On the "Assessment Morass" in Higher Education: A Program Level Perspective of Alignments and Tools

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ABSTRACT

A taxonomy of assessment types practiced in higher education institutions (HEIs) in general is briefly reviewed in this study, focusing on specific methods and tools commonly employed at the academic program level with student learning in mind. The work is aimed at complementing the efforts being currently exerted to initiate outcome-based education (OBE) environments in HEIs in the region by drawing attention to some issues that may be observed along the path of obtaining insight into achieving satisfactory results and providing suitable feedback. Suggestions are forwarded aiming at enhancing procedures being employed leading to improvements in various academic institutional and programmatic aspects which quality assurance (QA) and accreditation standards/criteria demand.

Keywords Assessment Types, Program Assessment, Self Assessment Report/Review (SAR), Academic Accreditation, Quality Assurance, Nawroz University

1. Introduction

With the current trend of adopting OBE methodologies in HEIs in the region, it is imperative that appropriate contributions be made that may complement those efforts by pointing out and suggesting various related ideas that could be required or be helpful along the path. In doing so, having a wider picture that includes the important issues involved in teaching and learning (T&L) processes would help in planning for an OBE environment, rather than deal with the different processes in isolation. One such issue is assessment which is an essential partner all along, with its various levels and methods.

In its narrowest usage, assessment may be taken as a synonym for 'measurement'. A more informed definition sees it as multidimensional having linkages between

- planning: specifying goals/objectives/outcomes

- measurement: gathering and analyzing data

- improvement: checking if the goals are being met and using the results to plan and improve.

It is with this latter approach that assessment is being considered here. With that view in mind, coupled with the types and methods that are commonly available and/or used, it is no wonder that the whole picture is sometimes described as "assessment morass" [1].

After glancing at the levels and types in such a *morass* (section 2), concentration is diverted mainly to aspects that are related to T&L at the program level, which would also cover certain course level features (section 3). Naturally, other levels and types completing the picture in a HEI, including assessment at institutional levels as well as the supporting and administrative units, are all equally important and should also be given due attention. After all, this full picture is what

institutional effectiveness (IE) is all about [15,17].

An effort is put into drawing attention to some concerns that may appear during the implementation of related processes. The last section (section 5) presents a number of suggestions followed by some recommendations that are thought to be relevant and useful for further consideration.

Appendices that are referred to in the sections and considered to be useful are provided, including a glossary that contains information on terms and concepts used.

2. A Taxonomy of Assessment Methods [1,2]

Given that assessment, in general, is related to and can answer important questions on almost all aspects of operations in a HEI, it is not surprising that many classification methods exist. Indeed, assessment is referred to under different headings and categories in different contexts. Examples of such categories that appear in the literature may look as follows:

a. **By level**: the following levels may be recognized within student learning domain

Level 1.   Assessing individual student learning within or across courses

Level 2.   Assessing courses, the extent to which a specific course is achieving its learning outcomes (Course LOs: CLOs)

Level 3.   Assessing programs, to determine if students are demonstrating the program LOs (PLOs)

Level 4.   Assessing the institution, to determine if the HEI is achieving its institutional learning objectives.

b. **By type**:
   o   qualitative and quantitative
   o   formative and summative
   o   reference-based and criterion-based
   o   direct and indirect
   o   local and external
   o   subjective and objective
   o   low stakes and high Stakes
   o   peer, portfolio, value-added, performance, embedded , ……

It is clear that with such a variety, the concentration on and precision in formulating the questions of interest would be essential and helpful to

   o   specify the level of analysis,
   o   determine the suitable methods,
   o   guide data gathering, interpretation, and use.

Indulging into the 'morass' with details and characteristics of the various methods and types is not the aim here. The literature is full of details and elaborations on the concepts involved. However, a brief glossary with a bias on student learning is compiled from various sources and presented in appendix II. Such a glossary may be helpful, given that agreed upon vocabularies on assessment in higher education may not be readily available [12].

3. Assessment at the Program Level

Assessment at the program level represents an important pillar in the overall IE and academic performance of a HEI, from both QA and accreditation standards viewpoints. It is closely linked with the attainment of a program's PLOs. Such a check constitutes one of the main instruments for a program assessment process.

Of course, program level assessment cannot be treated in complete isolation without the involvement of other levels. Alignment with issues at the course level, for example, are essential, since the attainment of PLOs is closely linked with and based on course learning outcomes (CLOs), in addition to other alignments [3,4]. It should therefore be expected to see course level aspects and tools to also feature at other levels.

3.1 QA and Academic Accreditation Standards

Various QA and accreditation standards and criteria emphasize the role of academic programs in the whole IE process. Two sources are used to illustrate ways of dealing with that role: the Standards & Guidelines for Quality Assurance in the European Higher Education Area (ESG) [10,11] and the Commission for Academic Accreditation (CAA) [6].

Both of these sources, as indeed all other related ones, clearly highlight the main requirements related to the matter at hand. The achievement of these requirements may be through various methods and tools, some of which are presented in the next subsections.

3.2 Assessment Methods [2,15]

Relevant requirements and methods are briefly listed below:

a. Specification of various related objectives and LOs with curriculum maps and alignment of the various components [3,16]

- o Program Educational Objectives (PEOs) with PLOs [16]: this alignment expresses the linkage between PLOs (attained upon graduation) and PEOs (expected to be attained by graduates within a few years of graduation [18].)

- o Courses and/or CLOs with PLOs: CAA standard 3.ii [6] states that "….. There is alignment of course/module learning outcomes and their assessment to the program learning outcomes, to demonstrate that achievement of program learning outcomes can be achieved and confirmed."

- o An alignment of courses with PLOs is illustrated in the matrix below, which may also indicate the degree of linkage in each cell, for example to indicate which courses are 'strongly' linked.

  Matrices of CLOs with PLOs for each course may also be considered [3].

Courses		PLOs					
Course #	**Course title**	**a**	**b**	**c**	**d**	**..**	**..**
CMSC215	Data structures	√			√		√
CMSC412	Computer Arch			√		√	
……	……..		√				√
……..	………	√		√			√

A sample of a mapping showing the alignment of CLOs of a given course with PLOs is shown in the course plan (CP) template in appendix Ia. Such a mapping may also be useful when considering the attainment of PLOs.

b. Utilization of scheduled direct and indirect methods

b.1 direct methods may include, but not limited to

- o **Course-embedded**: assignments/tests/exams based on courses and CLOs v PLOs mappings.

- o **Capstone courses**, including projects: may integrate knowledge, concepts & skills associated with the entire sequence of study in the program.

- o **Exit examinations**: program specific, locally designed. A program may develop its own such test for graduating students and use it as part of PLOs assessment, or adopt an externally designed such test.

- o **Standardized tests** on the national level: may be developed by a program area's professional association or testing agencies.

- o **Student papers and portfolios,** with rubrics.

b.2 Indirect methods

b2.1 Surveys: represent an important tool for various purposes in HE circles, especially assessments. Of the many commonly used types, some related ones are:

- o **exit surveys and interviews**: conducted during the last semester just before graduation. May include questions and/or opinions on the

program as a whole and the PLOs in particular. This survey is not to be confused with the commonly used one for course and teaching evaluations through students of all levels.

o **alumni surveys**: conducted two or three years after graduation, on a regular basis thereafter, may include questions and suggestions on attainment of PLOs and PEOs.

o **training/work placement surveys**: conducted after completing the training or work placement course. May include questions on PLOs.

o **employer surveys**: may include questions and suggestions on attainment of PLOs and PEOs.

o **faculty surveys**: may include questions and suggestions on PLOs , PEOs and the curriculum in general.

b2.2 Peer/external reviews: a widely used method.

b2.3 Curriculum and syllabus analysis: in accordance with relevant accreditation standards, international guidelines and benchmarks.

c. Implementation of internal and external QA processes, where the institution monitors and periodically reviews all programs, culminating with the preparation of program SARs [10]. These SARs are also required for academic accreditation processes. Examples of SAR structures/templates that are in compliance with accreditation standards may be found in the literature [19].

4. Auxiliary Tools

With the aims and targets concluded from the previous sections in mind, a number of tools are that may be considered supplementary or auxiliary are considered for the achievement of these targets. Emphasis on these tools is clearly referred to in both QA guidelines [10] and accreditation standards [6]:

a. Relevant documents: many documents related to the operation of HEIs are required, two such documents closely related to academic programs are the catalog and the QA manual:

- **Program, also called course, catalog** [8,9,14]**,** essential from the QA and accreditation points of view. "The Course Catalogue should include general information on the institution, its resources and services, as well as academic information on its programmes and individual educational components" [7].

- **QA (also called IE) manual,** a necessary document and tool to have in a HEI. It should specifically include detailed requirements of program level assessment, among others.[15]

b. CP and Course report (CR)/course file (CF): Two useful tools that are used at the course level [3], but have aspects related to programs. Possible templates showing the main structure for the two tools are shown in appendices Ia and Ib.

c. More matrices: two useful matrices or tables, that have been used by the author may be worth mentioning, are given below:

- **The first** links the final course grades/results with PLOs**:** based on the courses vs. PLOs matrix shown earlier by computing the overall average grade computed from courses appearing in each column, or only of courses 'strongly' linked, under each PLO which may then be utilized but only as a general indicator, since such a result would only be meaningful if it could be assumed that the each course involved was properly conducted and performed, at least as far as the attainment of its CLOs is concerned in the first place.

- **The second** matrix links each PLO with related indicators obtained from the analyses of the

various tools and surveys that may be considered to be linked with or related to each PLO, if only to give an overall picture.

5. Suggestions and Recommendations

The traditionally adopted trend in assessment, where most of the attention is often given to evaluation of the individual student performance at the course level, is often prevalent regardless of how well that evaluation and the accompanying T&L processes are performed, while other types and levels have not been receiving the attention they deserve. Assessment, in general and at all levels, has been receiving a raw deal in HEI processes over the years.

It may be worth noting that the concepts, tools and methods presented are independent of the scheme of credits adopted for curriculum components or courses, e.g. semester credits (CrHrs), ECTS credits [7], or any other.

Some related concerns and comments in the form of suggestions followed by recommendations are listed below:

5.1 Suggestions

- In light of the quotation *"we don't assess to prove, but to improve" [Daniel L. Stufflebeam]*, programs (as indeed other levels too) should not be assessed only with the aim of proving the attainment of certain goals, objectives and/or outcomes, but also to improve based on evidence obtained from the various tools, reports and results. A Deming cycle approach of 'Plan-Do-Check-Act' sequence ought to be adopted with improvements (Act) in mind.

- It would be more helpful when the full picture that includes all curriculum components, including assessment, with details is visualized and understood from the start of planning for the various processes related to curriculum/program design.

- A variety of tools and methods may be used in the assessment of learning at program level . PLOs are central to the process of program assessment. Each PLO may be linked with a different set of assessment methods, which may be used to check the attainment of that PLO. Using a combination of direct and indirect methods offers complementary information regarding such checks. These details may be expressed in tabular form, where the linkage of each PLO to its tools is clear.

- Program level assessment can only be meaningful when course level processes and assessments are appropriately in place.

- Challenges [13] that may be faced along the path must be acknowledged and dealt with properly. Papering over the cracks does not provide a cure.

- Attempting to tackle many or all of the issues presented in their totality from the start may be overwhelming for all concerned, given that most of the methods or tools presented may not currently be implemented in all HEIs in the region. A department or a program may arrive at a suitable mechanism for an implementation plan of processes in a scheduled and timely manner.

- The perspective presented will be better suited to program structures that are in compliance with accreditation standards, current trends and international guidelines[5].

5.2 Recommendations

a. The involvement of students, as the main stakeholders in the process, is essential. They have to be prepared with understanding and interest in the various requirements.

b. Assessment at various levels of a HEI ought to be better scrutinized and capacity building opportunities provided for all concerned.

c. Alignment between the various related activities and processes, without which the whole issue of OBE and related assessments will not be very meaningful, ought to be observed.

d. The systematic and regular monitoring, reviewing and evaluation of the effectiveness of all aspects of educational programs, and other operations, is a requirement of academic accreditation & QA standards. These issues ought to be given the attention they require.

e. As an essential target of program assessment and hopefully subsequent accreditation processes, plans for program SARs ought to be relevant to some corresponding accreditation standards. SARs cannot be done in a rush, the whole process is expected to need time.

6. Acknowledgement

Key concepts underpinning the issues presented in this work were identified from the literature. The aim of the study has been to draw the attention of HEIs in the area to the methods, tools and issues involved, regardless of how, or if, they are being implemented.

7. References

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Appendix I a : Course Plan Template

Course code & name: CMSC324 ………		Academic yr:
Course Prerequisite(s):		
Course Instructor/Teacher:		
Course Coordinator(s):	Responsible department	
Duration: 1 sem	When taught: *3rd yr*	Credit Hours: 3	Course hrs: *Th: 2 Pr: 2*

1	Course Aims:	2. Course Content : as in catalog.
3	Text Book(s):	4. References
5	Course Learning Outcomes (CLOs): At the end of this course the students should have the ability to: 1. Compare …... n. ……..	

6. Evaluation:

Activity	Assessment/marks	Dates/Remarks
Test 1	...	
Mid-term exam	20	
Assignment, prohect……..	……	
Final-term exam	40	
Total	100	

7. Descriptions of Projects and Assignments:

  Suitable assignment(s) will be given to the students during the course.

8. Alignment Matrix of PLOs with CLOs   9. Course Schedule/contents and CLOs Matrix

PLOs		CLOs			
No.	PLOs	*1*	*2*	*3*	*…*
a		√			√
….			√	√	
…..		√			

Course contents		CLOs			
week	Topics	*1*	*2*	*3*	*…*
1		√			√
…..			√	√	
15		√			

Appendix I b :   Course Report Template

Course Code	
Course Name	
Semester/Academic year	
Instructor's Name	

Students:

#	CATEGORY	NUMOF STUDENTS
1	Number of students who took the Final Examination	
2	Number of students who postponed the Final Exam	
3	Number of students who failed in Final Examination	
	Total number of students registered in this course	

Distribution of Marks with Statistical Chart (exam committee provide data):

	>=90	89-80	79-70	69-60	59-50	<50	Mean Mark
# (or%) of Students							

The Statistical Chart
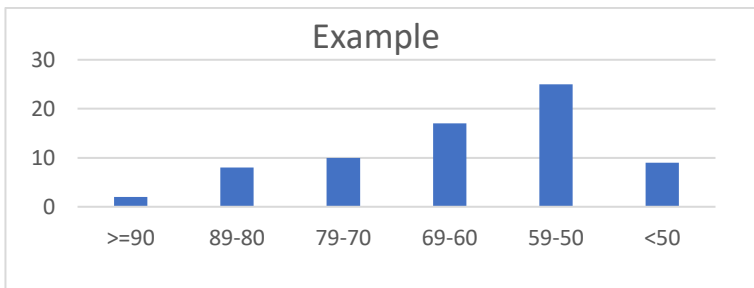
A. Course Contents:

Course Contents		MATERIAL	Coverage
Week	Topics		
1	….	Textbook (Ch1)	Covered
…..	….	Ref2 (Ch2)	Partial
15	….		Not covered

Degree of coverage: <u>partially covered</u> (less than 65% of the material),   or   <u>not covered</u>

For partially covered and not covered please write your justification below:

Instructor Remarks

B. Assignments and Exams:

a) Copies of graded assignments MUST be attached.

b) Copies of all quizzes, tests, mid-term, and the Final Exam with standard solutions MUST be attached.

		Assigned Maximum Mark	Class Average	Remarks
	…….	10		
	Mid-term exam	20		
	………	…		
	……	…		
	Final-term exam	40		
	Total	100		

C. Synopsis of Students' Remarks (Based on Course & Teaching Evaluation Survey):

Student evaluation of the course (Attach survey results report)
List the most important recommendations for improvement and strengths

D. Course learning outcome assessment.:

#	List course learning outcomes	List methods of assessment	Summary analysis of assessment
1			
..			
4			

E. IT, Online, & Other Teaching Resources Used: (IT used in teaching, overall evaluation of IT resources, Notes and suggestions for future development).

F. Instructor's General Remarks:

G. Recommendations for Improvement:

Progress on actions proposed for improving the course in previous course reports (if any).			
Actions recommended from the most recent	Actions Taken	Results	Remarks

CRs			
a.			
……..			
d.			

H. Summary of any actions recommended for improving teaching strategies as a result of evaluations in table F.

Name of Course Instructor: _____

 Signature: _____ Date Report Completed: _____

Reviewed by Program Director/HoD:

………

Name: …………………………………………

Signature: _____ Date Received: _____

Appendix II   Glossary

[compiled from various sources]

Assessment: any effort to gather, analyze, and interpret evidence.

Capstone Assessment: assessment of outcomes structured into learning experiences occurring at the end of a program. The experiences involve demonstration of a comprehensive range of program outcomes through some type of product or performance.

CLO: course learning outcome, a statement of what learners are expected to be able to do on successful completion of a course in order to demonstrate their knowledge, understanding, skills and/or competences.

Course/Program Catalog: includes general information on the institution, its resources and services, as well as academic information on its programs & individual educational components.

Credit hour CrHr, also called semester hour: one-hour lecture, or two/three-hour laboratory, over a 15-week semester (excluding assessments) are regarded as one CrHr.

Criterion-referenced assessment: performances are judged against pre-set criteria as specified in the intended learning outcomes. It informs teachers how well the intended learning outcomes have been achieved.

Curriculum Maps: are matrices that document the alignment of course student learning outcomes to program student learning outcomes and institutional general education outcomes. These matrices provide evidence that students have an opportunity to learn program student learning outcomes and institutional general education competencies throughout the curriculum. The process of creating them helps faculty to identify gaps in the curriculum. They also help faculty to design assessments.

Deming Cycle: *Plan, Do, Check (Study) and Act.* PDCA Cycle (also known as PDSA Cycle), is a continuous quality improvement model consisting out of a logical sequence of four repetitive steps for continuous improvement and learning. Also known as the the Deming wheel of continuous improvement spiral.

Direct Methods: any process employed to gather data that requires students to display their knowledge, behavior, or thought processes.

Embedded Assessment: related to program assessment, this refers to double-dipping, i.e. assessment of student artifacts for both course assessment as well as program assessment. A means of gathering assessment data that is built-in to an existing course or program.

Formative Assessment: conducted during a performance/course/program with the purpose of providing feedback that can be used to modify, shape, and improve a performance/course/program.

High Stakes Assessment: any assessment whose results have important consequences for students, teachers, programs, etc. For example, using results of assessment to determine whether a student should receive certification, graduate, or move on to the next level. Most often the instrument is externally developed, based on set standards, carried out in a secure testing situation, and administered at a single point in time.

Indirect Methods: any process employed to gather data that asks students to reflect upon their knowledge, behaviors, or thought processes.

Institutional effectiveness: documented process of measuring how well an institution is achieving its mission and addressing its strategic plan for the purpose of continuous improvement of student learning, student development, and administrative unit operations.

Low Stakes Assessment: are forms of evaluation that do not heavily impact students' final grades or other educational outcomes. The purpose of low-stakes assessments is to provide students with an indication of their performance while taking a course and give students an opportunity to improve their performance prior to receiving a final grade, either on an assignment or in a course.

Norm-referenced assessment: compares students with others. Students are assigned grades according to their standing relative to other students. Grades are commonly allocated in quotas that follow the normal curve (grading on the curve). NRA does not however say anything about the standard of students' performances, only about which students are better than others.

OBE: a method of curriculum design and teaching that focuses on what students gained and can actually do after they are taught.

PEO: program educational objective, a broad statement that describes what graduates are expected to attain within a few years of graduation.PEOs are based on the needs of the program's constituencies. (ABET)

PLO: program learning outcome, is a statement of what learners are expected to know, understand or be able to do on successful completion of the entire program.

Qualitative Assessment: collects data that does not lend itself to quantitative methods but rather to interpretive criteria. example, interviews, focus groups, antidotal evidence.

Quantitative Assessment: collects data that can be analyzed using quantitative methods.

Peer: in the context of quality in higher education, is a person who understands the context in which a quality review is being undertaken and is able to contribute to the process.

Peer assessment: assessment of the work of others by people of equal status and power.

Peer review: is the process of evaluating the provision, work process, or output of an individual or collective

operating in the same milieu as the reviewer(s).

PEO: program educational objective, a broad statement that describes what graduates are expected to attain within a few years of graduation. PEOs are based on the needs of the program's constituencies. (ABET definition)

PLO: program learning outcome, is a statement of what learners are expected to know, understand or be able to do on successful completion of the entire program.

Portfolio Assessment: a type of direct measure, a performance measure, in which students' assignments are carefully reviewed for evidence of desired learning outcomes.

Qualitative assessment: measures that collect non-numerical data, such as interviews or short-answer questions.

Quantitative assessment: measures that collect numerical data that can be analyzed statistically.

Rubrics: a set of categories used to evaluate the important components of the work being assessed. Each category consists of levels of competence with a score to be assigned to each level and a clear description of what criteria must be met to attain each score.

SAR: self assessment report, a quantitative and qualitative assessment of the strengths and limitations of the program being submitted for review. It provides information critical to a thorough review of the program. A SAR will address the extent to which the program meets its mission, objectives, and certain criteria. In so doing, it is necessary that the report address all methods of instructional delivery used for the program and all possible paths that students may take to completion of the degree.

Stakeholder: anyone with a vested interest in the outcome of a program (such as faculty, students, administration, community members, employers, alumni, and governing bodies).

Summative Assessment: done at the conclusion of a course or some larger instructional period (e.g., at the end of the program). The purpose is to determine success or to what extent the program/project/course met its goals.

Work placement: a planned period of experience outside the institution (e.g., in a workplace) to help students to develop particular skills, knowledge or understanding as part of their program.