Design of Novel Outcome Based Assessment Tools to Improvise Higher Education Academic Standards and its Quality

Dr. Subadra Murugan and Queen Rayappan

*Einstein College of Engineering, Tirunelveli-627 012, Tamilnadu, India.*

Abstract

Assessment is an on-going process that involves collection of information about the skill set of the students and uses this information to modify & improve the outcomes of the students thereby enhancing the quality education. To substantiate the achievement of course objectives and Program educational objectives, it is necessary to create assessment instruments or tools that assure the attainment of identified skills of the students. Developing assessment instruments are an important element in evaluating new innovation as well as existing educational systems. The outcome assessment tools are broadly classified as Direct and Indirect measures for preserving academic standards.

This paper reviews about different types of assessment methods which help in ensuring quality education. It also proposes new instruments of assessment for improvising academic standards and quality in higher education. Different types of assessment and evaluation procedures such as baseline, alternate, authentic, formative, ongoing, general, summative and overall assessment methods are discussed considering four key areas such as content, learning opportunities, learning outcomes and assessments.

Key Words: Quality Outcome Assessment, Peer team assessment, Assessment techniques, Educational Objectives

1. Introduction

The goals of education is to impart critical thinking, effective communication, social responsibilities, literacy, scientific and technological competence in a human being by improving their cognitive, affective and behavioral skills through knowledge acquiring, comprehension, application, analysis, synthesis and evaluation. In order to achieve the goals of education, the outputs of educational system need to be analysed that provides systematic evidence of individual program, departmental, and institution. This is to serve specific and inter related purposes as

① To provide feedback to the students on their learning thereby enhancing their performance

② To evaluate the effectiveness of teaching and to improve the strategies of teaching

③ To document best practices and to identify the opportunity for further improvement

④ To provide evidence for institutional effectiveness
The institutional effectiveness depends on the process of accomplishing its mission which is measured by the efficiency of outcome assessment in terms of academic, research and the support of stakeholders of that institution. Conventionally, the education in an institution was based on status quo, external focus, top down communication, attainment of results, compliance, utilising standardised methods and analysing by peer view to emphasise on quality. This was the method of evaluation. Now-a-days to improvise the academic standards, the institution aims at excellence by moving towards continuous improvement, internal focus, two way communication, development of new skill set, commitment, utilising local methods and self monitoring analysis. This is the method of assessment.

Assessment differs from evaluation. Assessment focuses on assessing student learning and experience to determine whether student have acquired the skills, knowledge and competency associated with their program of studies. It is the analysis that uses the data of the students, faculty and department to make decision about the improvement in teaching and learning methods. However evaluation is the analysis that uses the data by the faculty to make judgement about the students’ performance. For example in an assessment the faculty member provides feedback to a student regarding the performance on the results of examination. The student uses this feedback to study differently in order to improve learning where as in evaluation, a faculty member just corrects the test paper and assigns grade to a student. Similarly in an assessment if the class attendance record indicates that a student has been absent multiple times, the faculty member advises the student in order to facilitate improved attendance, as studies suggest that regular class attendance contributes to student success. Where as, in an evaluation, points are deducted from a student’s grade for each class absence in accordance with department policy. Thus assessment plays an important role in institutional effectiveness than mere evaluation to emphasise on quality education.

2. Quality Assessment of Programme

Quality Assessment of Programme is intended to help institutions to evaluate and to improve the quality of their process of education thereby meeting their educational objectives. Assessment is the systematic collection and analysis of information to improve student learning. Through assessment one can know about the knowledge and skills a student have as they entered a course. It can provide reliable data and student learning information from student’s evaluation. It can make data about effects of curriculum or teaching methods. It can also provide evidence that faculty members make a difference in a student learning. Programme assessment can offer a larger view of students’ needs and accomplishment. It rest largely in the hands of the faculty as they fix the learning objectives and outcomes.

Good learning outcomes are learner centred which focus on what students can do instead of effort put into teaching them. It will be the key to course objective and meaningful for faculty and student. It should always be measurable. Thus, program outcome assessment is a process where the main goals are articulated to check whether the students have achieved them and then to use the results to make the courses better. In other words to analyse whether the organisation is making a difference in the life of an individual it serves. The outcome assessments have three stages:
1. Defining the goals for the student to achieve as a result of participating in an academic experience through vision, mission, educational objectives

2. Analysing how well the students perform to achieve the goals

3. Using the results and feedback to improve academic experience

Figure 1 shows the flowchart of quality assessment of programme which verifies the program or leaning outcomes.

3. Principles of assessment

The outcome assessment has to be done in a systematic way so as to excel the academic standard by creating a culture in which institutional effectiveness and student learning are highly appreciated to have quality of education. There are certain principles of assessment as follows:

1. The assessment of student learning begins with educational values.
2. Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed in performance over time.

3. Assessment works best when the programs it seeks to improve have clear, explicitly stated purposes.

4. Assessment requires attention to outcomes but also and equally to the experiences that lead to those outcomes.

5. Assessment works best when it is ongoing, not episodic.

6. Assessment fosters wider improvement when representatives from across the educational community are involved.

7. Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.

8. Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change.

9. Through assessment, educators meet responsibilities to students and to the public.

4. Assessment methods and Instruments

The assessment should be systematic integral part of department, ongoing, cumulative, multi-faceted and realistic that is achieved through methods and instruments. Assessments can be direct or indirect. Assessment method is the general type of tool that is used to assess students learning outcome. The instrument is what is used to complete the assessment. It is designed and implemented by the stake holders mainly by faculty. The general assessment process of a student from entry to exit level in engineering colleges in Tamil Nadu under Anna University, Chennai is shown by the table (No. 1 to 4).

Table No.1 Assessment Admission

<table>
<thead>
<tr>
<th>Key Assessment</th>
<th>Assessment Process</th>
<th>Options for Students</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through Counseling</td>
<td>First Year - XII Std. Marks</td>
<td>Cut Off Marks</td>
<td>AICTE, Anna University</td>
</tr>
<tr>
<td></td>
<td>Lateral Entry - V &amp; VI Semester Mark Sheet (Diploma)</td>
<td></td>
<td>Chennai, Management</td>
</tr>
<tr>
<td></td>
<td>B.Sc. with Ancillary Mathematics</td>
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<td></td>
</tr>
</tbody>
</table>
Table No.2 Assessment during degree candidacy

<table>
<thead>
<tr>
<th>Key Assessment</th>
<th>Assessment Process</th>
<th>Options for Students</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>By Course Plan</td>
<td>Course Instructor Assessments and Analysis Review by Programme Coordinator</td>
<td>Remedial Class, Retest Counseling by Faculty</td>
<td>Course Instructor, Course Coordinator, Programme Coordinator, Class Advisors and Tutors</td>
</tr>
<tr>
<td>Minimum GPA in Graduate Courses</td>
<td>Transcript Analysis by examiners of Anna University, Chennai</td>
<td>May repeat the course as arrear examination</td>
<td>Anna University Chennai</td>
</tr>
<tr>
<td>Performance in Laboratory and Mini projects</td>
<td>Field Evaluation</td>
<td>Repeat the course as arrear examination, Revaluation</td>
<td>Project Guide, Course Coordinator and Programme Coordinator</td>
</tr>
<tr>
<td>Feedback</td>
<td>Survey, Tutor Meeting (weekly), Class Committee Meeting (CCM) (Twice every semester)</td>
<td>Discuss and get guidance from faculty</td>
<td>Course Instructor, Class Advisor, Course Coordinator, Class Committee Meeting Chair Person</td>
</tr>
</tbody>
</table>

Table No.3 Assessment during Programme Exit

<table>
<thead>
<tr>
<th>Key Assessment</th>
<th>Assessment Process</th>
<th>Options for Students</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful Completion of Project</td>
<td>Demonstration Evaluation by Project Guide and University External Examiner</td>
<td>May repeat the course as arrear examination</td>
<td>Programme Coordinator</td>
</tr>
<tr>
<td>Feedback</td>
<td>Graduate Exit Survey (Once a year)</td>
<td>Suggest improvements and identify technical gaps</td>
<td>Faculty of the College contributing to ECE programme</td>
</tr>
</tbody>
</table>

Table No.4 Assessment after exit

<table>
<thead>
<tr>
<th>Key Assessment</th>
<th>Assessment Process</th>
<th>Options for Students</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback from Alumni</td>
<td>Alumni Survey (Regularly)</td>
<td>Suggest Improvements and identify technical gaps</td>
<td>Programme Coordinator, Quality Assurance Cell and Department Advisory Committee</td>
</tr>
<tr>
<td>Feedback from Employers</td>
<td>Employer Survey (Regularly)</td>
<td>Suggest Improvements and identify technical gaps</td>
<td>Programme Coordinator, Quality Assurance Cell and Department Advisory Committee</td>
</tr>
</tbody>
</table>
The most effective assessment plan is the one that is closely linked to the curriculum and uses available information and resources to the greatest degree possible. The key part of designing and types of assessment methods to use is knowing about what is necessary to assess in terms of student learning, student attitude, perception and departmental process. When developing the assessment method the selection should answer the questions that are important to meet the objective, should be manageable with in the available resource, should result in useful feedback that highlights accomplishment and identifies area requiring attention. The different types of assessment are as follows:

4.1 Baseline Assessment

Baseline assessment is a standardised method used to assess a student’s abilities and skills when entering the course in terms of social status, economic status and cultural status of the student from their portfolios. It enables the staff to identify the student potential and helps them to plan lessons and measure progress. It also covers the marks obtained in their entrance examination and their proficiency in mathematics, language and science. The student personal and social development is also monitored.

4.2 Alternate Assessment

This assessment focuses on students' deeper understanding of the subject and ability to generalize and interpret its content. This type of evaluation can be noted through test using multiple choice questions, one word answer, short questions, short notes, essay type and problem solving, quiz etc.,

4.3 Authentic Assessment

Simply testing an isolated skill or a retained fact does not effectively measure a student's capabilities. To accurately evaluate what a student has learned, an assessment method must examine his or her collective abilities. The term authentic assessment describes the multiple forms of assessment that reflect student learning, achievement, motivation, and attitudes on instructionally relevant activities such as design or innovation of technical content through mini project demonstrations, presentations (oral or visual) and participation in co-curricular activities such as symposium, conferences, workshop, technical exhibitions etc.

4.4 Formative Assessment

Formative assessment is defined as “information communicated to the learner that is intended to modify his or her thinking or behavior for the purpose of improving learning”. It is part of a feedback process in which a learner is able to evaluate their response in light of the information received, and make adjustments. It can be used to identify gaps in knowledge, help beginner learners to identify important information, correct procedural errors or misconceptions. Feedback generated through formative assessment can also be used to improve teaching learning process. This assessment is analysed using feedbacks obtained from students and from other stake holders during parent teachers meeting, class committee meeting, team building meeting, graduate exit survey, employee survey etc.,
4.5 Ongoing Assessment

Assessment that fosters understanding (rather than simply evaluating it) has to be more than an end-of-the-unit test. It needs to inform students and teachers about both what students currently understand and how to proceed with subsequent teaching and learning. It includes periodic assessment, attendance, performance during mid-term test, after coaching class etc.; In lab classes performance can be analysed by design, observation, viva and regularity.

4.6 Self-assessment

The process of evaluating or reflecting on one’s own learning and development. This can be evaluated from the seminars given by the student after self study and by the assignment.

4.7 Summative Assessment

This assessment aims at understanding and improving learning, understanding, or performance at the completion of program activities. It involves gathering and interpreting evidence of performance at the end of a program and is used to help make decisions about program continuation, termination, expansion or adoption in terms of percentage of pass, grade obtained by the students etc.;

5. Conventional Classroom Assessment Techniques

Out of different types of assessments, the ongoing and alternative assessment place a vital role as it continuously check the ability of understanding and the performance of the students towards the course objectives. These two assessments mainly depend upon classroom assessment techniques. This section briefly discuss about the effective methods that help the faculties to evaluate the learning outcomes inside the class room. The different categories of classroom techniques are assessing course related knowledge & skills, assessing learner attitudes, value & self awareness and assessing learner reactions to instructions.

5.1 Assessing course related knowledge & skills

In this category, the students’ prior knowledge, recall and understanding abilities are assessed by the techniques such as minute paper, muddiest point, back ground knowledge probe, focused listing, preconception check, empty outlines, memory matrix etc. The analysis and critical thinking skills are assessed by the techniques like defining feature matrix, pro & con grid, categorizing grid, analytic memo, content form & function outline techniques etc. For assessing the skill in synthesis and creative thinking the tools like one sentence summary, word journal, concept map, invented dialogues, annotated portfolio and approximate analogies are used. For assessing the skill in problem solving, tools like problem recognition task, principles, audio video taped protocol and documented problem solution are used. The skill in application and performance are determined using directed para phrasing, student generated test question, human tableau or class modeling, paper or prospectus and application cards methods.
5.2 Assessing learner attitudes, value and self awareness

For assessing students’ awareness of their attitudes and values techniques like class room opinion polls, goal ranking & matching, every day ethical dilemma, profiles of admiral individuals and course related self confidence surveys are used. For assessing students’ self awareness as learners’ procedures like focused auto biographical sketches, interest / knowledge / skills checklist and self assessment of ways of learning are followed. The study skills, learning strategy and behaviors of the students can be assessed by punctuated lectures, productive study time log, process analysis, diagnostic learning loss.

5.3 Assessing learner reactions to instructions

Chain nodes, group work evaluation, teacher designed feedback, group instructional feedback, class room assessment quality circle and email feedback are used to assess learners reaction towards teachers and teaching. Similarly, reading rating sheets and exam evaluation are used to assess the learners’ reaction to class activity, assignments and materials.

6. Peer Team Tutoring - An Novel outcome based assessment method

Learning is not a spectator sport. Just by sitting inside the class and listening to teachers, the student will not learn enough. They must talk about what they are learning, write about it and apply it to what they feel is important. They must make what they learn a part of themselves. One effective method to provide this kind of environment is learning by teaching. Students learn more and demonstrate mastery when they are able to comprehensively teach a subject. Similarly, when a student is struggling, having someone who is on the same age level as them can help to create bridges in the learning gaps.

In this technique, the bright students in the class are identified and the remaining students of the class are divided into small n number of groups where each group is headed by one of the bright student. The important topic which can be self learned that are identified by the faculty is given to the team head. The team head will act as teacher and will teach, monitor and evaluate the fellow students. This technique can positively affect the student role as leader and also motivates them which in turn increases student satisfaction and involvement. This method especially has positive impact on low achievers that they can improve in their performance and grasping time can be reduced. It will also facilitate the ability of critical thinking of the poor learners. The staff can finally evaluate by any other evaluation technique. This method will definitely provide useful information about student learning with a much lower investment of time as compared to other traditional means of learning assessments.

7. Strategies

The progress of learning outcomes should exploit the depth of knowledge from the faculty and thereby helping to shape the nature & direction and there by improvement of the program. The strategic plan for the student outcome assessment includes create goals for student outcomes & processes, indentifying and collecting data, analysis and interpretation,
identify suitable assessment methods, set timeline & target to achieve the planned objectives, implement assessment plan, develop a system to document the results. For each degree plan or program, faculty establish outcomes—statements that identify what students should be able to do or demonstrate as a result of their studies—gather information to measure the extent to which students achieve the outcomes, and then use the results to make changes in curriculum. Once the outcomes are obtained it is mapped with course objectives.

8. Conclusion

In this paper the quality assessment of programme is discussed in detail with different type of assessment methods and techniques. Novel assessment technique is proposed as “Peer Team Tutoring” which can help the student to develop self-assessment and managerial skills. It also reduces the feeling of isolation especially in large classes. It fosters the attitude of understanding, interest and long term relationship with their classmates.

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