



Ref. No.

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**Projects on Promoting Outcome-Based Approaches in Student Learning
2007-08
Application for OBA Funding**

PART I: General Information

1. Title

Alignment of the BSc(Hons) in Geomatics (Geo-IT) with HKIE and ABET criteria on outcomes-based programme accreditation

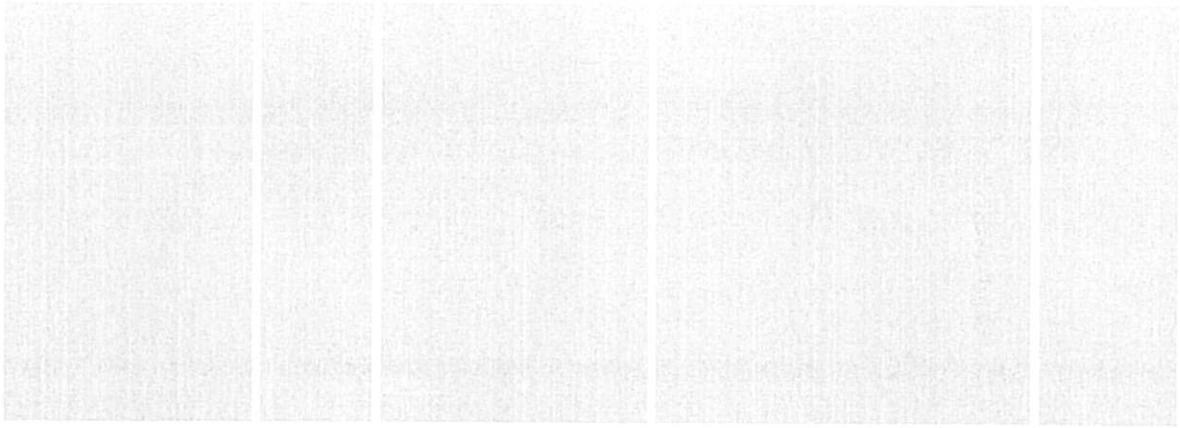
2. Name(s) of Applicant(s)

Project Leader

Name	Dept	Post	Groupwise	Ext.
Esmond Mok	LSGI	Professor and Associate Head	lsemok@inet.polyu.edu.hk	5953

Team Member(s)

Name	Dept	Post	Groupwise	Ext.
YQ Chen	LSGI	Chair Professor	lsyqchen@inet.polyu.edu.hk	5966
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Nelson Chan	LSGI	Instructor	lsnchan@inet.polyu.edu.hk	5973



3. Total funding requested

4. Expected duration of project: 25 months

Proposed commencement date: 1st May 2008

Expected completion date: 30th June 2010

PART II: DETAILS OF PROPOSAL

1. Project objectives and significance

(What are your objectives in initiating this project? How does it align with institutional goals and targets in implementing outcome-based approaches in student learning?)

The University's Mission on "Academic Excellence in a Professional Context" places emphasis on:

1. Programmes that are application-oriented and produce graduates who can apply theories in practice.
2. Research of an applied nature relevant to industrial, commercial and community needs.
3. Intellectual and comprehensive development of students within a care environment.
4. Dedicated partnerships with business, industry and the professions.
5. Enabling mature learners to pursue life-long learning.

With the spirit of missions (1) and (4), our BSc(Hons) in Surveying and Geo-informatics was restructured into two streams in 2005-06, the BSc(Hons) in Geomatics with specialisms in Land Surveying and in Geo-Information Technology. The BSc(Hons) in Geomatics (Geo-IT) stream was developed to meet the increasing demand for Geo-information specialists in non-surveying fields as a result of advances in computer technology and improvement of spatial data handling algorithms, and is currently under preparation for accreditation by the Information Engineering Discipline of the Hong Kong Institution of Engineers (HKIE). Outcomes-based accreditation criteria are currently under development by the HKIE (<http://www.hkie.org.hk/>), and this approach will be fully implemented in year 2012. Twelve abilities that graduating students should possess have been identified as important by HKIE and ABET (Accreditation Board of Engineering and Technology). Moreover, The UGC has set up a Quality Assurance Council (QAC) to assist in the development of QA responsibilities to higher education institutions. The UGC has announced a new round of learning quality audit for all first degree and above programmes that will focus on the OADRI (Objective, Approach, Deployment, Results, Improvement) mechanism, and evidence of the OADRI process. Therefore, it is necessary to develop a mechanism to measure how well a group of graduating students has developed in the

twelve HKIE outcomes, as well as to develop a feedback mechanism to continuously improve the curriculum design and student learning methods and assessments.

The Principal Investigator (PI) attended a one-day workshop on "Programme Outcome Education and Assessment" organized by HKIE on Jan 11, 2008. The workshop was conducted by the reputed Prof. Ira Jacobson who is the father of OBA education in engineering programmes. After going through the exercises using the BSc(Hons) in Geomatics (Geo-IT) programmes, the PI has gained new insights on how programme outcomes are assessed, and the relationship between subject and programme assessments. After thorough discussions with Prof. Jacobson, it was clear that students' performance of individual subjects would not sufficiently provide a full picture of their success in achieving programme outcomes which is emphasized on a threshold percentage (e.g. 80%) that students have acquired the specifying abilities at graduation. An independent assessment procedure with specific set of criteria to directly link the performance of subject and programme outcomes is therefore necessary.

The objectives of this project are:

1. To review the programme outcomes of the current BSc(Hons) in Geomatics (Geo-IT) with reference to the criteria set out by HKIE and ABET.
2. To identify the gaps between the subject and programme levels of assessment, and to eliminate/minimise the gaps by re-designing appropriate assessment methods of subjects that can effectively reflect students' performance in the defined programme outcomes.
3. To design effective methods to measure how well the graduating students have developed in the defined programme outcomes.
4. To evaluate the effectiveness of the programme assessment method.
5. To extrapolate the outcomes into the remainder of the BSc programme.

2. Target users

(Who are the intended users of the 'deliverables' of the project – faculties / departments management or programme/subject teams or students?)

The intended users of the deliverables are: subject lecturers, programme leaders, DLTC members. The deliverables will also be available for reference by FCLU and other engineering departments.

If the target users are students, complete the table below:

Programme/ subject code	Programme/subject title	Credit units	Mode of study	Student intake quota per year

Please insert rows in the table if more space is required for additional information.

3. Outcomes and deliverables

(a) Major outcomes and deliverables

(What will be the major outcomes and deliverables of the project?)

	Major outcomes and deliverables with descriptions
(a)	The programme document with the programme outcomes reviewed referenced to the criteria set by HKIE and ABET, and the subjects re-aligned to these specific programme outcomes
(b)	Effective methods for developing students' abilities they should have possessed at the time of graduation. The methods will be implemented in appropriate subjects and other training components of the programme.
(c)	Rubrics and/or other appropriate assessment methods that can provide useful information on students' programme outcomes development at different stages.
(d)	A programme assessment mechanism that can effectively measure how well the student group performs in the specified programme outcomes at graduation.
(e)	A mechanism to evaluate the developments in (b), (c) and (d) above and to provide feedbacks for improvements.

Please insert rows in the table if more space is required for additional information.

(b) Plan for developing and piloting / implementing the deliverables

(Detail the plan and procedures that you will adopt to develop and pilot/ implement the outcomes and deliverables. Also specify the dates of the pilot / implementation period)

Programme Review

1. The relationship of programme objectives (PJ) to university mission (UM), and the programme outcomes (PO) that support the educational objectives referenced to the criteria set by HKIE and ABET will be reviewed and analyzed. Adjustments will be made to the existing programme curriculum to ensure that UM, PJ and PO are properly related.
2. A summary of subjects with their outcomes identified to have contributions to specific programme outcomes will be created. The summary will include, for example, methods for developing the abilities, whether students will be taught and/or given opportunities to practice, and whether students' abilities will be measured. The development path of each specified programme outcomes will be clearly mapped out, and modifications will be made as necessary.

Design of Programme Outcomes Development Plan and Assessment

1. Students' abilities in programme outcomes are developed at different stages, and their achievements should progress at different stages of the development path, with the expected abilities demonstrated at the final stage. Since students' performance in the subject cannot fully reflect their development of the twelve HKIE abilities, methods for assessing how well students have developed in the specified programme outcomes at different stages will be designed. Views from students, alumni, industry and professional bodies will be sought on the assessment methods. Factors such as whether rubrics or other appropriate methods are to be adopted, what elements are to be measured, how often measurements will be carried out, and how many survey samples will be sufficient, will be considered.

2. Students' abilities should have been fully developed at the final stage of the education process. Final year projects (group and individual) will be used to measure how well students have developed at the time of graduation. Different projects may have different emphasis of learning outcomes. A student or a group of students doing project "A" may better reflect the abilities of one set of programme outcomes, while another student or another group of students doing project "B" may better reflect other areas of programme outcomes. At this stage of investigation, appropriate assessment rubrics will be designed based on the investigation areas of the project and with involvement of students. It is believed that this mechanism will enable students to 'own' the assessment tasks so that these criteria and standards will become their learning goals. It should be emphasized that, assessment result of a single project will only be able to reflect students' abilities in certain outcomes which individually may not be very meaningful. However, the collection of students' performance in different projects, and with the results suitably evaluated by stakeholders, the assessment results will become meaningful and reliable, which can be used as a feedback loop to improve the programme outcomes development process.

The following is the proposed work schedule:

Project Activities	Period
Programme Review	May – July 2008
Analysis of programme review results	August – September 2008
Re-align subject and programme outcomes	October – November 2008
Design of rubrics for assessing students' development of programme outcomes at developmental and reinforcement stages	December 2008 – April 2009
Design of rubrics for assessing how well students have developed in programme outcomes at graduation	December 2008 – April 2009
Implementation and evaluation of programme assessment methods	September 2009 – June 2010
Improvement of programme assessment design according to evaluation results	December 2009 (after 1 st semester) – June 2010

Planned pilot / implementation period of the deliverables:

Start Date (dd/mm/yyyy): 01/05/2008

End Date (dd/mm/yyyy): 30/06/2010

4. Dissemination and sharing plan

(How are you going to disseminate and share the outcomes and deliverables of your project?)

Where to disseminate/share outcomes/deliverables of project?	How to disseminate/share outcomes/deliverables of project?
Within departments of FCLU	<ul style="list-style-type: none"> – Work hand-in-hand with colleagues involved and introduce the mechanism to colleagues who are potential users – Disseminate information regarding the mechanism during departmental retreats, staff meetings, and staff and student liaison committees etc. – Share experience in Faculty teaching and learning seminars
Other departments	<ul style="list-style-type: none"> – Share in seminars/workshops organized by other departments
Other universities, local and overseas	<ul style="list-style-type: none"> – Submit papers to relevant Journals

5. Evaluation plan

(How do you plan to evaluate the effectiveness of the project, particularly its impact on the implementation of outcome-based approaches in student learning in the PolyU?)

Students' abilities in the specified programme outcomes will be measured using final year student projects. A collection of students' assessment results will indicate the degree of abilities that the group of final year students has developed. However, the validity of the assessment results cannot be accurately verified without stakeholders' feedback. It is therefore proposed that questionnaire surveys will be conducted. The surveys will cover key stakeholders, including students, alumni, professional bodies and employers. Depending on the level of maturity of OBA development of the academic programme, questionnaire survey may need to be conducted more frequently at the beginning, and may only need to be carried out at a suitable period of the review cycle. The survey results and students' assessment results will be analyzed. Particular attention will be paid to those components having contradictory results. The analysis results will be used to improve the whole programme outcomes assessment system.

6. Impact

(How will the project contribute to the success of the implementation of outcome-based approaches in student learning in the PolyU/ department/ programme/ subject?)

This project will involve all LSGI's frontline teachers of the BSc(Hons) in Geomatics (Geo-IT) programme, students and stakeholders. The discussions and design in the process of conducting this project will significantly increase the participants' awareness of outcomes-based approaches to student learning, and help the development of outcomes-based teaching and learning culture in LSGI. The experience gained and the deliverables developed in this project will be a good example of the development of outcomes-based engineering programmes. Furthermore, this project is a good example to illustrate the OADR mechanism emphasized by the Quality Assurance Council.

7. Target date(s) for submission of progress and completion reports

	Planned submission date (mm/yyyy)
1. Progress report <i>(for projects whose duration lasts more than 1 year; to be submitted mid-way through the proposed project period)</i>	05/2009
2. Completion report <i>(to be submitted within 3 months after the project completion date)</i>	09/2010

PART III: BUDGET OF PROPOSAL

*Important Notes

1. Funding requests for equipment and/ or software will be considered only if:
 - a. the equipment / software is essential to the successful implementation of the project, AND
 - b. it is not available in the department concerned. The Project Leader has the responsibility to check this out.
2. The purchasing policies and procedures of FO must be followed for the procurement of approved items.
3. Funding request for conference attendance will not be considered.

Project Leader

Name: Prof. Esmond Mok Signature: 

(in block letters)

LSGI

30th January, 2008


Dept: Date:

PART IV: DEPARTMENTAL ENDORSEMENT

Endorsement by Chair of FLTC/ DLTC:

Comments on the proposal:

The proposal was discussed in DLTC meeting and was strongly supported by DLTC members.

Name: Prof. Esmond Mok
Signature:  Date: 30th January, 2008
(in block letters)

Endorsement by Dean/ HoD:

Comments on the proposal:

strongly supported

By endorsing this proposal, I agree that:

1. The proposal suitably addresses the School/Department's needs in promoting and implementing outcome-based approaches in student learning and will be considered as part of the School's/Department's Business Plan.
2. The School/Department will receive a funding as calculated for item (e) in the Budget section which I will use for providing the time release recommended by the project proposers, based on the Total Workload Model, to support them to work effectively on the project.

Name: Prof. Y.Q. Chen
Signature:  Date: 30th January, 2008
(in block letters)

Please return this form to Miss Miranda Fung, Secretary of Working Group on Outcome-based Education,
c/o Educational Development Centre
by 31 January 2008

OBA Project Proposals – Request for supplement

Proposed Project: Alignment of the BSc(Hons) in Geomatics (Geo-IT) with HKIE and ABET criteria on outcome-based programme accreditation

Justify the funding requested for the proposed activities which are supposed to be done by all programmes for OBE Implementation

1. This proposal was prepared according to theme C “Reviewing the alignment and mapping of subjects to programme outcomes” of the Call for the OBA Funding Proposals 2007-08, in which section it states that possible projects may include reviewing and improving the effectiveness of the alignment and mapping of the subjects to the programme outcomes.
2. Other purposes of proposing this project are to increase the synergy amongst the department’s teaching staff; and, most importantly, to promote a joint effort in identifying and devising teaching and assessment methods to effectively help students achieve the intended learning outcomes of all LSGI programmes. Fourteen frontline teachers from Head of Department to Instructor levels will participate in this project.
3. One of the major investigations to be carried out in this project is the design of effective method(s) to measure how well students’ generic and professional competences have been developed at different study stages. Curriculum review to ensure effective mapping and alignment of subjects to programme outcomes is essential before measurement of students’ ability development is designed.

Explain and specify how project outcomes and deliverables may make a difference to the current practice

The current curriculum was developed prior to the Hong Kong Institute of Engineers (HKIE) becoming a stakeholder in our programmes; thus the twelve competencies that HKIE expects to see in our graduating students need to be integrated with the OBE requirements from PolyU prior to accreditation and full implementation in year 2012. The proposal on subject and programme assessment mechanism is designed in light of Prof. Ira Jacobson, who is the father of OBA education in engineering programmes. The assessment mechanism will be supported and recognized by the professional body and the industry professions. Moreover, students’ professional and generic competencies will

be better developed under the new system and their employment prospects significantly widened.