011

 # The Dean of School or HoD of the Centre/Unit/Office needs not fill this part if he/she has already commented in Part III.

Part V: Response & Follow-up Plan by Project Leader

(Response and follow-up plan is required from the Project Leader if there is any area rated as 'needing attention' in Part III and/or IV.)

Name of Project Leader: _____ (in block letters) Date: _____

Signature of Project Leader	Signature of D/SLTC (or HoD)@	Signature of FLTC/ Dean of School
(Name in block letters)	(Name in block letters)	(Name in block letters)

@ To be signed by HoD if the PL is also the DLTC Chair, or if the Centre/Unit/Office does not have a DLTC; leave this blank if the PL is also the SLTC Chair.

The Project Leader and D/SLTC Secretary should each keep a copy of this *Completion Report* for records. A copy of this *Completion Report* will be submitted along with the *F/SLTC Annual Report (Form 20)* to LTC/WGOBE as a supporting document.

HONG KONG POLYTECHNIC UNIVERSITY

OBSERVATIONS ON PREPARATION FOR OUTCOMES BASED PROGRAMME DELIVERY AND EVALUATION

Ira D. Jacobson

MAY 2011

PROGRAMMES REVIEWED

- Product Analysis and Engineering Design
- Product Engineering with Marketing
- Scheme in Integrated Product Development
- Double Degree in Business Administration and Engineering
- Electronic and Information Engineering
- Internet and Multimedia Technologies
- Electrical Engineering
- Transportation Systems Engineering
- Mechanical Engineering
- Double Degree in Computing and Management
- Logistics and Engineering Management
- Industrial Quality Management
- Enterprise Engineering with Management

Documents Reviewed

Folder	Subfolders	Files	Type	Pages
COMP	COMP-61025	COMP 61025 (PT) 2010 DPD	Adobe	168
		COMP 61025 BA COMP (PT-SF) 2009-10 ARR	Adobe	12
		COMP-PLOAP-PT	Adobe	7
		LOAP-COMP-Degree(61025)-Sept 09	Adobe	17
	COMP-61031	COMP 61031 (FT) 2010 DPD	Adobe	325
		COMP 61031 BSc Scheme COMP (FT) 2009-10 ARR	Adobe	20
		COMP-61031 (FT) PLOAP-FT	Adobe	9
		LOAP-COMP-Degree(61031)-Sept 09	Adobe	22
	COMP-61032	COMP 61032 DD COMP & MGT (FT) 2009-10 ARR	Adobe	5

Documents Reviewed (cont.)

EE and EIE	EE-41070	EE 41070 (FT) 2009-10 ARR	Adobe	25
		EE 41070 (FT) 2010-11 DPD	Adobe	115
		LOAP-EE-41070	Adobe	10
		P_LOA_Report_41070_(2009-10)_Attachment	Adobe	22
		PLOAP_Interim_report_41070_revised_(2009-10)	Word	4
	EE-41080	EE 41080 (PT-SF) 2009-10 ARR	Adobe	13
		EE 41080 (SF-PT) 2010-11 DPD	Adobe	86
		LOAP-EE-41080 (PT)	Adobe	9
		P_LOA_Report_41080_(2009-10)_Attachments	Adobe	12
		PLOAP_Interim_report_41080_revised_(2009-10)	Word	4
	EE-41081	EE 41081 (FT) 2010-11 DPD	Adobe	98
		EE 41081 TSE (FT) 2009-10 ARR	Adobe	16
		LOAP-EE 41081 (not yet approved by FLTC) (Sept 20	Adobe	13
	EIE-42070	EIE 42070 (FT) 2009-10 ARR	Adobe	24
		EIE 42070 (FT) 2010-11 DPD	Adobe	271
		EIE-PLOAP_interim_report(27Aug2010)	Adobe	29
		LOAP -EIE-42070	Adobe	20
	EIE-42077	EIE 42077 (FT) 2010-11 DPD	Adobe	236
		EIE 42077 IMT(FT) 2009-10 ARR	Adobe	19
		EIE-PLOAP_interim_report(27Aug2010)	Adobe	29
		LOAP-EIE-42077	Adobe	15

Documents Reviewed (cont.)

FENG	FENG-5003	05003 IPD-PEM PLOAP interim report (2009-10)	Word	4
		FENG O5003 (FT) 2010-11 DPD	Adobe	234
		FENG O5003 IPD (FT) 2009-10 ARR	Adobe	24
		LOAP -FENG-05003-PAED	Adobe	22
		LOAP -FENG-05003-PEM	Adobe	11
		MELOAP 05003 2010	Word	2
	FENG-05004	FENG 05004 (FT) 2010-11 DPD	Adobe	49
		FENG 05004 -DD (FT)2009-10 ARR	Adobe	9
		LOAP -FENG 05004-FT DD (July 2010)	Word	6
		LOAP -FENG -05004	Adobe	2
		2010-11 FENG Degree Prorogrammes Checklist[1]	Adobe	2

Documents Reviewed (cont.)

ISE	ISE-02004	02004 LEM PLOAP_interim_report (2009-10)	Word	3
		ISE 02004 (FT) 2010-11 DPD	Adobe	209
		ISE 02004 LEM (FT) 2009-10 ARR	Adobe	7
		LOAP -ISE-02004	Adobe	10
	ISE-45083	45083 IQM PLOAP_interim _report (2009-10)	Word	3
		ISE 45083 (SF-PT) 2010-DPD	Adobe	126
		ISE 45083 IQM (PT-SF) 2009-10 ARR	Adobe	7
		LOAP -ISE-45083	Adobe	11
	ISE-45085	45085 ISE PLOAP_interim_report (2009-10)	Word	3
		ISE 45085 (FT) 2009-10 ARR	Adobe	8
		ISE 45085 (FT) 2010-11 DPD	Adobe	181
		LOAP -ISE-45085	Adobe	11
	ISE-45087	45087 Topup PLOAP_interim_report(2009-10)	Word	3
		ISE 45087 (SF-FT) 2010-11 DPD	Adobe	111
		ISE 45087 PEM (FT-SF) 2009-10 ARR	Adobe	8
		LOAP -ISE-45087	Adobe	10
	ISE-45090	45090 PEM PLOAP_interim_report (2009-10)	Word	4
		ISE 45090 (SF-PT) 2010-11 DPD	Adobe	117
		ISE 45090 PEM (PT-SF) 2009-10 ARR	Adobe	7
		LOAP -ISE-45090	Adobe	10
	ISE-45092	45092 EEM PLOAP_interim_report (2009-10)	Word	4
		ISE 45092 (FT) 2010-11 DPD	Adobe	181
		ISE 45092 EEM (FT) 2009-10 ARR	Adobe	6
		LOAP -ISE-45092	Adobe	11

Documents Reviewed (cont.)

ME	ME-43078	LOAP -ME-43078-	Adobe	16
		ME 43078 (FT) 2010-11 DPD	Adobe	177
		ME 43078 Beng (FT) 2009-10 ARR	Adobe	6
		MELOAP 43078 2010	Word	3
	ME-43091	LOAP -ME-43091(rev12Jan)	Adobe	13
		ME 43091 (PT-SF) 2009-10 ARR	Adobe	6
		ME 43091 (SF-PT) 2010-11 DPD	Adobe	131
		MELOAP 43091 2010	Word	5
	ME-43097	LOAP -ME-43097	Adobe	22
		ME 43097 (SF-PY)2010-11 DPD	Adobe	111
		ME 43097 PAED (PT) 2009-10 ARR	Adobe	7
		MELOAP 43097 2010	Word	2

OVERALL COMMENTS

- **Programmes appear to understand the concepts involved in outcomes approach to programme design and evaluation.**
- **Objectives, in general, well stated and consistent with mission of University.**
- **Outcomes for programmes are generally well stated.**
- **Initial evaluations appear to be underway.**

GENERAL SHORTCOMINGS

- **Not enough discussion on how objectives and outcomes were determined. Specifically, little discussion of constituent groups and how they were involved. (Seems to be mainly faculty driven with little or no external input)**
- **Identifying where the evaluation of programme outcomes is done is sometimes difficult to determine. Some confusion between SUBJECT outcomes and PROGRAMME outcomes.**
- **Little validation of assessment percentages is evident. No description of how to determine the validity of initial assessment goals is evident (benchmarking).**
- **Supporting material for external input not always evident.**

SOME EXAMPLES OF POORLY WRITTEN SUBJECT FORMS

MM2021 Management and Organisation

Identifies Programme Outcome contribution

Role and Purposes	**This subject contributes to the achievement of the BBA (Hons) Programme Outcomes by enabling students with an understanding of management functions, group and individual dynamics within organisations and to apply such concepts to analyse and solve problems in business situations (Outcomes 7 and 11). The subject also provides students with knowledge and skills in leadership, teamwork, and decision making (Outcome 8). In addition, it prepares students on how to analyse and resolve ethical issues in various business settings (Outcome 5).**
Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** **a. explain the nature of managerial work in a variety of forms of organisations, and analyse the impact of the external environments, both domestic and global, on managers' jobs (Outcome 7);** **b. explain and analyze the functions of management in organisations, i.e. planning, organising, leading, and controlling (Outcomes 7 & 11);** **c. apply the essence of human behavior in teamwork, leadership, and decision making and evaluate the implications for the management of organisations (Outcomes 8 and 11);** **d. analyse and compare the arguments surrounding social responsibility and ethical behavior in organisations and businesses (Outcome 5).**
Subject Synopsis/ Indicative Syllabus	**Management Functions** **The major elements of the management functions: planning, organising, leading, and controlling, and their importance for the effective management of business organisations.** **Planning** **Foundations of planning. Decision making and problem solving. Global business environment. Strategic management.** . . .

ME2904 Project

Is this the methodology, or is it the syllabus?

Teaching/ Learning Methodology

This is an introductory course aiming at arousing students' awareness in multiple issues encountered in product design and development. It also aims at developing interest and curiosity in all relevant subsequent subjects. It is not the intention of the subject to pre-empt any specific topic that is to follow. In addition to the traditional classroom lectures, small-group discussion will be used extensively. In fact, the intended outcomes are best achieved through real feelings and understandings derived from the design project. Teaching and learning of the subject can be implemented by going through the following suggested study plan:

Week 1 Hand sketching as design/communication tool (SD)
Week 2 Photo and video making as design/communication tool (SD)
Week 3 Product aesthetics as demonstrated through hand sketching or photo (SD)
Week 4 Dissatisfaction and market need – introduction of a design problem and development of design criteria; project planning and management (ME)
Week 5 Methods to recognize market needs and define problems and gather information including market survey (SD)
Week 6 Generation of alternative concepts and the use of design logbook (SD)
Week 7 Oral presentation on alternative design concepts (by SD/ME/Peer)
Week 8 Oral presentation on alternative design concepts (by SD/ME/Peer)
Week 9 Evaluation of alternative design concepts by considering materials and manufacturing processes used, as well as other factors such as costs, environment and safety issues (ME)
Week 10 Methods to assess alternative design concepts and selection of the best design concept by considering the roles of engineering sciences and CAD/CAE (ME)
Week 11 Prototype making of the preferred design and preparation of final report (ME)
Week 12 Prototype making of the preferred design and preparation of final report (ME)
Week 13 Oral presentation on final product with the aid of the prototype (by SD/ME/Peer) and submission of the final report (ME)
Week 14 Oral presentation on final product with the aid of the prototype (by SD/ME/Peer) and submission of the final report (ME)

Objectives	This is the first bridging course in physics of the Foundation Programme for students admitted from mainland. It provides a broad foundation in mechanics and thermal physics, preparing students to study science, engineering, or related programmes.
Intended Subject Learning Outcomes There are more ILOs than Syllabi items	Upon completion of the subject, students will be able to: 1. solve simple problems in single-particle mechanics using calculus and vectors; 2. solve problems in mechanics of many-particle systems using calculus and vectors; 3. solve problems on rotation of rigid body about fixed axis; 4. define simple harmonic motion and solve simple problems; 5. explain ideal gas laws in terms of kinetic theory; 6. apply the first law of thermodynamics to simple processes; 7. solve simple problems related to the Carnot cycle; 8. solve simple problems in travelling waves; 9. explain the formation of acoustical standing waves and beats; and 10. use Doppler's effect to explain changes in frequency received.
Subject Synopsis/ Indicative Syllabus	Keyword Syllabus: 1. Preparation in Mathematics Review of algebra, geometry and trigonometry; Function and graph; Derivative; Integration; Vectors and coordinate system. 2. Mechanics Calculus-based kinematics, dynamics and Newton's laws; Calculus based Newtonian mechanics, involving the application of impulse, momentum, work and energy, etc.; Conservation law; Gravitation field; Systems of particles; Collisions; Rigid body; Rotation; Angular momentum; Oscillations and simple harmonic motion; Pendulum; Statics and elasticity. 3. Thermal Physics Conduction, convection and radiation; Black body radiation and energy quantization; Ideal gas and kinetic theory; Work, heat and internal energy; First law of thermodynamics; Entropy and the second law of thermodynamics; Carnot cycle; Heat engine and refrigerators. 4. Waves Longitudinal and transverse waves; Travelling wave; Doppler effect; Acoustics.

EE4261 Fibre Optics

Objectives	**Objective** **1. To introduce to students the physical laws that govern the behaviour of fibre-optics components.** **2. To give students an understanding of the principles of fibre-optic sensing and optical fibre communications.** **3. To equip students with the knowledge to design simple fibre-optics sensor systems.**
Intended Learning Outcomes	**Upon completion of the subject, students will be able to:** **a. Appreciate recent developments in fibre optic communication systems.** **b. Appreciate the important of fibre optics technology to the development of communications and fibre-optic sensors.** **c. Appreciate the effect of attenuation and dispersion of optical fibres to the performance of a fibre optic system.** **d. Apply fibre optic sensors for temperature and strain measurement.** **e. Select the most appropriate passive and active fibre-optic components for fibre-optic sensor systems and fibre optic communication links.** **f. Use the appropriate fibre-optic equipment/instrument to perform optical power and spectrum measurements.** **g. Have had hands-on experience in the use fusion splicer to make low-loss fibre joints.** **h. Appreciate the engineering applications of fibre-optics technologies.** **i. Appreciate the importance of optical fibre communications from a historical perspective.** **j. Interpret the physical meaning and phenomena behind mathematical equations and computed results.**

Are these ILOs or A syllabus?

CONSISTENCY

- Need to be consistent in subject descriptions on what is the syllabi, the outcomes and the objectives.

- Have a consistent way to identify what the actual measurements are for each programme outcome. Either embed it in your existing descriptions or provide an appendix. If a rubric is used, what is it?

- It would be advantageous for the subject descriptions to indicate how they are used to satisfy the programme outcomes.

ASSESSMENT ISSUES

INTERNAL ASSESSMENT OF PROGRAMME OUTCOMES

FACULTY NEED TO DECIDE WHAT IN THEIR PROFESSIONAL JUDGEMENT IS A SUFFICIENT LEVEL OF ACCOMPLISHMENT TO SATISFY A PARTICULAR PROGRAMME OUTCOME (THEY DO NOT ALL HAVE TO BE THE SAME)

FOR A SUBJECT THAT IS GOING TO BE USED TO ASSESS A PROGRAMME OUTCOME, THE FACULTY MEMBER IN CHARGE GETS TO DECIDE FOR EACH STUDENT WHETHER THEY HAVE ATTAINED THE APPROPRIATE LEVEL FOR THE PROGRAMME OUTCOME(S) MEASURED IN THEIR SUBJECTS. THEY MAY USE EITHER DIRECT MEASUREMENTS IF THEY EXIST OR A RUBRIC. PROFESSIONJAL JUDGEMENT IS AN ACCEPTABLE METHOD.

THE CONCERN THAT SOME FACULTY MEMBERS MAY BE EASY GRADERS AND OTHERS HARDER WILL BE TAKEN CARE OF WHEN THE ASSESSMENT IS BENCHMARKED. FOR MULTIPLE FACULTY SUMMING OR AVERAGING DEPENDING ON THE METHOD OF ASSESSMENT IS APPROPRIATE.

HOW GOOD IS GOOD ENOUGH?

- Where do %s come from? Who decided and how? Is there documentation?
- What exactly was measured – not just subject in which it was measured?
- What exactly are the rubrics being used?

3 An ability to apply knowledge of arts, mathematics, sciences and engineering, via analytical, computational or experimental approaches, to analyze or predict the performance of a design in the life cycle of product development.			The following subjects were selected to assess this programme outcome. 1.ME3306 Product Modelling, Simulation and Analysis 2.ME4303 Product Testing Technology This programme outcome was considered to be achieved if more than 88% of students taking the subjects were identified meeting the outcome assessment criteria. How was this done, and where did the 88% come from? This programme outcome was completely achieved in ME3306 but marginally achieved in ME4304.

ISE

Need more detail or reference to more detail

3. To have gained some experience and developed the ability in analyzing the market situation and competition environment, identifying market needs and converting them into new product that satisfy customer needs.		(a) ISE445 Capstone Project In this subject, each student is required to apply knowledge and skills learnt from the programme to solve engineering problems related to his project. (b) ISE430 New Product Planning and Development The subject lecturer evaluates the performance of students using **three assessment methods: a conjoint analysis assignment, two target questions in a test, and laboratory exercises.** (c) Exit Survey An exit survey was conducted during April-May 2009. Respondents were graduates of 2008/2009. A 5-point scale with 3 representing 'Adequate' and 5 representing 'Very much' was adopted. **Criterion for success:** **At least 85% of the assessed students are rated as Fully Met/Satisfactory/Adequate or above).**	(a) **100% of the assessed students are rated as 'Fully Met' or above.** (b) After assessment, **89.0% of the assessed students are considered to be able to appreciate the generation of product concepts to satisfy the customer needs; 85.2% of them are considered to be able to identify new product opportunities; and 92.6% of them are considered to be able to explore and analyse the market needs, and appreciate their relationship with new products.** **(c) It is calculated that about 92% of the respondents gave the feedback of 3 or above to the questions related to this programme outcome.** **Based on the above findings and the criteria for success, this programme learning outcome has been achieved. The results will be shared with the related teaching staff and the undergraduate programme committee.**

Until benchmarking is done you only know that you have reached your own internal assessment goal.

RELATIONSHIP OF SUBJECT OUTCOMES TO PROGRAMME OUTCOMES

EXAMPLE METHOD FOR RELATING SUBJECT AND PROGRAMME OUTCOMES

Subject Code	MM2711
Subject Title	Introduction to Marketing
Role and Purposes	This core subject introduces the basic principles and concepts of Marketing. It provides an analytical foundation for further study of Marketing and also contributes to the BBA Programme Outcomes in two ways. First, the content directly addresses the creation of value (Outcome 10), ethics (Outcome 5), cultural diversity and globalization (Outcome 3). Second, the classroom activities and assessments develop students' teamwork, ability to communicate in English, analyse business situations by applying relevant conceptual frameworks (Outcomes 7 and 12) and creative thinking (Outcome 4).
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Analyse diverse marketing situations and identify marketing opportunities and threats (Programme Outcomes 3, 7 and 12); b. Apply marketing theories and models to practical marketing situations (Programme Outcome 12); c. Evaluate ethical issues from a marketing perspective and suggest appropriate actions (Programme Outcome 5); d. Analyse and/or suggest ways to create value in goods and services and deliver these to customers (Programme Outcomes 4 and 10); e. Critically select and manage information, develop and present coherent arguments on marketing.

EXAMPLE METHOD FOR RELATING SUBJECT AND PROGRAMME OUTCOMES

Course Outcomes: Upon successful completion of this course, the student shall be able to:

1.Apply learned fundamental elements of computer architecture to hardware design an functional analysis.
2.Understand and appreciate various organizational models and design decisions that determine the overall performance, capabilities, and limitations of a computer system.
3.Clearly understand the interdependencies among assembly languages, computer organization, and design.

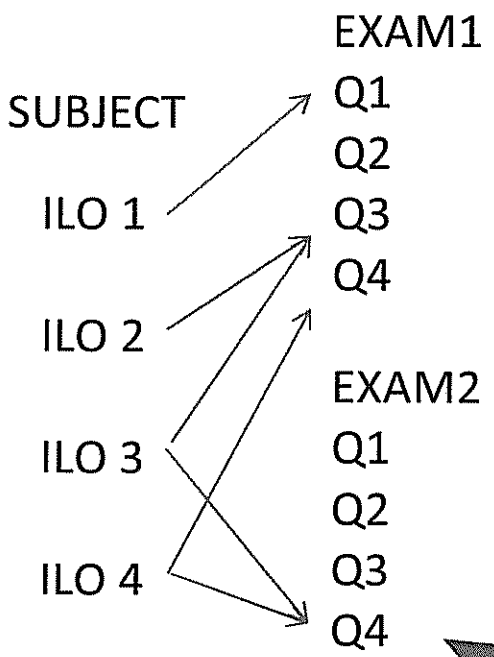
RELATIONSHIP BETWEEN COURSE OUTCOMES AND PROGRAM OUTCOMES (**S=STRONG, M=MODERATE**)

		PROGRAM OUTCOMES										
		A	B	C	D	E	F	G	H	I	J	K
COURSE OUTCOMES	1	S		S						S	S	
	2		S	S		M				M	S	S
	3	M		S								

FROM: http://csci.ecst.csuchico.edu/assessment/documents/reports/Draft%20CSCI%20SSR%202009-0501.pdf

REVIEW THE FLOW

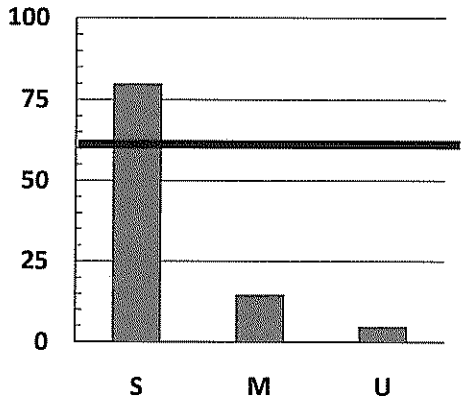
POSSIBLE FLOW DIAGRAM OF PROCESS



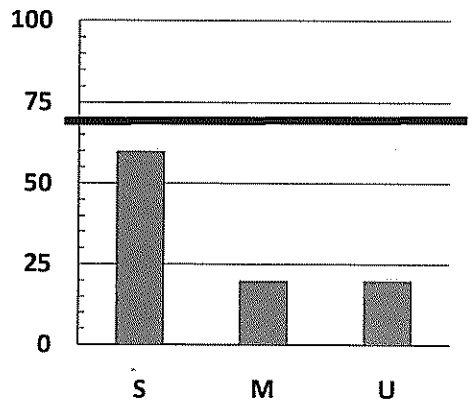
	Exam1						Exam2						Programme Outcomes	
Student	Q1	Q2	Q3	Q4	Total	Grade	Q1	Q2	Q3	Q4	Total	Grade	P1	P4
a	25	0	15	20	60	C	20	15	25	0	60	C	S	U
b	15	15	25	25	80	B	25	25	15	15	80	B	S	S
c	18	10	20	15	63	C	15	20	18	10	63	C	S	S
d	20	20	24	18	82	B	18	24	20	20	82	B	S	S
e	10	25	12	20	67	C	20	12	10	5	47	D	U	U
f	0	15	15	20	50	D	20	15	0	15	50	D	U	S
g	20	25	20	25	90	A	25	20	20	25	90	A	S	S
.													direct	Prof. Judge
.														
.														

SILOs	PILO 1	PILO 4
ILO1	X	
ILO2		X
ILO3		X
ILO4		X

Percent Satisfactory P1

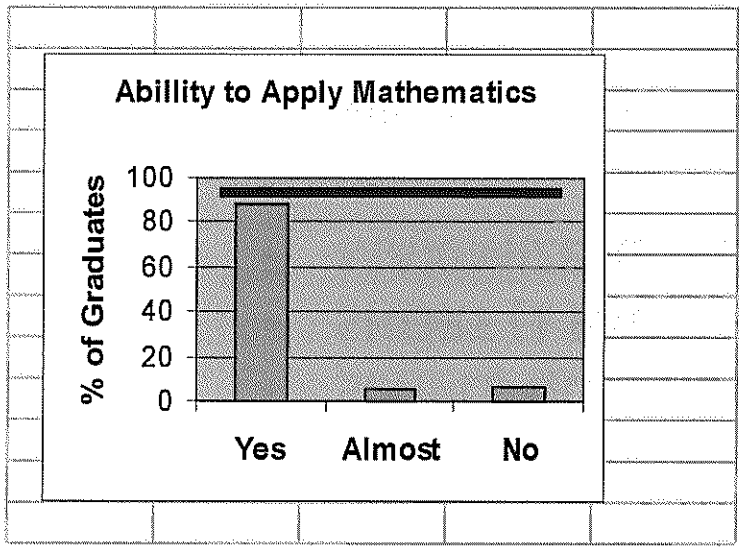


Percent Satisfactory P4



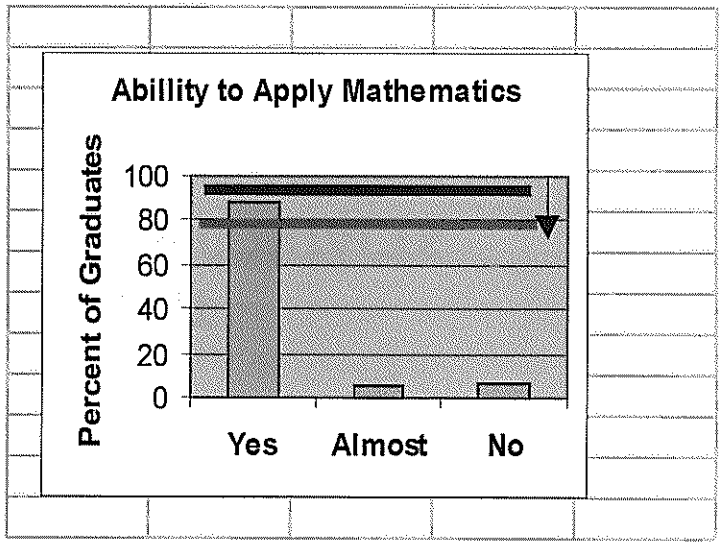
BENCHMARKING

CONSTITUENT INPUT ON ADEQUACY OF GRADUATE ABILITIES ON PROGRAMME OUTCOMES

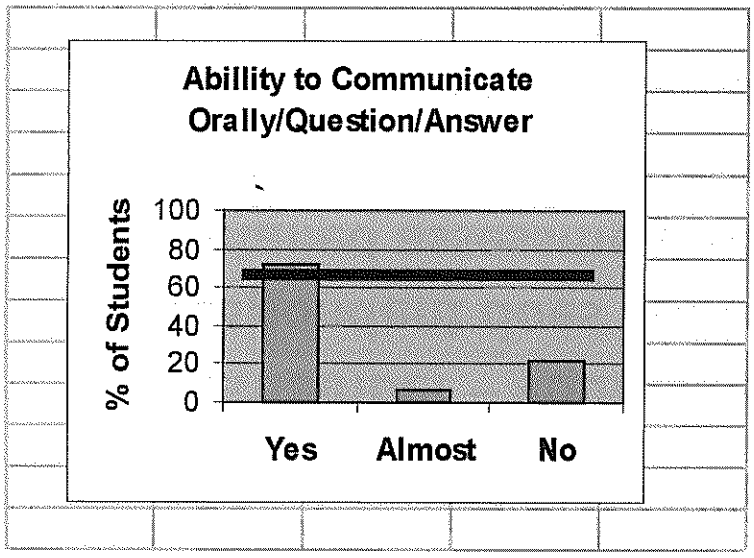


Survey of Alumni

- mathematics ability excellent
- difficulty initially meeting employer expectation in oral communication in English

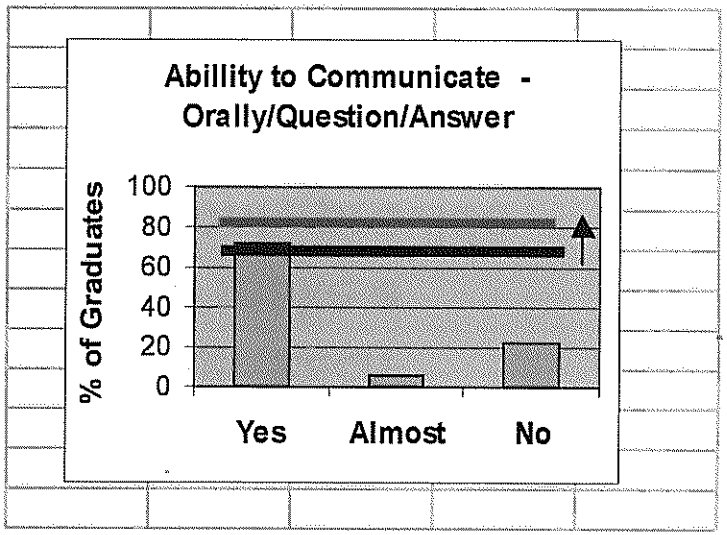


MODIFIED BENCHMARKS
AFTER CONSTITUENT INPUT



Survey of Employers

- mathematics ability excellent
- difficulty with English oral communication



SURVEYS – SOME THOUGHTS

Remember – your external input is for benchmarking. Each respondent does not have a large enough sample to make a detailed assessment of your programme. They can only provide an assessment of whether or not the graduates that they have come in contact with are sufficiently prepared to satisfy them. The same is true of your alumni. They can only know how well they are prepared for the demands that are being placed on them.

1. **DON'T OVERDESIGN**
   - **SIMPLE QUESTIONS**
   - **SHORT (1 PAGE) – FOLLOW UP IF PROBLEMS EXIST**
   - **MAXIMIZE RESPONSE RATES BY USING FAMILIAR CONTACTS**

2. **ALUMNI ARE ALSO EMPLOYERS AFTER THEY HAVE BEEN OUT FOR AWHILE**

3. **USE YOUR INDUSTRY ADVISORY COMMITTEE MEMBERS**

4. **YOU HAVE OTHER COSTITUENTS (E.G. GRADUATE SCHOOL FACULTY)**

FEEDBACK LOOP – IDENTIFYING PROBLEMS AND FIXING THEM

COMP

Improvement Actions

In the space below, please provide any improvement actions taken/planned based on the assessment results, and if needed, their explanatory comments:

This is the first round of doing this LOAP and we find that there is a long way to go. Our general observation is that our lecturers consider that most of our students pass the criteria being assessed and students themselves think that they pass those criteria. However, our students are found to be weak in communication and leadership. Since there is no specific language requirement or training subject in this top-up self financed degree, there is not much that we could do, without imposing extra workload on the students.

A most important step to improve is the evaluation of course embedded assessment (CEA). We observe that our subject lecturers are in general very lenient on evaluating our students, though we had repeatedly mentioned about the failure of a student in a certain outcome does not necessarily mean a failure in the subject. We would like to feed back the results of CEA and employer survey back to our staffs, so as to tune better their expectation on the student's ability. Our initial benchmark is also set on the low side for CEA.

Issues and Difficulties

In the space below, please write down any issues and difficulties encountered:

The employers survey was coordinated by Faculty for full-time programme and it is hard to perform that one for Part-time program. We would need to coordinate our effort in the survey by combining with MSc programmes, which will also undergo OBE in the coming year. Without the indicative employer survey, which points to most of the problems in the full-time programme, we do not see too many problems as easily from the relatively lenient assessment by the subject lecturers. We do not anticipate much problem from the self-assessment of our students upon graduation and as alumni, except for presèntation and communication skills, and possibly teamwork, based on our past experience. The lack of good survey results also makes the LOAP assessment less useful.

CONCLUSIONS

1. OVERALL PROCESS FAIRLY WELL UNDERSTOOD

2. DOES NOT APPEAR THAT EXTERNAL CONSTITUENTS WERE USED TO GIVE FEEDBACK FOR DEFINING INITIAL OBJECTIVES AND OUTCOMES

3. INITIAL ASSESSMENT GOALS DETERMINED BUT NOT WELL DOCUMENTED

4. SUBJECT DESCRIPTIONS NEED MORE CONSISTENCY RELATIVE TO LEVEL OF OBJECTIVES, OUTCOMES AND SYLLABI

5. SOME FACULTY ARE INCORRECTLY USING COURSE GRADES AS MEASURES OF ATTAINING PROGRAMME OUTCOMES

6. BENCHMARKING IS SPOTTY AND NOT WELL UNDERSTOOD

7. NOT A LOT OF EVIDENCE OF A FEEDBACK IMPROVEMENT PROCESS

Observations on Implementation of Outcome-based Education

in

Department of Computing

The Hong Kong Polytechnic University

Prepared by

Professor Ira Jacobson

12 May 2011

A review has been made on the OBE-related documentation of the COMP programmes[1], including

(a) Definitive Programme Document 2010-11 **(DPD)**;

(b) Learning Outcomes Assessment Plan **(LOAP)**;

(c) PLOAP Interim Report 2010-11 **(PLOAP)**; and

(d) Annual Programme Review Report 2009-10 **(APRR)**.

My comments on the documents are as follows:

BA (Hons) in Computing (PT-SF) (Code : 61025)

(Document reference : DPD)

1. Agree with the multiple language desire. How do overseas non-chinese speaking students deal with the Chinese language requirement? The programme document should spell out clearly & explicitly the exemption policy for these students.

2. The DPD mentions two types of assessment - continuous and examination. How about other types of assessment such as projects, laboratories, work experiences, tests, etc? These should be written explicitly in the programme document.

3. The subject descriptions have good linkage to the programme outcome.

(Document reference: APRR)

4. A good analysis of what numbers mean, but without employer feedback there is no basis for knowing whether your percentages are correct.

5. The conclusion that there is not much you can do without putting extra workload on students (page 7) is a poor response. Dept should think of a rational way to deal with it, such as by introducing a session for students to work as team in class instead of the normal practice of assigning a group project, or simply taking ½ credit off the 3-credit hours.

6. Agree with the feedback of the employer results to the faculty.

(Document reference: P-LOAP)

7. Same comment as above.

(Document reference: LOAP)

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[1] These include:
BSc(Hons) Scheme in Computing (FT-UGC) (Code: 61031)
Double Degree in Computing and Management (FT-UGC)(Code: 61032)
BA(Hons) in Computing(PT-self-financed)(Code: 61025)

8. Need way to validate percentages.

9. The emphasis on communication in the programme is a good idea.

10. An unacceptable statement in the document, it says " ..there is not much we can do about it when outcome isn't met...".

BSc(Hons) Scheme in Computing (FT-UGC) (Code : 61031)

(Document reference: DPD)

11. Chinese/English issue. The document should spell out clearly the exemption policy for non-native Chinese speakers.

12. The subject description forms should show how the subject fits with the programme learning outcomes. Since the subject ILOs are being offered to show that the programme outcomes are met, it would be useful in the subject descriptions to indicate where this is happening.

(Document reference: APRR)

13. How will you measure management outcomes if surveys don't provide information (page 8)?

14. Percentages – How will the Department validate and calibrate these?

(Document reference: P-LOAP)

15. You have to find a way to calibrate the way in which students are evaluated by the faculty. It needs to be brought in line with employer expectations.

16. It is crucial to benchmark the initial estimate with employer/alumni survey.

(Document reference; LOAP)

17. Same comment as above.

<u>Other observations</u>

Constructive alignment of subject outcomes and assessment methods

18. Grades are not a good indicator of achieving a programme outcome.

19. Colleagues are recommended to do away with pure mathematical model in assessing subject outcomes, but to adopt a rubric approach and apply their professional judgment on how well a student has fulfilled a specific programme outcome based on his/her overall performance on the subject. After all, this is merely an internal assessment, result of which has to be externally validated by employer/alumni surveys as a feedback mechanism.

20. Subjects are just vehicles to fulfill the programme outcomes. They would be replaced gradually over time if they are found irrelevant to the programme outcomes.

21. The measurement/survey conducted on Years 1 & 2 students might be too early as this group of students haven't academically matured yet. Hence, the result might be over-measuring.

Exit Survey

22. The survey questionnaire should consist of short questions with a 3-point scale. An effective survey form should not exceed one page.

23. Sending personalized emails would be an effective way to improve the response rate of the survey. As graduates have better acquaintance with their final year project supervisors, they would be more willing to reply if the invitation emails are sent from their supervisors.

24. Keeping in touch with graduates on a regular basis with email to obtain a quick response from them about their career status is a good way to improve the response rate in the actual survey, in particular those alumni graduated 5 years or more ago. This group of alumni could also be the employers of your current batch of graduates!

25. The questionnaire should aim at asking alumni how well the programme has prepared students to function sufficiently instead of how the curriculum should be revised.

26. Departments should identify different constituencies served by a programme and take the different inputs together to make logical decisions.

Observations on Implementation of Outcome-based Education

in

Department of Electrical Engineering

The Hong Kong Polytechnic University

Prepared by

Professor Ira Jacobson

May 2011

A review has been made on the OBE-related documentation of the EE programmes[1], including

(a) Definitive Programme Document 2010-11 **(DPD)**;
(b) Learning Outcomes Assessment Plan **(LOAP)**;
(c) PLOAP Interim Report 2010-11 **(PLOAP)**; and
(d) Annual Programme Review Report 2009-10 **(APRR)**.

My comments on the documents are as follows:

BEng(Hons) in Electrical Engineering (FT-UGC) (Code: 41070)

(Document reference: APRR)

1. Well thought through analysis of performance. Do the dissatisfaction numbers mean that the % is too low or that the evaluation of the faculty too forgiving? How are you validating benchmark %'s? The documentation lacks a rational process on how the initial percentage for measuring success is being determined. It does not matter whether the initial number is correct or not, the department has to validate it with employer/alumni surveys eventually. If the internal assessment shows that a specific programme outcome is successfully attained, while the opposite is concluded from external validation, it implies that either the initial estimate is too low or colleagues are too lenient in making the judgement. If there are shortfalls identified, instead of asking colleagues to adjust their grading which implies interfering with their academic freedom, departments should increase assessment bar (%) and then go back to review the table of mapping between subjects and programme outcomes to identify what adjustment can be done on the curriculum to address the deficiencies. But please bear in mind that there are ample options available, other than simply adding a 3-credit subject to the curriculum, to fix the problem.

2. A programme is not designed to fulfil the needs of only one group of graduates. For instance, while most graduates would work in industry, some would pursue further higher education. In other words, there are different constituencies a programme is serving. So when seeking external opinions as a feedback mechanism, the department has to identify the different

[1] These include:
BEng(Hons) in Electrical Engineering (FT-UGC) (Code: 41070)
BEng(Hons) in Transportation Systems Engineering (FT-UGC)(Code: 41081)
BEng(Hons) in Electrical Engineering (PT-self-financed)(Code: 41080)

constituencies and take the different inputs together to make logical decisions.

(Document reference: DPD)

3. (Page 5) 'Aims and Rational' – good. Suggested rewording slightly to 'The programme aims to produce students with ….' (provide implies what you do, not what they do)

4. (Page 7) 'Programme Objectives' – well done. Small number that is easily relatable to aims and to outcomes.

5. (Page 7) 'Programme Outcomes' – good. One question is how will you handle non-Chinese speaking students who want to pursue a degree but are not native? The document should spell out clearly the exemption policy for non-native speaker in Chinese.

6. (Page 24) 'Assessment Method' – only have continuous assessment (CA) and examination (EXAM). What is a lab report? What is the learning portfolio? How about work experience? Can there be any other types of assessment? Course descriptions indicate that there are. I understand that students' performance on CA and EXAM contributes to the overall subject grade. But OBE assessment covers more than these two components. Recommended to put an '*' to elaborate that *'For evaluating outcomes, other than CA and EXAM, other types of assessment like .....) would be used'*.

7. Subject descriptions well done. Occasional over detail of learning outcomes (for example, in EE4261, ILOs are just repeating the syllabus part). The subject descriptions don't show how the subject fits in with the programme learning outcomes. Since the subject ILOs are being offered to show that the programme outcomes are met, it would be useful in the subject descriptions to indicate where this is happening. Teaching staff and students would find it helpful to know the relationship between the subject and the programme outcomes.

(Document reference: LOAP)

8. Where do %'s come from and how will you validate them? [as discussed in para. 1 above]

9. Spacing evaluation is a good idea.

(Document reference: PLOAP_interim_report_41070_revised)

10. Is the benchmark being revisited the issue, or is the lack of enough students meeting it the

issue? The benchmark of spoken Chinese (Putonghua) needs to be reviewed. Personally, I am not convinced that language ability can be improved by courses. For languages, 'one either uses it or loses it'. Same for the degrading in English language proficiency of the secondary local students, a concern for all engineering programmes.

(Document reference: PLOAP_report_41070_attachments)

11. Where do %'s come from? Conclusions good, but need to validate whether result meets the needs of industry. [as discussed in para. 1 above]

12. Employer evaluation of adequacy excellent – what are you doing with it?

(Document reference: PLOAP_report_41070_revised)

13. Would be nice if this included actions that would be needed based on result – e.g. only 32% meet spoken language in Putonghua. See comment above on how languages are learned.

BEng(Hons) in Electrical Engineering (PT-self-financed)(Code: 41080)

(Document reference: APRR)

14. (Page 4) Drawing conclusions on what needs improvement is good.
15. (Page 6) Action plan does not seem to provide any ideas for how to improve.
16. Where do %s come from? How do you validate? [as discussed in para. 1 above]

(Document reference: DPD)

17. Not always easy to see relationship of subject outcomes to programmes outcomes.

(Document reference: LOAP)

18. See comments of 41070 above

(Document reference: PLOAP_interim_report_revised)

19. Good.

(Document reference: PLOAP_report_attachments)

See above.

BEng(Hons) in Transportation Systems Engineering (FT-UGC)(Code: 41081)

(Document reference: DPD)

20. Same comment on assessment methods as above.
21. Same comments as 41070

(Document reference: LOAP)

22. See above.

Other observations

Constructive alignment of subject outcomes and assessment methods

23. Similar to some other departments, EE has started to work on subject level outcome assessment, which, due to some inherent difficulties, is a challenging task. It is not easy and not necessarily doable to work out a constructive alignment between subject outcomes and assessment unless the subject ILOs are independent variables. But the chance of having the latter is slim for engineering programmes because engineering is an integrated profession. The higher the subject level, the higher degree of integration it requires. Hence, a one-to-one relationship between an examination/test question and a subject ILO is difficult to create, especially with advanced subjects. That's why colleagues find it so frustrating to align subject ILOs with examination questions in a quantitative way.

24. Colleagues are recommended to do away with pure numerical models

25. .0 in assessing subject outcomes, but to adopt a rubric approach and apply their professional judgment on how well a student has fulfilled a specific programme outcome based upon his/her overall performance on the subject. After all, this is merely an internal assessment, result of which has to be externally validated by employer/alumni surveys as a feedback mechanism.

26. Subjects are just vehicles to fulfill the programme outcomes. They would be replaced gradually over time if they are found irrelevant to the programme outcomes.

Overall grade should not be used for assessing programme outcomes

27. Apart from the misleading grade descriptions (C Grade), the overall grade is never a correct measure of programme outcomes unless there is a one-to-one relationship between subject ILOs and examination/test questions. The department has done a good job in decoupling grades and outcome assessment.

External surveys

28. External surveys are important tools to validate the initial estimate on the measure of success in outcome assessment. However, departments always feel disappointed with the response rate received. As a matter of fact, a response rate of 10 – 15% is not unusual. Even with intensive follow-up actions, 25% is a lucky result already. So avoid having unrealistic expectation on external surveys.

29. Departments are encouraged to look for more productive ways to conduct the surveys. For example, sending personalized emails helps improve the response rate. As graduates have better acquaintance with their final project supervisors, they would be more willing to reply if the invitation email is sent from their supervisors. Keeping in touch with graduates on a regular basis with email to obtain a quick response from them about their career status is a good way to improve the response rate in the actual survey. Besides, don't forget that alumni graduated 5 years ago can also be employers of your current batch of graduates as well. They can serve both functions.

30. Avoid asking employers/alumni how the curriculum should be revised, but whether the programme has prepared students sufficiently. Follow up with them only if you have no idea why there are such deficiencies.

31. Keep the initial survey very short. Lengthy surveys with questions breaking down into many small parts deter responses. An effective survey form should not exceed one page.

Observations on the Implementation of Outcome-based Education in Department of Electronic and Information Engineering, The Hong Kong Polytechnic University

Prepared by

Professor Ira Jacobson

3 May 2011

Having review the Annual Programme Review Report, the Programme Booklet and the Programme Learning Outcomes Assessment Plan (P-LOAP) of the BEng (Hons) in Electronic and Information Engineering (Programme Code: 42070) and the BSc (Hons) in Internet and Multimedia Technologies (Programme Code: 42077) programmes, I have the following comments:

A. BEng (Hons) in Electronic and Information Engineering Annual Programme Review Report (APRR) (2009-10)

On page 5 of the APRR, it is noted that the average monthly salary of the graduates is going down. What is the reason behind this? On page 10 of the APRR, two batches of students with low grades are shown. What are the concerns of the Department about the low grades for these batches of students? Also, on page 13 of the APRR (page 1 of Appendix III (42070)), a number of percentages are presented here. Where do the percentages come from?

B. BEng (Hons) in Electronic and Information Engineering Programme Booklet (2010-11)

On page 15 of the Programme Booklet, it is stated that "CBS's entrance test on Putonghua and HKCEE Putonghua subject shall be adopted as the benchmarking mechanisms for assessing students' general levels of Putonghua proficiency upon admission". What will happen if someone comes from England or Australia and does not speak Putonghua? Will the Department require the student to have the same level of competence as those of the local students?

There are also some "Intended Subject Learning Outcomes" which read like a syllabus. For example, on page 73 of the Programme Booklet, the Intended Subject Learning Outcomes of "AP101 College Physics I" are more like syllabus than learning outcomes.

C. BEng (Hons) in Electronic and Information Engineering Programme Learning Outcomes Assessment Plan (P-LOAP)

On page 1 of the P-LOAP, the programme mission/ goals are stated as follows:

(i) This programme aims at producing graduates with the professional knowledge and skills that are relevant for a professional engineer to contribute to the electronic and information engineering profession.

(ii) The curriculum enables the students to develop a deep understanding of sound scientific principles, and to gather experience in practical applications.

(iii) The learning and teaching environment is flexible and relevant to support both professional and all-rounded developments of the students.

(iv) The graduates will be able to develop abilities in effective communication, problem-solving, inquisitiveness, critical and creative thinking, and life-long learning.

(v) The graduates are expected to be equipped with professional competence, all-rounded attributes and transferable skills, and be able to meet challenges from the rapidly changing engineering profession.

Point (i) above has already implied a set of required outcomes including abilities in effective communication, problem-solving, inquisitiveness, critical and creative thinking, and life-long learning, a deep understanding of sound scientific principles, and to gather experience in practical applications, professional competence, all rounded attributes and transferable skills, and be able to meet challenges from the rapidly changing engineering profession, with professional competence, all-rounded attributes and transferable skills, and be able to meet challenges from the rapidly changing engineering profession. It may not be necessary to spell out in detail as points (ii) to (v). The above is too low level for a mission/goal. (i) is good enough. (ii) to (v) are outcomes.

For point (ii) above, the term "programme" should be used instead of "curriculum", since using "curriculum" would exclude out of class experiences.

Also, from page 2 to page 18 of the P-LOAP, a number of percentages are presented here. Where do the percentages come from and how will the Department validate these?

D. BSc (Hons) in Internet and Multimedia Technologies Annual Programme Review Report (APRR) (2009-10)

From page 10 to page 18 of the APPR (page 1 to page 9 of Appendix I (42077)), a number of

percentages are presented here. Where do the percentages come from? Also, on page 12 of the APPR (page 3 of Appendix I (42077)), why is outcome 13 "Realize and appreciate cultural diversity and globalization" gone?

E. BSc (Hons) in Internet and Multimedia Technologies Programme Booklet (2010-11)

On page 3 of the Programme Booklet, it is noted that the career paths of the programme do not include going to graduate school. Besides, the all-roundedness attributes seem to vary from one programme to another. Why is it the case if the all-roundedness attributes is a University driven need?

Similar to the 42070 programme, on pages 10 and 11 of the 42077 Programme Booklet, it is stated that "CBS's entrance test on Putonghua and HKCEE Putonghua subject shall be adopted as the benchmarking mechanisms for assessing students' general levels of Putonghua proficiency upon admission". What will happen if someone comes from England or Australia and does not speak Putonghua? Will the Department require the student to have the same level of competence as those local students?

F. BSc (Hons) in Internet and Multimedia Technologies Programme Learning Outcomes Assessment Plan (P-LOAP)

On page 1 of the P-LOAP, the following programme mission/ goals are stated. It is a combination of preamble (why the mission is what it is), a mission (or aim), a set of outcomes, and a list of career paths (that I do not think is necessarily all inclusive). You need to develop a hierarchy to simplify this. First objectives, then outcomes.

> Internet and multimedia technologies are among the key technologies that support the economic growth worldwide. Products with multimedia features such as digital cameras, personal digital assistants, 2G/2.5G mobile phones with built-in cameras, 3G mobile phones, are in great demand and new models are being developed almost everyday. Moreover, with the increasing popularity of wired broadband communications and wireless 2.5G/3G mobile communications, more and more multimedia contents are being created, delivered and shared among users via the

Internet. In the years to come, there will be a rapid convergence of computer, communications and consumer electronics. There will also be a need of professionals who possess knowledge in all three areas of computer networks, multimedia signal processing and electronics. The Programme primarily aims to produce graduates that will fulfil such a need by providing sufficient technical training to students for a career in the field of Internet and multimedia technologies. Moreover, the Programme aims to develop all-round students to adapt to the rapidly changing environment. All students will also acquire some form of work-integrated education before graduation.

Specifically, the Programme is designed to equip students with:

(i) the necessary practical skills in the application of Internet and multimedia technologies through hands-on experience and industrial placements;

(ii) an in-depth and up-to-date knowledge of Internet and multimedia technologies;

(iii) the skills to evolve into self-learners who have the necessary foundation to continue to update their expertise;

(iv) fundamental theory and practical skills adaptable to a workplace environment;

(v) analytical thinking, problem solving, interpersonal and communication skills;

(vi) the ability to develop as creative learners who can work with abstract ideas and implement them in a practical environment; and

(vii) the necessary knowledge and skills to enable them to function in a variety of professional roles.

Upon graduation, students should have acquired sufficient knowledge to commence their careers in the following areas:

(i) Digital entertainment industry – designing computer games, creating digital effects for movies, planning, installing, configuring and maintaining digital broadcasting equipment.

(ii) Internet-related business – developing applications with multimedia features on networks, particularly on the Internet.

(iii) Data network centres – planning, installing, configuring and maintaining general computer networks.

(iv) Mobile communications and computing – developing applications particularly for the current and future mobile systems that involve much multimedia

contents, such as mobile games, mobile video streaming systems, and mobile information systems.

(v) Electronic industry – developing embedded electronic products with multimedia features, such as electronic toys, electronic educational units, and personal entertainment units.

Throughout the P-LOAP, a number of percentages are presented. Where do the percentages come from and how will the Department validate them?

Observations on Implementation of Outcome-based Education

in

Department of Industrial and Systems Engineering

The Hong Kong Polytechnic University

Prepared by

Professor Ira Jacobson

May 2011

A review has been made on the OBE-related documentation of the ISE programmes[1], including

(a) Definitive Programme Document 2010-11 **(DPD)**;
(b) Learning Outcomes Assessment Plan **(LOAP)**;
(c) PLOAP Interim Report 2010-11 **(PLOAP);** and
(d) Annual Programme Review Report 2009-10 **(APRR)**.

My comments on the documents are as follows:

BSc(Hon) in Logistics Engineering and Management (FT-UGC)(Code: 02004)

(Document reference: PLOAP)

1. There is no indication in the improvement and issues and difficulties sections that the benchmarking has not been validated and needs to be. It lacks a rational process on how the initial percentage for measuring success (e.g 85%) is being determined. And it is crucial to benchmark the initial estimate with employer/alumni surveys. If the internal assessment shows that a specific programme outcome is successfully attained, while the opposite is concluded from external validation, it implies that either the initial estimate is too low or colleagues are too lenient in making the judgement.

(Document reference: DPD)

2. Page 2-3 table 2.5 – wouldn't programme aim 5 be related to all of the ILOs since it will allow the students to be exempted?

3. What are the criteria for exemption from dual language proficiency (Page 4-2)? The document should spell out clearly the exemption policy for non-native speaker in Chinese.

4. Since the subject ILOs are being offered to show that the programme outcomes are met, it would be useful in the subject descriptions to indicate where this is happening. The

[1] These include:
BEng (Hons) in Industrial and Systems Engineering (FT-UGC)(Code: 45085)
BSc (Hons) in Enterprise Engineering with Management (FT-UGC)(Code: 45092)
BSc(Hon) in Logistics Engineering and Management (FT-UGC)(Code: 02004)
BEng(Hons) in Product Engineering with Marketing (FT-SF)(Code: 45087)
BSc(Hons) in Industrial Quality Management(PT-SF) (Code: 45083)
BEng(Hons) in Product Engineering with Marketing (PT-SF)(Code: 45090)

accounting and finance descriptions have made this connection by adding a section on 'role and purposes'. It would be helpful for the teaching staff to know the relationship between the subject and the programme outcomes.

(Document reference: APRR)

5. Until results are obtained from employer surveys you don't know whether the outcomes are met or not, and whether the issue is that you have too low, too high or too lenient of a benchmark. (para. No. 6)

(Document reference: LOAP)

6. How was the 85% determined? [as discussed at Para. 1 above]

7. Are 1 to 7 on Page 6 a complete list of outcomes? How were they determined? I understand that this programme does not seek HKIE accreditation. Yet, the HKIE requirements are good reference for programmes in the generation of learning outcomes.

BSc(Hons) in Industrial Quality Management(PT-SF) (Code: 45083)

8. Same comments as 02004 above.

BEng (Hons) in Industrial and Systems Engineering (FT-UGC)(Code: 45085)

(Document reference: PLOAP)

9. No indication of how the benchmarks are being validated or any external verification of the %s used. [as discussed at Para. 1 above]

(Document reference: APRR)

10. Same comments as 02004 above.

(Document reference: DPD)

11. A misleading statement on para. 4.11 (Page 4-5) about the individual project. It says: 'It is of course, quite impossible to specify in advance the exact objectives which are to be met during the execution of the project...' The objectives of an individual project cannot be

determined on the fly because they should be the same no matter what projects students will do. Conceptually, objectives should be defined at a higher level than subject outcomes, while the syllabus is at the lowest level. So the above statement might better be revised to 'It is of course, quite impossible to specify in advance the exact projects which are to be undertaken by students.....'

12. In some subjects (e.g. ISE467), there are 5 subject ILOs but only 4 major parts in the syllabus. This is against the common understanding that subject outcomes are of a higher level than the syllabus. Moreover, having only 4 major parts of syllabus to fulfill 5 subject ILOs would pose a great challenge in attaining a constructive alignment between examination/test questions and subject ILOs.

13. In the subject descriptions, it would be useful to relate subject ILOs or parts of them to programme outcomes.

BSc (Hons) in Enterprise Engineering with Management (FT-UGC)(Code: 45092)
BEng(Hons) in Product Engineering with Marketing (FT-SF)(Code: 45087)
BEng(Hons) in Product Engineering with Marketing (PT-SF)(Code: 45090)

14. Same comments as above programmes.

Other observations

Constructive alignment of subject outcomes and assessment methods

15. Similar to some other departments, ISE has started to work on subject level outcome assessment, which, due to some inherent difficulties, would be a challenging task. It is not easy and not necessarily doable to work out a constructive alignment between subject outcomes and assessment unless the subject ILOs are independent variables. But the chance of having the latter is slim for engineering programmes because engineering is an integrated profession. The higher the subject level, the higher degree of integration it requires. Hence, a one-to-one relationship between an examination/test question and a subject ILO is hard to exist especially with advanced subjects. That's why colleagues find it so frustrating to align subject ILOs with examination questions in a quantitative way. Colleagues are recommended to do away with pure numerical models in assessing subject outcomes, but to adopt a rubric approach and apply their professional judgment on how well a student has fulfilled a specific programme outcome based upon his/her overall performance on the subject. After all, this is merely an internal assessment, the result of which has to be externally

validated by employer/alumni surveys as a feedback mechanism.

16. Subjects are just vehicles to fulfill the programme outcomes. They would be replaced gradually over time if they are found irrelevant to the programme outcomes.

Overall grade should not be used for assessing programme outcomes

17. Apart from the misleading grade descriptions (C Grade), the overall grade is never a measure of programme outcomes unless there is a one-to-one relationship between subject ILOs and examination/test questions.

Observations on Implementation of Outcome-based Education

in

Department of Mechanical Engineering

The Hong Kong Polytechnic University

Prepared by

Professor Ira Jacobson

May 2011

A review has been made on the OBE-related documentation of the ME programmes[1], including

(a) Definitive Programme Document 2010-11 **(DPD)**;
(b) Learning Outcomes Assessment Plan **(LOAP)**;
(c) PLOAP Interim Report 2010-11 **(PLOAP);** and
(d) Annual Programme Review Report 2009-10 **(APRR)**.

My comments on the documents are as follows:

BEng(Hons) in Mechanical Engineering (FT-UGC)(Code: 43078)

(Document reference: LOAP)

1. Why 90%? How about external evaluation of students?

   It lacks a rational process on how the initial percentage for measuring success (90%) is being determined. And it is crucial to benchmark the initial estimate with employer/alumni surveys. If the internal assessment shows that a specific programme outcome is successfully attained, while the opposite is concluded from external validation, it implies that either the initial estimate is too low or colleagues are too lenient in making the judgement.

(Document reference: DPD)

2. Para. 3.1 says *"The BEng(Hons) in Mechanical Engineering (BEME) programme offered by the ME Department is designed to produce preferred graduates that are broad-based and knowledgeable in the fundamentals of mechanical engineering."* External evaluators would find the use of 'preferred graduates' problematic as it gives no idea who the graduates are preferred to. More importantly, such a stipulation puts the programme in severe danger because it fails when one employer says a graduate elsewhere is preferred. Avoid using extreme language in OBE as it has to be measured and validated if it is achievable.

3. The subject description forms don't show how the subject fits in with the programme learning outcomes. Since the subject ILOs are being offered to show that the programme outcomes are met, it would be useful in the subject descriptions to indicate where this is happening.

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[1] These include:
BEng(Hons) in Mechanical Engineering (FT-UGC)(Code: 43078)
BEng(Hon) in Product Analysis and Engineering Design (PT-UGC) (Code: 43097)
BEng(Hons) in Mechanical Engineering(PT-self-financed)(Code: 43091)

Teaching staff and students would find it helpful to know the relationship between the subject and the programme outcomes.

4. Objectives are sometimes not broad enough in subject description forms and some are just restatement of the syllabus. For example, ME3107 has 5 objectives, 5 subject ILOs and 4 major parts in syllabus. This creates problems in the alignment of subject ILOs and examination/test questions. Conceptually, objectives should be defined at a higher level than subject outcomes, while the syllabus is at the lowest level. Instead of repeating the syllabus 3 times under different headings, a clear hierarchy amongst the three items has to be shown. It is recommended to raise the objectives to a higher level by making it less specific.

   (Document reference: APRR)

5. How do students from overseas universities deal with dual language requirements? The document should spell out clearly the exemption policy for non-native speakers in Chinese.

6. Grades are normally not a good indicator of achieving a programme outcome. Apart from the misleading grade descriptions (C Grade), the overall grade is never a measure of programme outcomes unless there is a one-to-one relationship between subject ILOs and examination/test questions. Instead, a rubrics approach is suggested (refer to para. 10 – 12).

   (Document reference: LOAP)

7. (Page 2) As explained in para. 6 above, grades are not a good indication in general. Parts of the testing may be good indications of programme outcome achievement but not an average grade.

8. (Page 5) It has been admitted that using examination performance may not be accurate in outcome assessment. This is a killer sentence because it tells the method being used is inaccurate.

BEng(Hon) in Product Analysis and Engineering Design (PT-UGC) (Code: 43097)
BEng(Hons) in Mechanical Engineering(PT-self-financed)(Code: 43091)

9. Same comments as above.

Other observations

Constructive alignment of subject outcomes and assessment methods

10. Subject level outcome assessment, which, due to some inherent difficulties, is a challenging task. It is not easy and not necessarily doable to work out a constructive alignment between subject outcomes and assessment unless the subject ILOs are independent variables. But the chance of having the latter is slim for engineering programmes because engineering is an integrated profession. The higher the subject level, the higher degree of integration it requires. Hence, a one-to-one relationship between an examination/test question and a subject ILO is unlikely to exist, especially with advanced subjects. That's why colleagues find it so frustrating to align subject ILOs with examination questions in a quantitative way.

11. Colleagues are recommended to do away with pure numerical model in assessing subject outcomes, but try to use a rubric approach and apply their professional judgment on how well a student has fulfilled a specific programme outcome based upon his/her overall performance on the subject. After all, this is merely an internal assessment, results of which have to be externally validated by employer/alumni surveys as a feedback mechanism.

12. Subjects are just vehicles to fulfill the programme outcomes. They would be replaced gradually over time if they are found irrelevant to the programme outcomes.

External surveys

13. External surveys are important tools to validate the initial estimate on the measure of success in outcome assessment. However, departments always feel disappointed with the response rate received. As a matter of fact, a response rate of 10 – 15% is not unusual. Even with intensive follow-up actions, 25% is a lucky result. So avoid having unrealistic expectation on external surveys.

14. Departments are encouraged to look for more productive ways to conduct the surveys. For example, sending personalized emails helps improve the response rate. As graduates have better acquaintance with their final project supervisors, they would be more willing to reply if the invitation email is sent from their supervisors. Besides, do not forget that alumni graduated 5 years ago can also be employers of your current batch of graduates as well.