

# Quality Enhancement Grant Scheme

**Final Evaluation Report**

Project No. : 32/QEGS/B-08-09

## Part A

Project Title : An Outcome-based Approach to Curriculum Development in AD Programmes

Name of Grantee : Hong Kong Community College

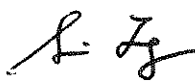
Project Period : From September 2009 (month/year) to August 2012 (month/year)

## Part B

Please use separate A4-size sheets to provide an evaluation of the Project with regard to the following aspects:

1. Project activities contributing to the attainment of Project objectives, extent of attainment of the objectives, evidence or indicators attesting to the attainment of the objectives, and if applicable, reasons for not able to achieve the objectives.
2. Impact or benefits of the Project to the participants, the target institution(s) or the sector.
3. Cost-effectiveness of the Project against clear indicators, e.g. utilization of available resources, unit cost per beneficiaries, sustainability of Project activities/impacts, applicability of Project outcomes/deliverables to other institutions, or alternative approaches for equivalent benefits at less cost, etc.
4. Outcomes and deliverables of the Project.

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Name of Authorized Person: Dr. Simon Leung

Name of Grantee

Organization: PolyU HKCC

Position of Authorized

Person: Director

Date: 28 January 2013

**A Final Evaluation Report on QEGS Project –**  
**An Outcome-based Approach to Curriculum Development in Associate Degree Programmes**  
**Project Code: 32/QEGS/B-08-09**

**1. Attainment of Project Objectives**

There were three major objectives of the project: (a) To demonstrate the quality of our graduates to key stakeholders; (b) To make evident public accountability; and (c) To improve student learning via systematic curriculum development.

**(a) To demonstrate the quality of our graduates to key stakeholders**

In the project, the programme intended learning outcomes (PILOs) of the three pilot programmes, namely, Associate in Engineering, Associate in Business (Marketing), and Associate in Applied Social Sciences (Sociology and Culture), were first written and then developed into the Programme Learning Outcomes Assessment Plan (P-LOAP). The plan was used to schedule time and select evidence for reflecting the performance in each pilot programme. A questionnaire<sup>1</sup> and a focus group protocol for indirect measurement of generic and programme learning outcomes were developed. The questionnaire consisted of three sections: student engagement questionnaire, self-competence, and programme-specific questions; and the graduates' focus group interview served as evidence on students' generic competence, their perceptions of learning and teaching environments, their self-esteem, and self-reported attainment of generic and programme learning outcomes. In addition to the indirect measurement, course-embedded assessment was used as direct measurement of students' attainment of programme learning outcomes. Finally, an expert system called Fuzzy Inference System was developed to infer the levels achieved by students for programme learning outcomes. The system provided an alternative evidence to demonstrate the appropriateness of the PILOs and the performance of students.

Two waves of data collection and analysis were completed and the last round results are attached in Appendices I-III. After this final round of data collection and analysis, a cycle of P-LOAP for 2-year Associate Degree programmes was completed. The results (submitted in past reports and this report) supported that our programmes underwent positive changes and added value to students' academic development as well as their generic competences, including critical thinking, self-managed learning, problem-solving skills, communication skills, active learning, computer literacy, etc. Furthermore, the results indicated that students attained most of the PILOs, suggesting that the existing curriculum of the three selected programmes was effective in developing and

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<sup>1</sup> Derived from existing literature: Kember & Leung (2009) Development of a questionnaire for assessing students' perceptions of the teaching and learning environment and its use in quality assurance. *Learning Environment Research*, 12, 15-29. and Tafarodi & Swann (1999) Two-dimensional self-esteem: theory and measurement. *Personality and Individual Differences*, 31, 653-673.

preparing students for further studies. For those unattained PILOs suggested by evidence, the programme teams took appropriate action to refine and improve the existing curriculum (please refer to item (c) below).

Despite areas for improvement, our current attempt to implement a full cycle of programme evaluation provides a valid and reliable means for our College to demonstrate the quality of our graduates to stakeholders. In this light, we regard ourselves successful in attaining this objective. Extent of attainment of this objective: 100%.

(b) To make evident public accountability

The evidence was collected through course-embedded assessment, questionnaires and graduates' focus group interviews. Results indicated that students' generic competences in many areas, such as, critical thinking, problem-solving skills, self-managed learning, interpersonal skills and group work, etc, were improved upon graduation. Also, P-LOAP was employed to evaluate the overall effectiveness of the three pilot programmes. The performance of individual students in attaining PILOs was inferred by the Fuzzy Inference System. Examples of the system output are shown in Appendix IV. For students, the information allows them to understand their strengths and weaknesses so as to work hard on their weak areas. For teachers, the information provides an opportunity to redesign learning and teaching methods/assessment in subjects that can be better aligned with PILOs. For programme teams, the information reflects which PILO(s) need(s) to pay more attention. Through this systematic and vigorous collection and analysis of evidence, it can show to the public that associate degree programmes are effective and their graduates are of quality.

We organised a one-day symposium on 8 June 2012 to publish our findings and experience on completing a cycle of P-LOAP. Participants had the chance to exchange views on education, P-LOAP implementation at PolyU and the progress of this QEGS project. Apart from the above, partial results were published in two international conference proceedings. A book chapter titled "Development of generic capabilities in teaching and learning environment at associate degree level" was accepted for publication. In the future, we will consider publicising the project's results on our HKCC website as a way to demonstrate our quality programmes and graduates.

Extent of attainment of this objective: 100%.

(c) To improve student learning via systematic curriculum development

The ultimate goal of OBA is to improve student learning through evidence-based programme review. Our students may have benefited indirectly by the following means. First, our three selected programmes have prepared reflection and recommendation reports to identify good practices and areas for improvement under the following aspects (Appendix V): (i) content of a subject; (ii)

teaching and learning methods used; (iii) assessment methods used; (iv) subjects/programme learning outcomes; (v) curriculum design, e.g. addition or replacement of subjects, discipline-specific compulsory/elective subjects, etc; (vi) design teaching and learning activities and assessment methods that are aligned with PILOs. Not only students who have enrolled on these three programmes will benefit, students from other programmes will also become potential beneficiaries, since our three programme teams have disseminated their experience and findings to other programme teams in scheme meetings and workshops organised by the Learning and Teaching Quality Committee of HKCC. It is expected that other programme teams will adopt an Outcome-based Approach to programme evaluation to seek improvement in their programmes.

The project has also helped improve our curriculum in another way. For instance, recommendations from our consultant, Prof. Mary Allen, were taken on board for the preparation of the validation exercise already, where there was a substantial change in the ration of GE and Discipline-Specific subjects. One recommendation we adopted was in relation to the flexibility of counting credits of GE subjects to create sufficient curriculum space for Discipline-Specific knowledge training. Another recommendation we accepted was in relation to the development of articulation agreements with 4-year degree programmes in order to provide a seamless articulation for HKCC students by aligning our programme outcomes and curriculum structure carefully. The project has allowed the College to bring in international perspectives on curriculum design in such a way to provide sufficient curriculum space for Discipline-Specific knowledge training as well as flexibility for students in attaining both generic and professional outcomes.

Extent of attainment of this objective: 100%.

## **2. Impact or Benefits of the Project**

As mentioned in (1) above, we have developed different instruments for collecting evidence to demonstrate students' performance in attaining PILOs and developing generic competences, and the effectiveness of a programme. This can broaden teachers' horizons in adopting/thinking different assessment strategies to assess PILOs. Also, results provide a way for teachers' to reflect on their teaching. If encouraging results are obtained, it means that the alignment between PILOs and subject ILOs exist, and the learning and teaching methods and assessment methods are well designed. It will increase teachers' sense of achievement. Otherwise, it will provide a learning opportunity for teachers to try new things (e.g. learning and teaching methods, assessment methods, etc) in their teaching. Through this project, several seminars, workshops and consultation sessions were organised to help teachers develop or enhance their understanding in outcome-based education and how it could be implemented in their subjects. The OBE symposium allowed us to share the project's findings and experience with local self-financed sub-degree providers and OBE practitioners, which in turn facilitated the exchange of OBE experience among the sector.

### 3. Cost-effectiveness of the Project

Budget Items	Approved Budget	Actual Expense	Balance
Manpower	\$809,592	\$794,724	\$14,868
Equipment/Facilities	\$94,200	\$58,347	\$35,853
Services: Consultancy Fee	\$384,508	\$384,508	\$0
Others	\$48,700	\$42,634	\$6,066
Total	\$1,337,000	\$1,280,213	\$56,787

The unit cost for direct beneficiaries in the first consultancy visit (from 3 May 2011 to 7 May 2011): \$499/beneficiary.

The unit cost for direct beneficiaries in the second consultancy visit and Symposium (from 7 June 2012 to 8 June 2012): \$1,053/beneficiary.

In fact, all the materials developed from the project can be adapted for use for future rounds of programme evaluation and data analysis. These adaptations or minor adjustments may include the programme-specific questions in the questionnaires, protocols of graduates' focus group interviews and the P-LOAP itself when applying to different programmes in the College. More substantial modifications are needed when PILOs and programme curriculum have been updated.

These materials developed can be disseminated for other institution' adoption. As such adoption will involve modifications, a guidebook/resource book has also been published to offer simple step-by-step suggestions, explanations and practical tips on how to carry out a programme evaluation cycle with reference to the Outcome-based Approach.

### 4. Outcomes and Deliverables of the Project

#### (a) For the College

The table below lists some selected activities that had been organised to share the project's findings and experience in different stages of the project with our colleagues. Through these activities, we could update our colleagues on the OBE development, promote OBE, and improve the OBE implementation in the College. For the entire list of activities, please refer to Table 1 on page 8.

Date	Activities	No. of participants
7 Dec 2009	Sharing Session: Developing Learning Outcome Assessment Plan (LOAP): Our Own Experience at HKCC	134
4 May 2010	OBE Seminar: What do our graduates say about our	142

	programmes?	
4 May 2011	Consultancy Visit: Hands-on Workshop on Subject-Level Assessment Rubrics	159
5 May 2011	Consultancy Visit: Workshop on Programme Assessment for Academic Leaders	62
6 May 2011	Consultancy Visit: Workshop on Assessing GE Subjects	20
7 Jun 2012	Consultancy Visit: Reflective Workshop on Outcomes-based Teaching & Learning	40
8 Jun 2012	Symposium on An Outcome-based Approach to Sub-degree Curriculum Development	173
11 Jul 2012	Seminar on A Fuzzy Inference System for Inferring Level of Students' Achievement on PILOs	27

An expert system based on fuzzy logic (a computer program) was developed for inferring the levels achieved by students for programme-specific learning outcomes for the three pilot programmes of the project. The system input is the grades of compulsory subjects that used to measure PILOs, and the output is individual students' performance on PILO attainment (Appendix IV). The information allows students to understand their strengths and weaknesses, and work hard on their weak areas. For programme teams, the information reflects which PILO(s) need(s) to pay more attention. The system provides an alternative evidence to demonstrate the appropriateness of the PILOs and the performance of students. Hence, it is worth disseminating this system to OBE practitioners (a seminar was conducted on 11 July 2012 to our colleagues, especially to programme leaders).

(b) For the sector of sub-degree providers

Three questionnaires for collecting students' feedback from the three pilot programmes were modified and validated in the project (submitted in past reports). The questionnaires consisted of three sections: (i) Student Engagement; (ii) Self-Competence Scale-Revised Version; and (iii) Programme-specific Questions. The first two sections, (i) and (ii), were common to the three programmes. This self-reported measurement aimed at tracking students' changes before and after studying our programmes as well as identifying the intrinsic differences between students in different programmes. It served as one of the instruments used in indirect measurement for evidence collection in measuring students' attainment of PILOs. Also, students' perceptions on learning and teaching environments were obtained, which let us know which areas needed improvements in order to ensure the quality of a programme (quality assurance). Partial results based on these questionnaires were published in two conference papers as listed in part (c) below. As such, the questionnaires are worth sharing with the sector of sub-degree providers for institutions alike to adopt.

A one-day symposium titled “Symposium on An Outcome-based Approach to Sub-degree Curriculum Development” was held on 8 June 2012 from 9:30 – 16:00 at Hung Hom Bay Campus, HKCC. This Symposium aimed at sharing the experience, findings and skills gathered in this project. It was also a valuable platform for educators to learn from authorities and seasoned practitioners of OBE. There were three keynote sessions (speakers: Prof. John Biggs, Dr. Catherine Tang, and Dr. Angela Ho) which provided insights on a range of key issues related to OBE, including the integration of constructive alignment, programme learning outcomes assessment, common descriptors of qualitative framework, implementation issues including programme assessment and development, staff development, etc. Then two parallel discussion sessions were held to share the unique experience of a self-financing sub-degree provider in grappling with both macro and micro issues in the process of adopting OBE. The symposium attracted an audience of 173 people from various local institutions, e.g. HKU Space, Caritas, HKCT, VTC, OUHK LiPLACE, etc. Materials of the Symposium, such as the poster, rundown, and notes of presentation are shown in Appendix VI. The website of the symposium (<http://staffweb.cpce-polyu.edu.hk/obesymposium/>) is attached for your reference.

Based on the project experience in (i) the development and implementation of the P-LOAP; (ii) designing various instruments for evidence collection (both direct and indirect measurement); (iii) scheduling evidence collection; and (vi) reflection from evidence, a guidebook/resource book on an outcome-based approach to curriculum development at sub-degree level was written (Appendix VII). The guidebook/resource book aims at offering simple explanations of and practical tips on the steps needed to be taken to complete a full cycle of P-LOAP exercise so as to improve programme quality. We also hope that through this exercise, we can demonstrate graduates’ quality to our stakeholders, including articulation partners and employers, whom we hold accountable.

(c) Possible scholarly output

- (i) Assessing students’ development of program outcomes in an associate degree engineering curriculum: a longitudinal observation. IEEE International Conference on Teaching, Assessment and Learning for Engineering 2012, 20-23 Aug 2012, The Hong Kong Polytechnic University, Hong Kong. (Appendix VIII)
- (ii) Using Student Engagement Questionnaire (SEQ) to assess students’ perception of programme learning environment for quality assurance purpose: an exploratory effort in a community college in Hong Kong. International Technology, Education and Development Conference 2010. (Appendix IX)
- (iii) Development of generic capabilities in teaching and learning environment at associate

degree level (Book Chapter edited by Myint Swe Khine, she is a renowned scholar in the field of learning environment)

(iv) Under preparation. Disciplinary differences on learning outcomes.

**5. Activity List**

Detailed information on activities conducted during the project period is listed in Table 1 on page 8.

**6. Difficulties Encountered and Solutions Adopted**

When the project was completed, the Finance Office (FO) of PolyU started to prepare the final income and outcome statement. However, due to different perspectives in grouping of project expenditures between the project team and FO's accountants, we had to seek the budget reallocation approval from the EDB after the completion of the project.



Table 1. Activity List for Section 5

Types of activities	Date	Venue	No. of participants	Brief description
Delphi survey (Round 1)	Sep 2009	N/A	4 – 6 HKCC colleagues	Selected colleagues are the subject leader of the compulsory subject in each pilot programme (Marketing, Engineering, Sociology and Culture) for the development of Fuzzy Inference System
Data Collection	Dec 2009 – Feb 2010	N/A	17 graduates (Cohort 2007)	Collect evidence from the three pilot programmes by graduates' focus group interviews (Indirect measurement data collection)
Data Collection	Jan 2010	N/A	386 students (Cohort 2009)	Collect evidence from the three pilot programmes by questionnaires (Indirect measurement data collection)
Data Collection	May 2010	N/A	268 students (Cohorts 2008 and 2009)	Collect evidence from the three pilot programmes by questionnaires (Indirect measurement data collection)
Delphi survey (Round 2)	Jun 2010	N/A	4 – 6 HKCC colleagues	Previous participating colleagues for the development of Fuzzy Inference System
Data Collection	Sep 2010	N/A	649 students (Cohort 2010)	Collect evidence from the three pilot programmes by questionnaires (Indirect measurement data collection)
Data Collection	Oct 2010 – Dec 2010	N/A	31 graduates (Cohort 2008)	Collect evidence from the three pilot programmes by graduates' focus group interviews
Data Collection	Jan 2011 – Feb 2011	N/A	742 students (Cohorts 2009 and 2010)	Collect evidence from the three pilot programmes by course-embedded assessment. A total of 2,582 units of students' grades/marks were collected. (Direct measurement data collection)
Data Collection	Apr 2011 – May 2011	N/A	329 students (Cohorts 2009 and 2010)	Collect evidence from the three pilot programmes by questionnaires (Indirect measurement data collection)
Data Collection	Sep 2011 – Oct 2011	N/A	29 graduates (Cohort 2009)	Collect evidence from the three pilot programmes by graduates' focus group interviews

				(Indirect measurement data collection)
Delphi survey (Round 3)	Sep 2011	N/A	4 – 6 HKCC colleagues	Previous participating colleagues for the development of Fuzzy Inference System
Delphi survey (Round 4)	Jan 2012	N/A	4 – 6 HKCC colleagues	Previous participating colleagues for the validating the results in round 3 and fine-tuning the developed Fuzzy Inference System
Data Collection	Apr 2012	N/A	384 students (Cohort 2010)	Collect evidence from the three pilot programmes by questionnaires (Indirect measurement data collection)
Data Collection	Jun – Jul 2012	N/A	512 students (Cohort 2010)	Collect evidence from the three pilot programmes by course-embedded assessment. A total of 1,354 units of students' grades/marks were collected. (Direct measurement data collection)
Seminar	7 Dec 2009	HHB-UG05	134 HKCC colleagues	Sharing Session: Developing Learning Outcome Assessment Plan (LOAP): Our Own Experience at HKCC  In this session, we shared the experience of developing the P-LOAPs which were used in the project.
Seminar	4 May 2010	HHB-UG06	142 HKCC colleagues	OBE Seminar: What do our graduates say about our programmes?  In this session, we shared our findings on the graduates' focus group interviews based on the phase 1 qualitative report.
Workshop (Consultancy Visit)	4 May 2011	WK-N203	159 HKCC colleagues	Hands-on Workshop on Subject-Level Assessment Rubrics  In this workshop, Prof. Allen shared her expertise on designing subject-level rubrics for assessment purposes.
Workshop (Consultancy Visit)	5 May 2011	HHB-UG05	62 HKCC colleagues	Workshop on Programme Assessment for Academic Leaders  In this workshop, Prof. Allen shared with Programme Leaders issues relating to programme-level assessment.
Workshop (Consultancy Visit)	6 May 2011	HHB-UG05	20 HKCC colleagues	Workshop on Assessing GE Subjects  In this workshop, Prof. Allen shared her expertise on designing aligned learning and teaching

				methods to attain generic competences and understand the role of GE subjects in the curriculum.
Workshop (Consultancy Visit)	7 Jun 2012	HHB-507	40 HKCC colleagues	<p>Reflective Workshop on Outcomes-based Teaching &amp; Learning</p> <p>In this workshop, Prof. Biggs and Dr. Tang focused on the theory and practice of Outcomes-based Teaching and Learning, and reflected on the alignment between Programme Intended Learning Outcomes (PILOs) and Subject Intended Learning Outcomes (SILOs).</p>
Symposium	8 Jun 2012	HHB-UG06	173 local sub-degree providers and OBE practitioners	<p>A one-day symposium on An Outcome-based Approach to Sub-degree Curriculum Development</p> <p>The symposium aimed to share the project findings and experience with all self-financed sub-degree providers and OBE practitioners locally.</p>
Seminar	11 Jul 2012	HHB-UG03	27 HKCC colleagues	<p>Seminar on A Fuzzy Inference System for Inferring Level of Students' Achievement on P-ILOS</p> <p>A fuzzy logic-based computer programme was developed to computerize and model the results from the four Delphi surveys conducted in the QEGS project. This Fuzzy Inference System analysed students' achievements on PILOs by using students' subject grades. During the seminar, background information on the development and implementation of the System was presented.</p>