

A Conceptual Framework of Evidence Collection for Outcomes Assessment: A Case Study in Hong Kong

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Abstract

As one of four main streams in quality assurance, outcomes assessment has become markedly significant in higher education sector worldwide. Effective outcomes assessment rests with a robust system in collecting evidence of student achievements of learning outcomes at different levels. This paper attempts to develop a conceptual framework entitled Evidence Collection Initiative for Outcomes Assessment (ECI Framework) in the context of Hong Kong's higher education sector. The ECI Framework aims to provide an aggregate set of evidence for outcomes assessment.

Using the concept of constructive alignment adopted for the Outcomes-based Teaching and Learning (OBTL) approach, the ECI Framework integrates the course, programme and institutional levels together to constitute an overall evidence collection layout. The course-level represents the mainstay using Course-Embedded Assessment (CEA) as the primary instrument; this is complemented with academic tests administered at university-level for overall monitoring. At the programme level, course assignments are aggregated (Aggregated CEA) together to ascertain the attainment of programmes intended learning outcomes. Apart from direct evidence as mentioned, instruments for collecting indirect evidence are also adopted at each level. Initial implementation provided some useful empirical results supporting the framework's effectiveness in collecting and aggregating multiple forms of evidence for holistic assessment.

Keywords: Evidence collection, Outcomes assessment, Conceptual framework.

1. INTRODUCTION

As one of four main streams in quality assurance (Bogue, 1998, p. 9), outcomes assessment has become markedly significant in today's higher education sector worldwide. This not only represents a natural consequence from the prevalent adoption of Outcomes-Based Education (OBE), but also arises from the mounting pressure on universities' accountability (Liu, Bridgeman, & Adler, 2012, p. 352) for their educational quality and effectiveness (Baker, 2004, p. 2). Hence outcomes assessment has become an essential part of an outcomes-based teaching, learning and assessment environment. Outcomes assessment represents a major determinant of student learning behaviours and source of evidence for students and institutions about the achievement of learning outcomes, and it is a valuable vehicle for continuously enhancing the curriculum through identifying the gaps between intended and actual learning (Mok, Hung, & Wong, 2009).

Outcomes assessment aims to gather multiple forms of evidence for determining as to whether students have achieved the intended learning outcomes on a regular and systematic basis (Baker, 2004; Bogue, 1998, p. 11; Herson, 2006, 2004; Judd & Keith, 2012; Suskie, 2004, 2009). This means that effective outcomes assessment rests with a robust system to plan and implement the evidence collection exercises soundly. Although various type of assessment methods (e.g. course-embedded assessment, standardised tests, learning surveys) and approaches (direct versus indirect) have been widely discussed among different sources of literature (Judd & Keith, 2012), a conceptual framework to outline the major elements and their relationships, that can be practically adopted for gathering evidence about student achievements, is still not readily available. This is probably due to the fact that although outcomes assessment is not a new concept to higher education (Bresciani & Wolff, 2006, p. 7), it is not until the recent decades that this practice has been emphasised in both internal and external quality assurance.

This outcomes assessment has been transformed into a more systematic process, so as to effectively address the rising public demand for accountability (Baker, 2004; Duque & Weeks, 2010; Peterson & Einarson, 2001; Terenzini, 1989). As an attempt to address this conceptual and practical gap, this paper aims to present a conceptual framework entitled the Evidence Collection Initiative for Outcomes Assessment (ECI Framework) in higher education.

2. AN EXPLICIT GAP IN EXISTING LITERATURE AND PRACTICES

Review of early (Allen, 2004; Hernon, 2006; Maki, 2004; Suskie, 2004) and current literature (Judd & Keith, 2012) indicates that there are two broad approaches to evidence collection of student achievements in learning outcomes – direct versus indirect. Direct evidence is ‘based on the actual performance of students’ (Judd & Keith, 2012, p. 38) which are ‘tangible, visible, self-explanatory’ data of ‘what students have and haven’t learned (Suskie, 2004, p. 95), its instruments cover course-embedded assessment (essays, projects, examinations in individual courses), capstone experience or projects, portfolios and standardised tests, with each possessing its own strength and limitations (Allen, 2004; Hernon, 2006, 2004).

Indirect evidence provides the indication of learning based on stakeholders’ (students, alumni and employers) perceptions or experiences of how well the learning outcomes have been achieved. It can predict, mediate or report learning, instead of demonstrating or reflecting learning (Allen, 2004; Hernon, 2006; Judd & Keith, 2012). It is found that students’ perceptions of their learning environment have a greater impact on student learning outcomes than prior knowledge. Students perceiving themselves being in a superior learning environment perform better than those with negative perceptions (Duque & Weeks, 2010; Lizzio, Wilson, & Simons, 2002); these findings highlight the importance of using indirect evidence in helping judge the achievement of learning outcomes. Qualitative interviews and quantitative surveys are the common instruments in acquiring indirect evidence. Clearly, direct evidence is more valid, trustworthy and authentic as it entails students’ actual performance, but it is usually more costly to collect. However, in addition to being more efficient to gather, indirect evidence also enables institutions to explore in-depth how learning takes place amongst students and why some learning outcomes can be achieved by students effectively but others not (Allen, 2004). The existing body of literature has provided a detailed account of various instruments in collecting direct and indirect evidence respectively. However, a practically-viable conceptual framework to integrate various instruments together for collecting university-wide evidence does not seem to be readily available. This paper attempts to fill this gap.

3. STUDY METHODOLOGY

In this paper, Action Research was adopted as an overall methodology in piloting, monitoring and evaluating this conceptual framework. With a fundamental aim to improve practices (Elliot, 1991, p. 49), action research is a form of enquiry that enables practitioners to investigate and evaluate their work through the collaboration of all participants, so as to formulate effective strategies and solutions and bring about sustained changes (Marshall & Rossman, 2006, p. 6; McNiff & Whitehead, 2006, p. 7). This kind of enquiry has been widely practised in educational context, such as lesson planning, classroom instructions, formulating teaching and assessment strategies (Stringer, 2008).

Befitting the nature of this study, Action Research provides a research framework of ‘collective self-reflective enquiries’. These enquiries were undertaken to improve the evidence collection exercises for outcomes assessment (Berg, 2009, p. 247), through a spiral process of plan-act-observe-reflect (Kemmis & McTaggart, 1998) and by using a series of qualitative (observations, interviews) and quantitative instruments (surveys) (Efron & Ravid, 2013).

4. THE STUDY CONTEXT

The context of Hong Kong’s higher education sector in general and Hong Kong Baptist University

(HKBU) in particular drive the development of this conceptual framework.

4.1. Overview of the Higher Education Sector in Hong Kong

Being a world's cosmopolitan as well as one of the most advanced and globally connected cities in China, the Hong Kong Special Administrative Region (HKSAR) experiences its share of the global situation in the education scene. With an aim to develop itself into a regional education hub, Hong Kong embraces the worldwide movement of adopting OBE and outcomes assessment. The University Grants Committee (UGC), the independent funding agency for higher education established by the Government of HKSAR, stipulates that the outcomes-based approach to student learning must go hand-in-hand with curriculum review in the tertiary sector. Therefore Hong Kong's higher education sector is regarded as an interesting context for inquiry, reflected by its changing landscape, growing international recognition and blend of Asian and Western cultures in affecting teaching and learning (Ho, 2005).

As planned by the Government of HKSAR, participation rate in post-secondary education had been raised from 33% to 60% (University Grants Committee (UGC), 2010) between 2000 and 2010. In 2007, the UGC started to conduct quality audits for the 8 public universities under its funding purview. The primary aim of these audits is to assure and enhance the quality of student learning. Preparation is now underway for an upcoming round of audits due to commence in 2015, focusing on the learning experience of students and outcomes assessment, which hinge on the provision of sound evidence (Quality Assurance Council, 2013, p. 14). Due to the top priority attached to the quality of higher education alongside its mass expansion, Hong Kong has also witnessed high levels in recent rankings reached by its universities (UGC, 2010).

4.2. The Context of Hong Kong Baptist University (HKBU)

Amongst the 8 UGC-funded universities in Hong Kong, HKBU is a pioneer in focusing its ethos on whole person education. Celebrating its 59th anniversary in 2015, it offers a wide range of undergraduate and postgraduate programmes, leading to the awards of Bachelors', Masters', PhD and professional doctoral degrees as well as associate degrees. HKBU's student population numbers just under 10,000, of whom the majority (around 60%) is full time undergraduates. Under its blueprint of strategic themes and actions – Vision 2020, the University aims to develop itself into the regional leader in Whole Person Education (WPE) that delivers academic excellence and innovation. To ensure that the University is delivering and developing quality education in ongoing and self-enhancing ways, it warrants the development of a university-wide mechanism to collect a comprehensive set of evidence, not only for ascertaining how well students have achieved the learning outcomes, but also for responding to the public demand for accountability.

4.3. Outcomes-based Teaching and Learning (OBTL) at HKBU

With the global trend towards the adoption of the outcomes based approach to education, HKBU adopted the Outcomes-based Teaching and Learning (OBTL) approach, a form of OBE framework building upon the concept of constructive alignment (Biggs & Tang, 2003, 2007, 2011). In line with the quality emphasis of the University's strategies for teaching and learning, major changes in educational approach were made. These included the adoption of constructive alignment of intended outcomes, learning activities and assessment methods at the course level, right through to the alignment of course intended learning outcomes to programme intended learning outcomes, and then further aligning these to the University's Graduate Attributes. This emphasis on intended learning outcomes (ILOs) addresses not only the disciplinary content but also generic competences, hence has operationalised the ethos of Whole Person Education (WPE) by the embodiment of which into the Graduate Attributes. Students are encouraged to actively engage in the learning process where the focus is on what the student can achieve, rather than on what the teacher can teach. The primary aim of the OBTL implementation is to support

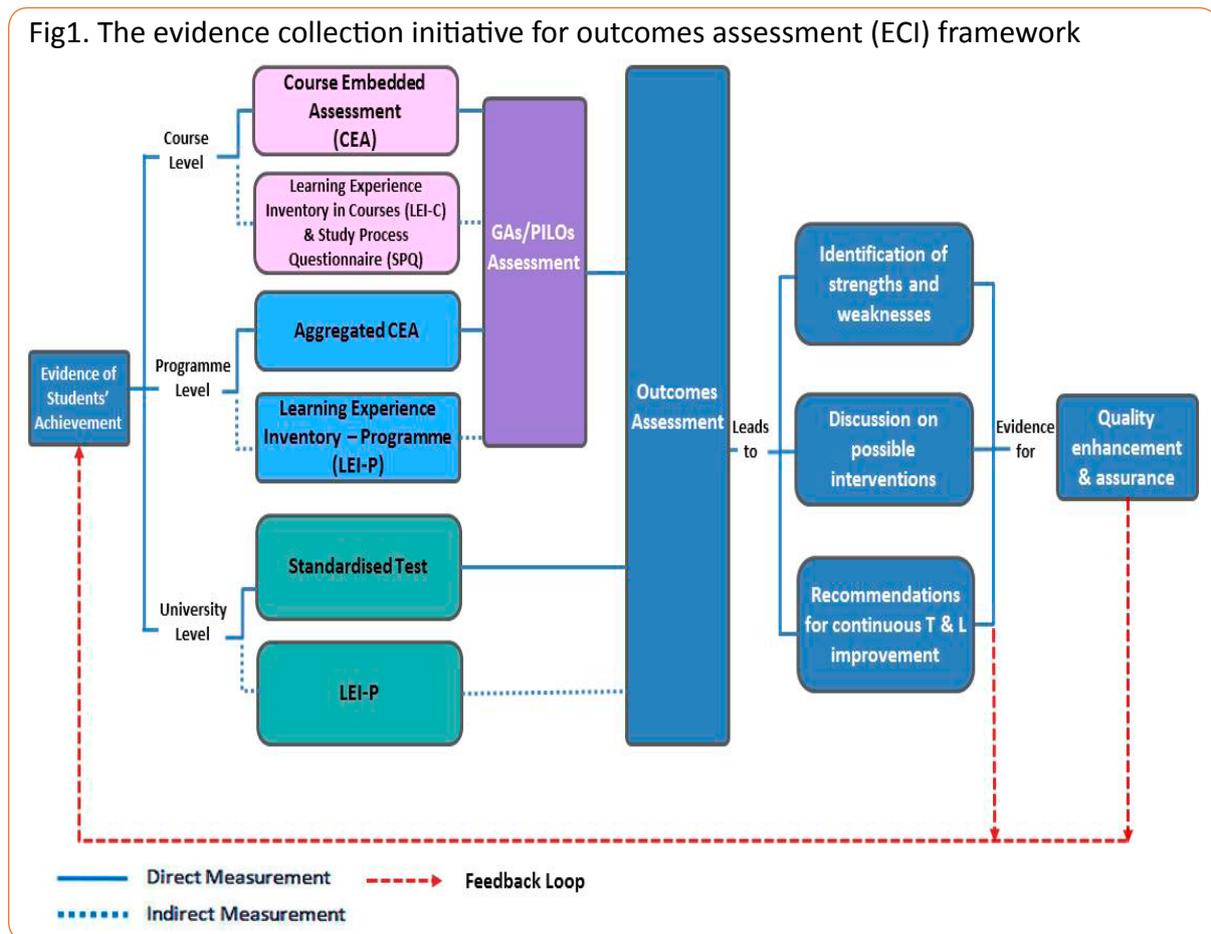
the continual quality enhancement of teaching and learning at HKBU. As such, the process to ascertain how well students have achieved the intended learning outcomes at course, programme and University levels – outcomes assessment – is of particular importance. This is the impetus for the development of the ECI Framework detailed in the following sections of this paper.

4.4. Generalisability

As one of the 8 public universities in Hong Kong, HKBU shares similar academic systems and infrastructures, and owes identical accountability to the general public with other 7 universities. Hong Kong recognises education as a key driver to promote its economic and social development. Hence it constantly gears itself to the latest international practices in higher education, in terms of educational models, quality assurance and pedagogies, so as to develop itself into a regional education hub. These endeavours have been well acknowledged internationally, reflected by the rising rankings attained by its universities. Therefore, the ECI Framework developed by this paper should have pertinent implications and can be applied to other local and international counterparts.

5. THE CONCEPTUAL FRAMEWORK

Evolving in HKBU’s context, the conceptual framework entitled Evidence Collection Initiative for Outcomes Assessment (ECI Framework) is shown in Fig.1. The ensuing sections elaborate its underlying principles, aims and objectives, and structure. The main elements and their relationships are also explained to show how they integrate together in helping collect valid and reliable sets of evidence.



5.1. Underlying Principles

The ECI Framework has the following underlying principles as its foundation:

- The OBTL approach represents the overarching concept adopted for the education environment;

Fig 2a. Diagrammatical illustration of constructive alignment

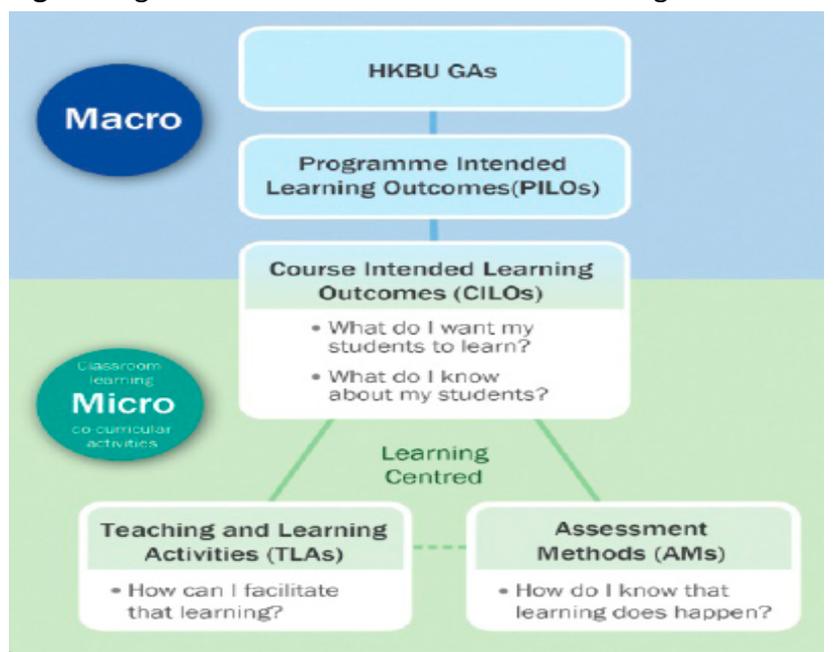


Fig 2b. Curriculum mapping under the constructive alignment of OBTL

GA-PILO Mapping Matrix

	Citizenship	Knowledge	Learning	Skills	Creativity	Communication	Teamwork
PILO 1		✓	✓				
PILO 2	✓						
PILO 3			✓		✓		
PILO 4		✓		✓		✓	
PILO 5							✓

PILO-Course Mapping Matrix

	PILO 1	PILO 2	PILO 3	PILO 4	PILO 5
Course 1		✓			
Course 2		✓			✓
Course 3					✓
...	✓			✓	
...				✓	✓
...		✓	✓		

- Under OBTL, the intended learning outcomes (ILOs) at course, programme and university levels are aligned through curriculum mapping (Fig. 2: a&b). At the course level, the teaching and learning activities (TLAs) and assessment methods (AMs) are designed to support students’ achievement of the course intended learning outcomes (CILOs); i.e. constructive alignment is being deployed (Biggs & Tang, 2007). Through their alignment with the programme intended learning outcomes (PILOs), the CILOs eventually enable students to achieve the university’s ILOs – entitled by HKBU as Graduate Attributes (GAs) (Table 1). These are generic outcomes based on the University’s Whole Person Education (WPE) ethos and hence constitute a level on top of all disciplines and programmes.
- In line with the notion of Criterion-Referenced Assessment (CRA) associated with the OBTL adoption (Biggs & Tang, 2003, 2007, 2011; Wong, Kwong, & Thadani, 2014), assessment criteria (e.g. rubrics) have been formulated from course to university levels.

- Therefore, assessments at the course, programme and institutional levels are not isolated, but linked together. As the mainstay of teaching and learning, institutions principally rely on the assessments at the course level to provide evidence in ascertaining how well the ILOs at programme and university levels have been achieved;
- Under such conceptual basis, outcomes assessment in this paper is defined as collecting evidence to ascertain how well students have achieved the PILOs, and by constructive alignment, the GAs (Figure 2: a & b and Table 1). It focuses on programme and university levels, since the ILOs at these two levels represent the students' exit awards and competencies.

Table 1. HKBU's 7 graduate attributes (GAs) for undergraduate students

Graduate Attributes (GA)	Descriptions
Citizenship	Be responsible citizens with an international outlook and a sense of ethics and civility.
Knowledge	Have up-to-date, in depth knowledge of an academic specialty, as well as a broad range of cultural and general knowledge;
Learning	Be independent, lifelong learners with an open mind and an inquiring spirit;
Skills	Have the necessary information literacy and IT skills, as well as numerical and problem-solving skills, to function effectively in work and everyday life;
Creativity	Be able to think critically and creatively;
Communication	Have trilingual and biliterate competence in English and Chinese, and the ability to articulate ideas clearly and coherently;
Teamwork	Be ready to serve, lead and work in a team, and to pursue a healthy lifestyle.

5.2. Aims and Objectives

Overall, the ECI Framework aims to provide an aggregate set of evidence for outcomes assessment – i.e. to ascertain how well students have achieved the intended learning outcomes (ILOs), based on a three-tier data collection mechanism in systematically collecting holistic and multi-faceted evidence of learning and teaching at the course, programme and university levels. It has the following objectives in which the first one is the premise for achieving the others:

- Providing evidence as to how well students have achieved the ILOs at course, programme and university levels, so as to fulfill the quality assurance process;
- Identifying the strengths and weaknesses in learning and teaching;
- Offering recommendations for the continuous improvements in learning and teaching;

5.3. Structure: Main Elements and their Relationships

The ECI Framework consists of three levels – course, programme and university levels. At each level, both direct and indirect data/evidence is collected. Direct evidence targets on students' actual performance, while indirect evidence revolves around students' learning experiences and their perceived achievement of learning outcomes. "Learning" entails a complex, multi-dimensional, integrated and incrementally growing process of students, it is anticipated that the outcomes assessment exercise should be able to shed some light on how learning has taken place. Indeed, outcomes assessment should focus on outcomes and also equally on the experiences that lead to those outcomes. To improve students' achievement of the outcomes, it is necessary to know about student experiences along the way, covering the curricula, pedagogies and the kinds of student learning activities that lead to particular outcomes achievement.

5.3.1. Course Level

Assessment tasks (i.e. the individual assignments) set for each course are used collectively to provide evidence on student performance. This is conveniently known as Course-Embedded Assessment (CEA), which is the adopted method for evaluation. The advantage of CEA is to utilize the strength of the existing assessment task – a major piece of student assignment – within the course that can best represent particular CILO(s) and the correspondingly aligned PILO to be assessed.

For the collection of indirect evidence, HKBU has made use of two instruments – (1) Study Process Questionnaire (SPQ) and (2) Learning Experience Inventory in Courses (LEI-C), aiming to examine how students’ changes in their learn approaches (i.e. deep versus surface) have been impacted by their learning experiences within courses. Both instruments were measured based on validated five-point Likert scales (5 = strongly agree; 3 = Neutral; 1= strongly disagree).

SPQ (Short version: R-SPQ-2F) is a 20-item instrument designed to evaluate students’ approach to learning (Biggs, Kember, & Leung, 2001). Conducting at both the beginning and the end of a study period, usually a semester (i.e. pre & post), the SPQ is to identify changes in students’ learning approaches, particularly whether students adopted the deep or surface approaches are influenced by their learning experiences. Deep Approach means that in a particular course a student is more likely to be motivated by intrinsic interests and would like to maximize the learning by engaging in a search for meaning, while Surface Approach indicates a student is more likely to be motivated extrinsically and would attempt to accomplish tasks with minimum duration and efforts (Biggs et al., 2001).

LEI-C is a 12-item instrument that is designed to gauge student learning experiences under OBTL, particularly about their perceived constructive alignment between ILOs (4-item), TLAs (4-item) and AMs (4-item) (Wong et al., 2014). This is measured by a term called Alignment Index, which attempts to quantify the extent to which students in any course are clear as to what they are to learn, and that they see the TLAs and the AMs they have experienced are addressing what they should be learning (Thadani, Kwong, Chong, & Wong, 2013; Wang, Su, Cheung, Wong, & Kwong, 2012). Sample items of the three sub-constructs are listed in Table 2. The instrument has good reliability (composite reliability = 0.923) (see Thadani et al., 2013; Wong et al., 2014 for more details).

Table 2. Sample Items of LEI-C

Construct	Sample items
Intended Learning Outcomes (ILOs)	“I had a clear idea of what I was to learn in this course.”
Teaching and Learning Activities (TLAs)	“The teaching and learning activities helped me learn what I was supposed to learn in this course”
Assessment Methods (AMs)	“I have achieved what I was supposed to learn in this course”

5.3.2. Programme Level

Aggregated CEA is adopted to collect the direct evidence, by integrating the evidence gathered via CEA of selected courses to ascertain how a particular PILO has been achieved. For each PILO, a number of the most representative courses are selected for assessment, usually these are core or compulsory courses. Regarding the indirect evidence, an in-house developed 22-item instrument – Learning Experience Inventory – Programme (LEI-P) is used to gauge the students’ learning experiences from their respective programmes, in terms of five constructs. Sample items of the five constructs are listed in Table 3; the instrument has good reliability (Cronbach’s alpha of constructs range from 0.76 to 0.91).

Table 3. Sample Items of LEI-P

Construct	Descriptions	Sample items
Clarity of outcome and assessment	Extent to which students perceived that Programme Intended Learning Outcomes, Teaching and Learning Activities and Assessment Methods in the programme are clear	"I have had a clear idea of what I was going to learn from this programme".
Engaging pedagogy	Extent to which students perceived that the pedagogies could engage them inside and outside classroom environment	"Teaching and learning activities in most courses have been brought real-life situations into classroom."
Level of cognitive skill involved	Extent of breadth and depth to which students perceived that cognitive skills are involved in learning at programme level	"Most courses in this programme emphasize more on what I have memorized than what I have been able to do."
Vigorous academic requirement	Extent to which students perceived that academic requirements have set high but achievable requirements	"Faculty members in my academic programme set high standards for students."
General satisfaction	Extent to which students perceived that their university life experiences are satisfactory	"I am satisfied with my academic learning experience in the programme."

5.3.3. University Level

At the institutional level, selected standardised tests benchmarked to local and international thresholds have been adopted to gather direct evidence of students' achievements of the university-level learning outcomes—7 Graduate Attributes (GAs) for undergraduate students. In order to benchmark with international standards, the ETS Proficiency Profile (ETS) developed by the US-based Educational Test Service is selected after comparison with other similar tests, considering its suitability in covering the HKBU GAs. To meet local benchmarks, an instrument entitled Academic Proficiency Test (APT) is employed by adapting from the HKSAR Government's common recruitment examination for the selection of civil servants. The ETS and APT form the academic tests conducted at the institutional level at HKBU for direct evidence collection. For indirect evidence, the second part of the LEI-P is used to collect data to measure students' self-perceived achievements of 7 GAs. Table 4 summarizes the instruments adopted in this study.

Table 4. Summary of Instruments adopted in the ECI Framework

	Direct assessment	Indirect Assessment
Course Level	Course-embedded Assessment (CEA)	<ul style="list-style-type: none"> • Study Process Questionnaire (SPQ) • Learning Experience Inventory in Course (LEI-C)
Programme Level	Aggregated CEA	<ul style="list-style-type: none"> • Learning Experience Inventory-Programme (LEI-P)
University Level	Standardised tests <ul style="list-style-type: none"> • ETS Proficiency Profile (ETS) • Academic Proficiency Test (APT) 	<ul style="list-style-type: none"> • Learning Experience Inventory-Programme (LEI-P)

5.4. Main Approaches

A tracking approach is adopted to monitor the learning progress of students from admission onwards. Students from the first, intermediate and final years are invited to partake the various instruments, for gauging their baseline academic level, tracing their learning progress and finally ascertaining how well they have attained the learning outcomes. Triangulation is applied to collate and integrate data and evidence from multiple instruments, perspectives and different timelines to facilitate the drawing of conclusions (Berg, 2009; Mathison, 1988). It does not matter whether the evidence shows convergence, inconsistency and contradiction, effective triangulation can help formulate holistic and thoughtful recommendations and implications for enhancement (Judd & Keith, 2012).

5.5. Evaluation and Feedback

Based on the holistic picture of evidence from the multi-faceted sources, strengths and weaknesses in student learning will be identified that help provide recommendations for improvements. After implementation, improvements will be exhibited in the evidence of student learning. From this sense, the ECI Framework represents a continuing system to assure and enhance the quality of learning and teaching.

6. IMPLEMENTATION AND SOME EMPIRICAL RESULTS

The ECI Framework has commenced its implementation from the 2012-2013 academic year (AY2012-13). The following sections outline some results to show how it works, using the General Education (GE) Programme as an example. GE can represent the institutional level learning outcomes, since 'they are the knowledge, skills and competencies all graduates of the institution can be expected to demonstrate, regardless of the major' (Judd & Keith, 2012, p. 33). Considering the significance of GE in the whole undergraduate programme, both direct and indirect evidence gathered therefrom, which are aligned to HKBU's institutional learning outcomes, it is believed that using GE programme as an example can offer a preliminary picture of to what extent the students have achieved the university-level learning outcomes. In this paper, a number of representative GE courses aligned to the GE PILOs to be assessed in AY2012-13 were included in the exercise.

In line with the ECI Framework, Aggregated CEA was directly adopted for the outcomes assessment exercise in AY2012-2013. Among the representative courses identified for each GE PILO, student works that could best evaluate a particular PILO were selected for assessment, such as projects, essays, journals or term papers. Since PILOs assessment is on top of each course, the representative student works from each course were pooled together for assessment. To streamline the process and ensure the exercise was manageable, a sampling approach was deployed according to established statistical norms rather than covering every piece of student works. For the assessment, a set of generic rubrics (i.e. university-level assessment criteria) developed for the 7 Graduate Attributes were used, these were termed as Graduate Attribute Rubrics (GA rubrics) which development was made references to the VALUES Rubrics by the Association of American Colleges & Universities (AAC&U). Course instructors involved in the outcomes assessment exercise decided collectively which GA rubric was most appropriate for a particular PILO to be assessed. The GE PILOs were all aligned to the 7 Graduate Attributes, facilitating appropriate adoption of the relevant GA rubrics in the exercise. The whole assessment process was aided by an assessment-specialized IT system – Blackboard Learn and Outcomes, which provides functions for online assessment and report generation. The results of the PILOs assessment did not affect the grades assigned by instructors to their students in the respective courses, rather, the results primarily assisted curriculum enhancement.

Outcomes assessment completed with the direct evidence collected indicated that students were on the right track in achieving their respective PILOs, this was supported

by the indirect evidence results (from the SPQ and LEI-C) showing that students had perceived their improvement in the corresponding abilities specified in the 7 GAs (Table 5).

Table5. Direct and Indirect Evidence Collected for the Assessment of selected GE PILOs (AY2012-13 and AY2013-14)

GE PILOs Assessed	Graduate Attributes (GA) Assessed	Core Categories	Direct Evidence – Generic Rubrics	Indirect Evidence – Students’ self-perceived achievements (5 as maximum mean score)
Communicate effectively as speakers and writers in both English and Chinese	Communication	Languages	Written Communication Average score: 2.6 (5 criteria, with ‘4’ as the maximum mark for each)	4.1
Apply appropriate mathematical reasoning to address problems in everyday life	Skills	Quantitative Skills	Quantitative Reasoning Average score: 2.7 (6 criteria, with ‘4’ as the maximum mark for each)	4.0
Use historical and cultural perspectives to gain insight into contemporary issues	Creativity	Critical Thinking	Critical Thinking Average Score: 3.0 (4 criteria, with “4” as the maximum mark for each)	4.0
Apply various value systems to decision-making in personal, professional, and social/political situations	Citizenship	Ethics	Ethical Reasoning Average Score: 2.5 (5 criteria, with ‘4’ as the maximum mark for each)	4.4

On a less positive note, it was observed that students’ adoption of Deep Learning Approach declined over the semester. Although the exact reasons are still being investigated, a plausible explanation could be that students taking the GE courses were normally at their first year of study, hence would have high learning expectations to the new tertiary learning environment when they completed the pre-survey at the start of the semester. While the post survey was conducted at the semester end, when students were busily fulfilling the requirement of the courses (i.e. submission

of assignments; preparing for final examination), this might have led to students adopting the Surface Learning Approach (Zhang, Biggs, & Watkins, 2010). Since both the direct and indirect evidence from the GE programme was based on the assessment criteria for Graduate Attributes (GAs) (university-level learning outcomes), the assessment results together with the evidence collected from other instruments thus far, suggested that students as a whole attained good numerical skills but need to improve in their communication skill in writing and reading English.

By identifying the strength and weakness of student learning, follow-up actions have been taken to address the gaps. For the GE programme, feedback was conveyed to the relevant instructors and used in planning the ensuing ECI in AY2013-14, with a particular focus on the communication competency. On the remedial front to provide more direct assistance to students, foundation language courses will be revamped while the intensive writing courses are recommended to be offered to senior year students. Moreover, in order to close the feedback loop, the evidence collected and the outcomes assessment approaches have been disseminated to the university community via both formal and informal channels, including reports to university committees at various levels, faculty/departmental briefings, and university-wide teaching and learning sharing sessions for continuous quality enhancement and assurance.

7. LIMITATIONS

Since the ECI Framework has been piloted for two academic years, the evidence gathered up to now are described above, therefore the lack of a full set of evidence is the major limitation of this paper. Given that the GE programme represents one-third of the whole undergraduate programme, both the direct and indirect evidence gathered therefrom are aligned to the GAs and assessed based on the GA rubrics, the outcomes assessment conducted thus can offer an initial scenario as to what extent students have achieved the university-level learning outcomes (the Graduate Attributes). It is envisaged that as more student learning evidence is accumulated with continued adoption of the ECI, better triangulation of the data/evidence collected from various means will result.

8. CONCLUSION AND REFLECTIONS

This paper attempts to address an explicit gap in outcomes assessment – the lack of a conceptual framework – to guide evidence collection for ascertaining the students' achievements. The ECI Framework has been developed in the context of Hong Kong where its higher education sector is actively responding to public demand for accountability in demonstrating educational effectiveness.

Via an initial pilot in AY2012-13, empirical results support that the ECI Framework has been effective in guiding the collection of multiple forms of evidence and aggregating them into a holistic picture. This conclusion thus helps in the derivation of some useful reflections. First, under the constructive alignment of OBTL, it is suggested that only the integration of the course, programme and university levels can constitute a comprehensive framework of evidence collection. The mainstay of the ECI framework lies at the course-level using Course Embedded Assessment, coupling with the standardized academic tests administered at the university-level for overall monitoring. Second, the Aggregated CEA is a new practice initiated by the ECI Framework; it suggests that outcomes assessment for programmes can essentially be realised, by pooling the representative student assignments from each representative course together and assessing them by the criteria set for institutional-level learning outcomes. Third, though direct evidence has been widely collected, this paper further argues that the sound judgment cannot be made without indirect evidence; in another words, direct and indirect data should be adopted inseparably, since learning outcomes cannot be effectively attained without their commensurate learning experiences. The exact role of indirect evidence is worthy of further inquiries.

In general, the ECI Framework has basically fulfilled its three objectives. Its implementation in two academic years has provided a multi-faceted set of evidence to help ascertain to what extent

students have achieved the university-level learning outcomes and identify the strength and weakness in student learning. Based on this information, follow-up actions have taken to help enhance teaching and learning. Last but not least, any newly-developed conceptual framework requires ongoing tests, this one is not without exception. Further empirical works should be carried out to accumulate more data to identify and elaborate the exact relationships between the different instruments and demonstrate how the data/evidence can be triangulated to iron out inconsistency and contradictions.

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Appendices

Appendix 1 – 11 Tailor-made Questions (5 strongly agree; 1 = strongly disagree)

1. I have learned the knowledge in other disciplines from this course.
2. To what extent do you think this course has helped enhance your abilities to:
 - a. think ethically and make ethical judgment
 - b. become responsible to the society and get along well with people of different cultures
 - c. build up your self-identity and continue to develop yourself
 - d. use information and information technologies effectively
 - e. apply logical/mathematical reasoning to handle and solve problems independently
 - f. create new ideas
 - g. analyze and criticize ideas from different angles
 - h. communicate effectively through oral and written English and Chinese (both Cantonese and Putonghua)
 - i. participate actively and work effectively in team
 - j. have a healthy physical and mental lifestyle

Appendix 2 – List of Acronyms

Acronyms	Full Name
1. AMs	Assessment Methods
2. APT	Academic Proficiency Test
3. CEA	Course-Embedded Assessment
4. ECI	Evidence Collection Initiative for Outcomes Assessment
5. ETS	ETS Proficiency Profile
6. GA	Graduate Attribute
7. HKBU	Hong Kong Baptist University
8. ILOs	Intended Learning Outcomes
9. LEI-P	Learning Experience Inventory – Programme
10. LEI-C	Learning Experience Inventory in Courses
11. OBE	Outcomes-Based Education
12. OBTL	Outcomes-based Teaching and Learning
13. PILO	Programme Intended Learning Outcome
14. SAR	Special Administrative Region
15. SPQ	Study Process Questionnaire
16. TLAs	Teaching and Learning Activities
17. UGC	University Grants Committee
18. WPE	Whole Person Education

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