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Influence of Activity based Assessment in Outcome-based Education

C. M. Vivek[1], G. Thamilvanan[2], K. Mohanasundaram[3]
[1] *Assistant Professor in Department of Mechanical engineering,*
Periyar Maniammai Institute of Science and Technology (Deemed to be Universit), Thanjavur, India,
E-mail: vivekintense@gmail.com
[2] *Assistant Professor in Department of Education,*
Periyar Maniammai Institute of Science and Technology (Deemed to be Universit), Thanjavur, India,
E-mail: mgthamilvanan@gmail.com
[3] *Professor in Department of Education,*
Periyar Maniammai Institute of Science and Technology (Deemed to be Universit), Thanjavur, India,
E-mail:kmsedn@pmu.edu

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Abstract

Abstract— To produce dynamic and creative graduates Outcome-based education (OBE) was introduced. OBE focuses on the program outcomes (PO) such as knowledge of current technical issues, lifelong learning and responsibility & ethics to the profession. Activity based learning plays a major role in improving the course outcome attainment (CO) of the students. The study aimed to explore the influence of activity based assessment on student's learning outcomes. The sample consists of 52 students of undergraduate engineering course, with activity based components. The data were analyzed using descriptive analysis. The study reveals that the activity based assessment influences and enhances the course outcome attainment in outcome based education.

Keywords: *Outcome-based education, Activity based assessment, Course outcomes, Formative assessment, Summative assessment, Evaluation pattern, Higher education.*

1 INTRODUCTION

Outcome based education (OBE) focus on organizing and measuring the outcomes which are essential for assessing the student. For this, a set of learning outcomes with conditions are to be provided. In the OBE system, the framework is based on measuring the outcomes in terms of the program and course which the student is enrolled. The program outcome (PO) is the expected outcome of students in completing the entire program, where Course outcome (CO) is the expected outcome at the end of the course. [1] The framework establishes educational domains into three categories Cognitive, Psychomotor, and affective domain. Each of these domains has various levels and level of assessment is based on these domains and levels. [2] As the student's degree is a sum of their single grades, they do not target on the deep understanding, but on successful examinations. The examination and questioning part for students in multiple-choice and theoretical perspective mainly focus on basic facts on the topic and neglect the global network and topic interdependencies. [3]

In the current era, the education system has the uphill task of preparing the learners for moving up to higher education and jobs. With innovations and

technological advancements, learners require skill and knowledge to sustain in careers. Most of the educational institutions have the challenge of implementing sustainability to prepare the stakeholders of the future. Expectations from product manufacturers are to deliver high-quality products to the customers. Hence, they look for the right people for carrying out activities in their organization. Education for sustainable development requires affective attributes such as values, attitudes, dispositions and sustainable attributes such as knowledge, skills, competencies, etc. Sustainable development is possible if only there is a change in affective behavior. Higher-order affective changes relate to behavioral changes. [4]

Work-based learning (WBL) has challenges towards the assessment modes. However, it provides the opportunity to manage the quality of traditionally taught course by providing challenges. [5] With the variety of resources available in different modes for the learners which result in the superficial learning process. The overall outcome of this is learners inability to understand, apply the topics they learner. For educational effectiveness grading policy are criteria-based. However, for differentiating criteria and standard, criteria refer to overlap of required quality level. Primary focus on standards and making criteria secondary leads to substantial progress. [6] Using a standards-based assessment improves the teaching and learning process. [7]

Assessment type plays a major role in determining the quality of the students and measuring the outcomes. The outcome may differ based on the teaching method of the instructor in the classroom. Lectures, tutorials, practical's, self-study are some common method adopted in teaching. This paper focuses on the assessment provided during the course and their influence on the course outcome of the final examinations.

2 METHODS

Survey method is used for collecting and analyzing the data. The sample consists of 52 undergraduate students studying engineering and technology in Periyar Maniammai Institute of Science and Technology (PMIST).

3 COURSE OUTLINE

The investigation is carried out in the course having formative assessment (during course) and summative assessment (at the end of course). Both formative assessment (FA) and summative assessments (SA) are given equal weightage of 50% each. Totally five course outcomes (CO) are articulated for completion of the course. For successful completion of course, the student has to meet the criteria in formative and summative assessments. The FA consist of continuous assessment 1 (CA1), continuous assessment 2 (CA2) and continuous assessment 3 (CA3). Out of this CA1 and CA2 are written exams and CA3 consist of five components. These five CA3 components CA3.1, CA3.2, CA3.3 and CA3.4 are mapped with CO1, CO2, CO3 and CO4.

CA1 written exams are completed after CA3.1 and CA3.2, CA2 written exams are completed after CA3.3 and CA3.4. The influence of CA3 are measured in the CA1 and CA2 in terms of course outcome attainment (CO attainment %). The weightage of the course is shown in fig.1. For calculating the CO attainment the following formulas are used.

Average = Total score by x number of students attempted this question out of total 'n' students / x number of students attempted this question out of total 'n' students

Percentage = Percentage of students attempted this question

% Attainment = (Average mark / Max Marks) for each question by attempted students

Act Attainment = Actual Attainment (Considering all the students)

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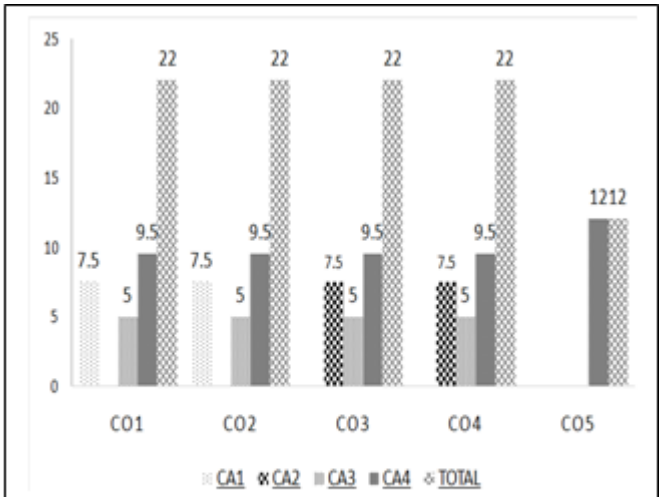

Fig.1. DISTRIBUTION OF WEIGHTAGE – COURSE OUTCOME AND ASSESMENT

4 ASSESSMENT OF COURSE OUTCOMES

4.1 Continuous Assessment 1 (CA1)

CA1 is written exam held for 50 marks with weightage of 15 %. The CA1 is related to CO1 and CO2 having equal weightage of 7.5 % each.

4.2 Continuous Assessment 2 (CA2)

CA2 is written exam held for 50 marks with weightage of 15 %. The CA2 is related to CO3 and CO3 having equal weightage of 7.5 % each.

4.3 Continuous Assessment 3 (CA3)

CA3.1 Assignment

This assessment requires students to collect data from books, journals, websites etc. This assessment is related to CO1 and requires only reproduction of data and lacks originality.

CA3.2 Seminar

Students collect data from book, journals, website etc and presenting the same in classroom. It reveals the creativity and personality of students.

CA3.3 Poster Presentation

In this method the student are assigned to prepare a poster with minimum description. Students will display the poster and explain the content to the peer. The poster will be evaluated by the course teacher.

CA3.4 Model making

Based on the classroom instruction of the course teacher the students will prepare a model on atopic and demonstrate in the classroom. It will be evaluated by the course teacher.

4.4 Continuous Assessment 4 (CA4)

CA4 is the summative written exam conducted after the completion of course. The exam is held for 100 marks and 50% of weightage is taken into account

TABLE 1
CA-3 ASSESMENT

CA3	COMPONENT	ASSESMENT TYPE	RELATION TO CO
CA3.1	ASSIGNMENT	CONVENTIONAL	CO1
CA3.2	SEMINAR	CONVENTIONAL	CO2
CA3.3	POSTER PRESENTATION	ACTIVITY BASED	CO3
CA3.4	MODEL MAKING	ACTIVITY	CO4

5 ANALYSIS

In CA1 written exam the CO attainment for CO1 is 52.6 % and CO2 is 56.47%. The CA1 written exam is scheduled after the competition of CA3.1 and CA3.2 assessments. In CA2 written exam the CO attainment % for CO3 is 78.64 and CO4 is 78.64%. The CA2 written exam is scheduled after the completion of CA3.3 and CA3.4. The CO attainment % for formative assessment is tabulated and shown in table.no.2

In summative written exam, the CO attainment is tabulated and shown in table.no.3. Maximum attainment of 76.31 % is obtained in CO where CA3 assessment imposed was model making-activity based assessment. Next to this CO3 has a CO attainment % of 72.42 which is also an activity based assessment – poster presentation.

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TABLE 2

CO ATTAINMENT % - FORMATIVE WRITTEN EXAM

FA WRITTEN EXAM	CO 1	CO2	CO3	CO4
CA1	52.36	56.47		
CA2			78.68	80.64

TABLE 3

CO ATTAINMENT %– CA4 SUMMATIVE

SA WRITTEN EXAM	CO1	CO2	CO3	CO4	CO5
	49.44	50.63	72.42	76.31	45.35

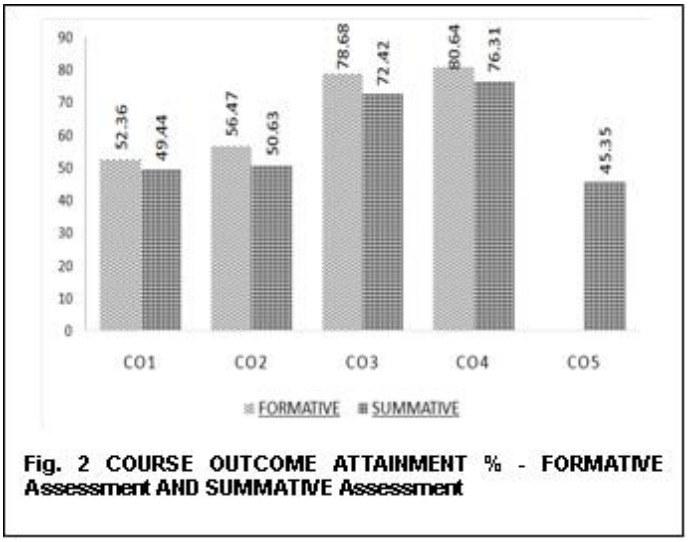

Fig. 2 COURSE OUTCOME ATTAINMENT % - FORMATIVE Assessment AND SUMMATIVE Assessment

6 RESULTS

By analyzing the CO attainment % of the FA and SA, we can conclude that the activity based assessments has positive influence over the written examinations comparing to the conventional assessments. Conventional assessment CA3.1 – Assignment has a minimal influence in course outcome attainment %.Assignment CA3.1 – Assignment requires mere reproduction of data's which are available to them. In addition to that, the blooms taxonomy level for cognitive domain requires basic remembering level only. Hence the graduates are not capable of delivering in effective manner due to lack of higher cognitive learning levels.

In CA3.3 and CA3.4 the assessments are activity based. For instance CA3.4 – model making assessment requires students to understand the various dynamics of the model they are going to prepare. For making a working model, the bloom taxonomy level for cognitive level reaches create, analyze. Hence students are capable of delivering an effective presentation in written exams comparing to conventional assessment.

7 CONCLUSION

As they stand, the activity-based assessment positively influences the CO attainment % in the written exams. Previous studies on gaming elements on summative assessments and innovating teaching with ICT tools also provided better results compared to conventional methods. However, the concept of graduating/ passing the course is secondary than the concept of understanding and implementing them in day to day activities. Outcome-based education provides the opportunity for measuring the course outcomes. Activity-based learning bridges the gap between the learner's theoretical knowledge and the parts of their application. By this activity-based assessment, students' level of cognitive goes beyond understanding.

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