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Framing and Consolidating the Assessment of Outcome-Based Learning (OBL) in higher institutes in Hong Kong: An example case demonstration

Jerf W. K. YEUNG¹, Ai-Choo ONG²

Abstract

Aiming at providing quality teaching and learning in higher education, the pendulum of education has recently swung back to Outcome-Based Learning (OBL), in which higher education institutes need to assess the extent to which they have attained those learning outcomes planned for their students. However, OBL assessment is still at its developmental stage with amorphous nature. For this, the present paper proposes a mixed-method approach and consolidates the assessment by providing different methods, namely expert-panel assessment, qualitative longitudinal study, institute-level survey, and course-level evaluation, as means of obtaining more precise results. Integrating findings from different methods is also briefly discussed.

Keywords: assessment; mixed-method approach; outcome-based learning; learning outcomes.

Introduction

Recently the pendulum of education in higher institutes has swung back to a renewed focus on student learning, which aims at providing quality and assurance education to its students (Dodridge & Kassinopoulos, 2003; Rust et al., 2003; Tavner, 2005). Therefore, the term of “Outcome-Based Learning (or Education) (OBL)” has sprung up in tandem with the above mentioned paradigm shift. Along

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with the concept and notion of OBL prevailing among higher education institutes worldwide, some of the most fundamental and underlying issues are still remained unsolved and divergent, which regard what we need to assess (scope), how can we go to assess (methodology), as well as why these should be assessed that are deemed as with significance (level). As such, scope, methodology and levels of assessment in OBL have long been divergent among scholars (Hsu & Lin, 2005).

In fact, OBL can be traced back to the behavioral objectives movement in 1960s in the US, which advocates of writing specific and clear statements of observable outcomes (Mager, 1984). However, there are diverse definitions proposed by different scholars regarding the nature of OBL. For example, Bingham (1999) stated that “Learning outcomes are an explicit description of what a learner should know, understand and be able to do as a result of learning”; Donnelly and Fitzmaurice (2005) described OBL as “A learning outcome that is a statement of what the learner is expected to know, understand and/or be able to do at the end of a period of learning”; and Adam (2004) mentioned that “A learning outcome is a written statement of what the successful student/ learner is expected to be able to do at the end of the module/ course unit or qualification”; as well as in the remarks by Spady (1994), OBL means “clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences”. However, no matter what definitions used to delineate OBL, one thing to be sure is that a set of observable or demonstrable learning outcomes can be exhibited by the learners/ students themselves after successful completion of a prescribed period of learning process.

Taken from what mentioned above, one of the main focuses should be shifted to the scope of assessing those learning outcomes. In fact, OBL assessment is something more flowing rather than concrete. Thereby, it is difficult to use a clear-cut and unidimensional method approach to conduct OBL assessment. This is because different higher institutes may have different educational philosophies and mottos, and students may receive different expectations of professional developments while enrolling in different study programs/ majors even they commonly belong to a same institute. Nevertheless, all knowledge and professional skills imparted through the process of learning in higher education can be generally divided into two main domains (Adam, 2004; Kennedy et al., 2005): (1) Subject-area related outcomes/ competences, which is specific to a field of study; (2) Generic outcomes/ competences, which is common to all learners in higher education (e.g. the ability of problem-solving, being a responsible citizen, and work with colleagues cooperatively).

In addition, some scholars would like to categorize learning outcomes by levels. In principle, there are three levels of learning outcomes that a student is expected to acquire after completion of a learning process (Allen, 2006; Huba & Freed, 2000). They are: (1) course-level outcomes/ competences; (2) program-level outcomes/ competences; (3) and institutional-level outcomes/ competences.

In a logical sense, a higher-level competence will incorporate the capabilities gained in the lower levels, and the generic competences acquired at the program- and institutional levels should be consonant and tantamount in nature. However, no matter how we are going to categorize the nature of the learning outcomes that are being assessed, they should be something that are observable, demonstrable and (even) measurable and as well these outcomes are thought beneficial for growth and success of the learning students (Hsu & Lin, 2005; Huba & Freed, 2000). Assessing students' learning outcomes must be related to a valid assessment strategy in a temporarily causal fashion (Hsu & Lin, 2005; Scriven, 2005), which involves issues of longitudinal research designs and operations. For this, an assessment strategy must involve how to comprehensively research and demonstrate those learnt competencies from students who have presumably successfully completed a course or a program in a higher institute, which would also be a crucial cornerstone of OBL assessment (Fournier, 2005). Obviously, the nature and scope of OBL have been vividly discussed by scholars in literature over the years, albeit efforts contributing to what should explicit evaluation methods, kinds of assessment instruments, as well as the levels of units of observations be conducted have appeared to be meager (Huba & Freed, 2000; Tavner, 2005). As such, the present paper attempts to conceptualize an assessment framework for OBL in local higher institutes in Hong Kong.

Going back to the basics, assessment of student learning outcomes is something with footing in multi-dimensional nature, although some researchers considered that OBL is apparently amorphous (Kennedy et al., 2005). In a similar vein, it is adequate to employ multiple approaches in researching and evaluating intended learning outcomes in a higher educational setting. As such, we considered more adequately by using mixed research methods in combination with both formative and summative evaluation processes through cooperation by multiple parties (e.g. students, faculty, and executives) in an institute to sublimate findings of OBL assessment in order to achieve the results with width and depth (Greene & Caracelli, 2005).

Multiple/ Mixed-Method Approach

As aforementioned, assessment of student learning outcomes is something multi-dimensional. Therefore, it should employ mixed-research methods to collect data and assess findings from different angles. Use of Mixed-research methods connotes a combination of both quantitative and qualitative methods in the sense of manipulating multiple approaches in order to find out more comprehensive answers to research questions and offset the limitation of one method over others (Creswell & Creswell, 2004; Singleton & Straits, 2010). In addition, some scholars extended the above-mentioned definition of mixed-research methods; they

deemed that, in addition to the combination of both quantitative and qualitative methods, mixed-research methods, or some researchers would like to term it as multi-method studies (Creswell & Creswell, 2004; Fielding & Fielding, 2005), could be either quantitative or qualitative by using different methods of data collection and conducting analysis within a single research paradigm (Singleton & Straits, 2010). The advantages of employing of a multiple-research approach could be summarized in tandem with what Fielding and Fielding (2005) said

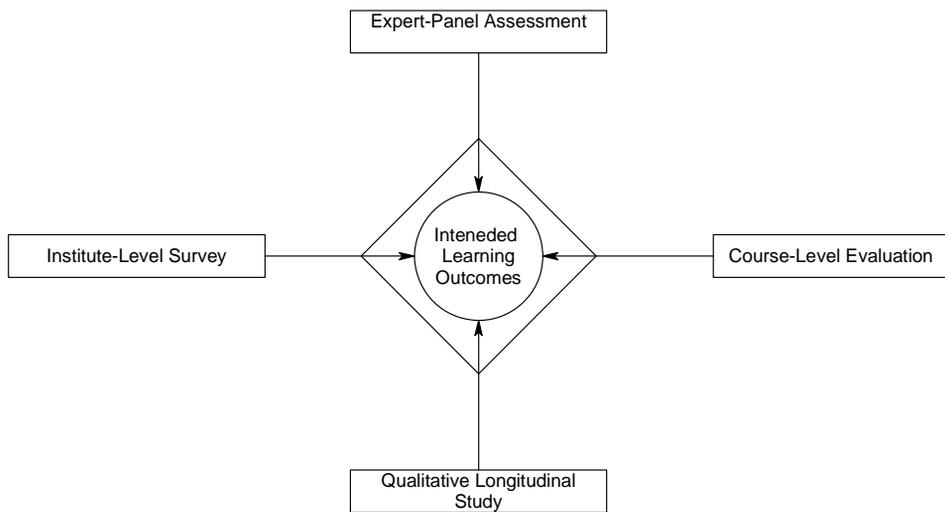
“(t)he advantages of combining methods do not require that we ignore that different approaches are supported by different epistemologies. Accepting the case for interrelating data from different sources is to accept a moderate relativistic epistemology, one that justifies the value of knowledge from many sources, rather than elevating one source. Taking a triangulation or multiple-method approach is to accept the continuity of all data gathering and analytic efforts (p.560)”

For this, in order to research those complex and multi-faceted social phenomena or issues, like OBL assessment, it appears to be more legitimate to use a mixed-method approach. In fact, the contention regarding selection of research methods becomes more mature as the perspective having shifted from the emphasis on the supremacy of one method over the other to the reciprocity of choosing different methods concurrently in researching the same question. As Singleton and Straits (2010) stated that

“(t)oo often in social research, methods are not chosen or created to fit the task but have become ideologies that define what to study and how. Qualitative research is valued over quantitative (or vice versa); comparative historical methods are valued over survey research field research is valued over experimentation. These dogmatic positions, however, obscure the fact that all conclusions in social research rest on the resolution of the same basic issues... In short, the focus of social research should be on what one wants to know and why rather than on how to apply a particular approach. We must be capable of applying particular techniques and methods, to be sure, but these should not be treated dogmatically lest their application become an end in itself (pp. 449-450).”

Taken together, we propose to adapt a mixed-method approach to assess outcomes of OBL in local higher education in the form of combining the four following data collection and analysis designs: (1) expert-panel assessment; (2) course-level evaluation; (3) qualitative longitudinal study; (4) institute-level survey.

Figure 1. Assessment Model for Outcome-Based Learning



Each of these four research designs could incorporate in more than one analytical method. We believe that by integrating findings through the angles generated from these four designs collectively could provide more integral and precise results to sketch out the extent to which an institute has achieved the teaching merits in terms of quality and quantity. The respective research designs will be discussed more in details below; and Figure 1 depicts the theoretical model of OBL assessment through mixed-method approach, which portrays the functions of different research designs used to find out information related to those intended learning outcomes.

Functions of expert-panel assessment, qualitative longitudinal study, institute-level survey, and course-level evaluation

Expert-panel assessment

Formation of an expert-panel assessment is regarded as a top-down assessment approach, in which a broad of members who are with expertise in a specific field of higher education will be invited to join a panel in purpose of evaluating the teaching materials and documents of different programs, curricula and courses offered by the institute, as well as those teaching and supporting services advocated by the institute aimed at achieving the intended outcomes (including generic outcomes) from OBL. The major aim of expert-panel assessment is to see OBL

learning whether measures up to the learning outcomes planned beforehand through concretizing the contents of the materials and documents at different levels. For example, there would be two approaches to formulate assessment panels; one approach is to form panels by corresponding to different faculties/ departments; another approach is to form panels by according to different academic programs. Therefore, there will be different assessment panels responsible for evaluating learning outcomes of OBL in different faculties/ programs.

In addition, members of a assessment panel may also review the portfolios of students who have been randomly selected in the qualitative longitudinal study³; and these members may employ rubrics provided as indicators to judge growth and achievements related intended outcomes of OBL of the randomly selected students to see whether they have achieved those intended outcomes expected for them since their enrolment in the institute (Huba & Freed, 2000). Rubrics is a set of criteria and standards linked to intended outcomes for assessing students' performance on these outcomes through evaluating course assignments, self-reflection and learning log assignments as well as final year honor projects as the evidence records for OBL (Hsu & Lin, 2005; Kennedy et al., 2005). As such, the panels will judge whether students from different programs/ departments may have improved in those intended learning outcomes over their period of learning in the institute.

Qualitative longitudinal study

The incorporation of qualitative analysis in OBL assessment is that this approach can provide experience and process insights that are hard to be captured by using other research designs. In fact, use of qualitative approach can render advantages in formative inquiry (Doucet & Mauthner, 2008; Singleton & Straits, 2010). As qualitative analyses are judged to be suitable in OBL assessment because this approach evinces “the ways people in particular settings come to understand, account for, take action, and otherwise manage their day-to-day situations (Miles & Huberman, 1994, p. 7).” By employing this approach, researchers are likely to know personal and individual feedback and experiences of students in outcome-based learning and how they make sense of and enact in this process (Denzin & Lincoln, 2000). First of all, use of individual in-depth interview and focus group interview methods, as Singleton Jr. & Straits (2010) stated, can take the benefits of questioning “participants about their feelings, motives, and interpretations of events. These reactions not only are likely to be of direct interest to the researcher but often serve as critical validity checks on the researcher’s inferences (p.367).” For this, in the qualitative analyses, researchers can use interviewing to investigate students’ individual growth and learning experiences in the institute. More than that, student interviewees’ opinions and comments suggested in the interviews

³ Sampling method of student participants in the qualitative longitudinal study is discussed later.

can be taken as a means of improvements and enhancement of teaching and learning issues. In addition, the application of interviewing can be extended to teaching staff in purpose of acquiring their views and difficulties encountered during the process of conducting OBL teaching.

For tracking and capturing changes occurring over times in students' circumstances and perceptions in OBL, qualitative longitudinal study would be an appropriate way to fulfill this function as it is possible in manifesting transitions and trajectories of individual experiences temporally and longitudinally (Elliott et al., 2005); for example researchers should randomly select a study cohort/ panel sample of students and trace the changes and growth of these students for their changes in learning outcomes over times. What distinguishes qualitative longitudinal research from those common qualitative analyses is that qualitative longitudinal research adopts a deliberate way in which temporality is designed into the research process making change as a central focus of analytical attention (Holland et al., 2006). In the same vein, Vallance (2005) proposed that qualitative longitudinal research is a kind of qualitative studies, which is employed to examine developmental and causal relationships and should consists of three elements: 1) a prospective research design, 2) a sample of participants that include data collection over time, and 3) involvement of analysis that explicitly addresses change over time for individuals. Therefore, employment of qualitative longitudinal research in OBL assessment can take the advantage of acquiring formative information in a longitudinal transitive way.

Owing to the employment of qualitative longitudinal research in OBL assessment as a crucial bottom-up approach to understand students' transitional experiences in OBL, the issue of selection of a cohort/ panel of study sample that could be "representative" enough of the study population will become an imperative concern. In this sense, to select a panel/ cohort of student participants during the course of OBL assessment is crucial in tracking and soliciting their perceptions and experiences usefully in response to OBL across times. Thereby, this approach can be called as panel study in a qualitative research paradigm, in which panel study is a type of longitudinal study through collecting qualitative information from the same group of participants at several time points along their learning process (Miller & Salkind, 2002). For this, selection of a representative cohort of student participants can lead to another issue of concern, which is how to sample a "representative" panel/ cohort of student participants for the qualitative longitudinal research over time.

For this, the following steps in selecting a representative cohort sample of students should be noted: (1) it should employ probability sampling theory⁴ to select a study panel of student participants at the onset of an academic year (e.g.

⁴ Probability sampling theory in sampling connotes that a sample of individuals from a population (says all year-one students) must contain essentially the same variations that exist in the population.

Year-one freshman students at their enrolment); (2) During the course of using the probability sampling theory to sample students participants, the equal probability of selection method (EPSEM)⁵ should be strictly clung to. A clear sampling frame⁶ with random selection approach⁷ through stratification method⁸ should be adapted; (3) After a panel of student participants being selected, longitudinal qualitative interviewing should be adopted to collect data from those selected student participants at designated time-specific intervals.

If a learning institute provides twenty academic undergraduate programs from 10 departments, the academic programs could be used as the sampling frame to stratify all potential student participants into different groups. As such, the students studying at the same academic year may have an equal chance being selected as a sample of study. Second, each student from respective programs are assigned a number from 1, 2, 3, 4...N, until the numbers assigned equal to the exact numbers of students enrolled in a specific program. Followed as a certain proportion of students from a specific program will be drawn by using a random-number table (e.g., 10% of 180 year-one BEd program students denote that there are 18 students who will be randomly selected as a study sample of participants in the BEd program). However, during selection of participants, equal probability of selection method should be applied strictly through using the random number table. Third, after randomly drawing student participants from all undergraduate programs, there will be 10 subgroups of a cohort sample that are considered to be representative of the total study population at the same learning year in the learning institute. As a result, these 10 subgroups of the cohort sample that can be traced longitudinally in order to investigate their learning experiences and growth in specific areas that are thought to be directly related to the intended outcomes in OBL.

Institute-Level Survey

On the other hand, it is very helpful to conduct institute-level survey with a prospective design to investigate students' changes in learning outcomes, espe-

⁵ SPSEM means a sampling design in which each member of a population has the same chance of being selected into the study cohort.

⁶ Sampling frame is a complete list of units composing a population from which a sample is selected. If the sample is representative of the population, it is essential that the sampling frame include all or almost all members of the population.

⁷ Random selection implies that once a sampling frame has been properly established, to use random selection process to select participants by assigning a single number to each potential participant through drawing a number randomly in a random-number table.

⁸ Stratification means that appropriate proportion and numbers of participants can be drawn from the homogeneous subsets/ subgroups of the total population (e.g. all year-one students in different departments or enrolled in different programs are being drawn randomly by basing on certain percentage)

cially for those generic outcomes, e.g. problem solving ability and critical thinking, which are expected to be applicable to all learning students regardless of what majors or disciplines these students studying for. For surveying with prospective design, it is research in which the participants are contacted by researchers and asked to provide information about themselves and their circumstances on a number of different temporal occasions (Elliott et al., 2005). Therefore this approach is useful to trace the transitional trajectories of the learning of students during their study in the institute (Duncan, 2001; West et al., 2004). In fact, Allen (2006) proposes that “surveys can also be used to ask students’ opinions about proposed changes in courses or programs (p190).” One thing should be borne in mind is that, due to several temporal time points that may involve in the survey, indicators being investigated and socio-demographics as well as other possible peripheral covariates considered as vital confounders must be apparently and orchestratingly tackled in the initial stage of the surveying (Miller & Salkind, 2002). As such, information regarding some variables with temporal significance is formidable to collect in later occasions when time elapses. Taken together, longitudinal survey could be one of the most evincing empirical evidence to support the causality for a given topic, for which Elliott et al. (2005) stated that

“(p)erhaps the major advantage of longitudinal data over cross-sectional data in understanding the possible causal relationships between variables is its ability to take account of omitted variables. Quantitative longitudinal data enables the construction of models that better able to take account of the complexities of the social world and the myriad influences on individuals’ behavior (p.239).”

In addition to using longitudinal institute-level survey to investigate students’ transition in their learning experiences, employment of a one-off survey at the final year to obtain an overview of the learning students regarding their individual retrospective perceptions and attitudes about their past teaching and learning environments in the institute could be a very useful reference source to improve OBL in the future. Apparently, this one-off survey is not necessary to be a single independent survey study; it could be acted as an “add-on part” in the final wave of the longitudinal institute-level survey. This may take the advantage that information about students’ perceptions and attitudes in the “add-on part” of the longitudinal institute-level survey can be served as supplementary data, e.g. covariates or confounders, in the analysis of the longitudinal survey. For example, those students who showed a highly appreciable attitude to the teaching quality of the faculty and more enjoyable involvement in campus life would be expected to fend for their learning more seriously and gain more in OBL. Therefore, institute-level survey is a core component in the mixed-method approach to provide quantitative casual information about students’ learning outcomes over a certain period (Hsu & Lin, 2005; Suskie, 2004). To this end, use of a mixed-method

approach in form of integratively adopting expert-panel assessment, course-level evaluation, qualitative analysis, as well as institution-level surveying could render findings of OBL research to be more precise and multi-dimensional, which is able to complement the shortcomings by employing any single methods only (Miller & Salkind, 2002).

Course-Level Evaluation

For course-level evaluation, it is considered suitable to use multiple means of data collection with an aim to study whether the intended learning outcomes of a specific subject/ course offered by the institute to its learning students have been achieved the desired expectations. Like OBL assessment, evaluation of course outcomes should employ multiple methods to collect multidimensional data in order to give lens to different angles of the teaching qualities and learning outcomes in a given subject. Being more concrete, a traditional pretest and protest design of longitudinal questionnaire survey is a familiar method to assess the changes of students' progress of certain specific learning outcomes related to a subject matter in a given course. In addition, conducting an end-stage questionnaire survey after completion of a course in purpose for grasping an overview of students' comments, perceptions, and feelings on the goals, objectives, contents, teaching and delivery modes of that course is useful to elucidate the extent of success of the completed course from the view of student learners. More than that, program leaders can arrange group interviews of the learning students from a particular course to explore the merits and drawbacks of that particular course to see what is needed to improve in order to achieve long-term optimization of the course in alignment of the overall development of students toward those intended outcomes. In other side, teaching faculty are encouraged to write down comments on a standardized format through self-reflection after the completion of a teaching course, which would be valuable in tapping useful insights, potential impediments as well as unmet needs considered as beneficial to improving learning outcomes of students from the angles of teaching staff.

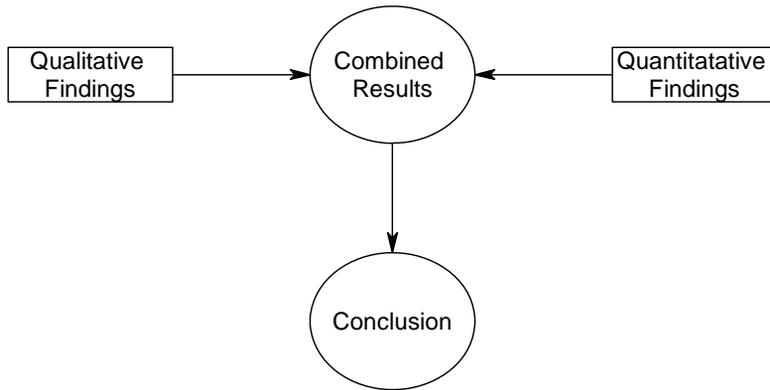
Discussion

Due to the multidimensional nature of OBL assessment, adoption of mixed-method research approach could cater for the needs of portraying different angles in findings of OBL assessment, which is consonant with what Creswell and Creswell (2004) describe the usefulness of adopting mixed-method research to investigate those complex and intertwined social topics:

“This utility can be seen in two procedures for mixing. First researchers can integrate or converge the quantitative and qualitative data by collecting both forms of data and combine, integrate, or compare the two data sets. This

integration requires some thought because it involves merging numeric data with text data. A typical procedure is to integrate the two forms of data in a discussion section of a research article by first stating a statistical finding and then illustrating the finding with a qualitative quote (p. 318)."

Figure 2. Diagram for Dipping the Combination of both Qualitative and Quantitative Findings in Interpretation og OBL Results



Put things into simple, figure 2 depicts the graphical interpretation of combining both quantitative and qualitative information into an agglomeration of findings. In the process of interpreting and illustrating findings generated from quantitative and qualitative methods, researchers should be heedful of what common themes that are both supported by the quantitative and qualitative data and what inconsistent areas that seem to be contradictory from the two data sources. Therefore, it would be appropriate to always use an integrative and comparative approach to interpret the quantitative and qualitative data in hand, as different research methods may have its own strength and inadequacy and these methods are always mutually complementary in nature (Fielding & Fielding, 2005; Scriven, 2005).

Table 1. Characteristics of Different Methods				
Epistemological Accuracy	Institute-Level Survey	Qualitative longitudinal study	Expert-panel assessment	Course-Level Evaluation ^a
1 Cognizance of the formative results	L	H	M	H
2 Cognizance of the summative results	H	L	M	H
3 Issues of reliability	H	M	M	H
4 Issues of validity	H	L	M	H
5 Sampling errors and bias	L	M	M	L
8 Ability to replicate	H	M	M	H
Note. L= Low, M= Mediate, H= High.				
^a Course-Level Evaluation can be said as an outcome-based learning assessment in miniature, in which multiple methods are suggested to use as a means to collect needed information for course improvement.				

Table 1 shows the characteristics of strengths of different methods in OBL assessment. Cognizance of the formative results implies whether the method adopted may help to increase our understanding of the process assessment of OBL. In this sense, both qualitative longitudinal study and course-level evaluation may be useful in enhancing results of formative assessment as these two approaches can generate insightful qualitative data. On the other hand, for cognizance of the summative results in OBL assessment, institute-level survey and course-level evaluation could help in spawning quantitative data for this purpose as close-ended questionnaire survey may be adopted in these two research approaches. In addition, reliability is a statistical term meaning the consistency of a variable that does not contain error (Singleton & Straits, 2010). Therefore, both quantitative data from the institute-level survey and course-level evaluation may have high reliability, given a good questionnaire design has been orchestrated in prior (Miller & Salkind, 2002). In addition, reliability denotes to the goodness of fit between an operational definition and the concept purported being measured (Singleton & Straits, 2010). In this case, again the institute-level survey and course-level evaluation would have high capacity to check on whether their data tend to be valid. For sampling errors and bias, as both qualitative longitudinal study and expert-panel assessment may use equal probability sampling method to select a relatively ‘representative’ cohort of the study sample. As such, problems of sampling errors and bias of these two research approaches, for they are more qualitative in nature, in OBL assessment may be apparently soothed (Singleton & Straits, 2010; Walliman, 2006). In addition, the institute-level survey and course-level evaluation may be assumed to incorporate the whole constituents of learning students, thereby issues of sampling errors and bias would not be a concern. On the other hand, replication of findings in research approaches of institute-level survey and course-level evaluation are considered to be high as they are supposed

to stick to a strict socially scientific procedure and employ all learning students as participants (Miller & Salkind, 2002). In other side, albeit both qualitative longitudinal study and expert-panel assessment are more qualitative in nature, they are also assumed to undergo an equal probability sampling method. So as replication in findings by these approaches will be still tenable (Singleton & Straits, 2010).

Conclusion

A conclusive remark is that researchers of OBL assessment would play the key role in determining the success and quality of results in the assessment, as they have the jurisdiction and need to judge, select and weld up findings collected from multiple methods to represent the actual outcomes of OBL in an institute finally. Therefore, personal dispositional quality of the researchers would also be representative of the quality of OBL results in sum. In addition, different research designs may have their own strengths and drawbacks, a researcher should be clearly knowledgeable about what outcomes are going to look into, plus what dimensional cognizance of these selected outcomes are essential. More than that, the temporal intervals of timing in collecting longitudinal data should be strictly planned and clung to as the process may severely have profound impacts on the analytic findings (Greene & Caracelli, 2005; Walliman, 2006). Last but not least, the coding methods in assessing qualitative data and the statistical procedures in analyzing quantitative data may lead to the qualities of outcomes of the final results, in which good rationales should be explored and justified for why and how a specific coding and statistical procedure be used before digging into the data.

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