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Implementation of Activity Based Continuous (ABC) Evaluation Strategies for PSOs Attainment

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Abstract **- The approaches used for assessment and instruction are powerful indicators of learning that is valued in the field of education. They are the fundamental activities in the educational process, specifically when related to designing and science. A few educational cycles, such as workforce progress, understudy scores, position, and deep insight, are impacted by ordinary content delivery and subpar evaluation. The Specific Outcomes of the Program (PSOs) and Course Outcomes are primarily managed by these two difficulties (COs). Examining the effects of movement-based learning and assessment methodologies to complete the assigned PSOs and COs through group or individual learning is the focus of the current work. The impact size of Hattie, which affects the success of the programme and course, has been examined. Two courses that were offered to a small group of college students studying electrical engineering showed the cycle. The measurements have been made based on the impact that each impact, element, and issue have on the size of the impact. The conversation also discusses the possibility of integrating action-based learning into Indian design education.**

Keywords **- COs, Group learning, Individual learning**

I. INTRODUCTION

Designing is the area where inventions, improvements, and applications of technologies and frameworks come together. Creating links between natural and human sciences to advance civilization. Due to India's rapid modernization, designing schools has been a popular career choice in the past twenty years. After graduation, the field also offers a variety of career paths. Concerns about design education have also sparked debate about advanced learning and evolving design education in various parts of the world (Lpez Pernas, S., Godillo, A., & Quemada, J., 2019). However, learning about India's design education is important given that it is arguably the fastest-growing agricultural country in modern times. The advancements anticipated in designing education been suggested to increase seriousness and effectiveness. Given everything said above, it is critical to complete the instruction's goal and prepare the frameworks (Adodo, 2013). An effort was made to alter the judgment when creating training. However, using teaching, learning, and assessment strategies has not produced any results. Understudies must be taught through a thorough understanding of creating scientifically accurate learning activities and developmental evaluation. Because these courses were taught by the instructor, it is much easier to complete PSOs for the B.Tech. (Electrical Engineering) programme and COs for EE305 Power Electronics and EE307 Solid State Drives. Since this activity is moderately intensive, it has been predicted that PSOs will experience the effects of noticeable learning before POs do. These two problems offer newcomers insights on how to make better-coordinated decisions to increase the effectiveness of students and programme output (Aithal, 2015).

In the review, efforts have been made to promote movement-based learning and assessment in order to satisfy the course's PSOs and COs. Regarding the distinguishable learning strategies, Cohen's D impact size, the source of influence on the learning and achievement of the understudy, component, and issue are included. The effect size is a precise way to distinguish between two gatherings or among gathers that are comparable across an ill-defined period of time. To calculate the impact size, the students who participate in all of the evaluations must be included. Two design courses that were offered to the 50 students who appeared to be studying electrical design have been reviewed. EE305 Power Electronics and EE307 Solid State Drives. Action based learning systems have tracked the progress and learning of the understudy throughout the review (Bidanda, B., & Billo, R., 1995).

The use of various assessment methodologies that were advanced in evaluations of students' performance during classes and real-world meetings should be mentioned here as part of the ongoing assessment. However, it should be noted that the work introduced is still only marginally sufficient to support the COs and PSOs for the various Courses recommended to the students (Caroline, B., & Ivan, M, 2004). The impact of action-based learning and appraisal compared to conventional learning frameworks is examined in this paper (Premalatha, K., 2019).. Additionally, it has been assumed that the effect size demonstrates how understudies are presented. The COs and PSOs were planned based on the results that were achieved.

Activity based learning and assessment: a case study:

The process of viewing learning through the perspective of students is known as recognizable learning. Additionally, it is a means of advancement between professors and students. Education and learning are both evident in a successful study hall. Additionally, it is crucial for educators to separate their

diverse perspectives in order to look for other traces of learning evidence (Fallow, L., 1996). Additionally, continuous evaluation plays a more significant role in students' success than summative assessment does. Continuous evaluation continuously monitors the presentation of understudies, developing needs, and styles. Additionally, it enables teachers to practice various persuasion techniques and get feedback on how well a student is progressing (Kloeg, J., & Noordzij, G., 2019). The significance, element, and issue of understudy' academic achievements should be hinted at from Table

TABLE 1
ACHIEVEMENTS OF STUDENTS INFLUENCE THE PARAMETERS

Source of Influence	Feature	Issue
Teaching & Learning	Strategies emphasizing activity based learning intentions	Project based teaching and prerequisite information

The Continuous Internal Assessment (CIA-1 and 2) Examination and the Semester End Examination, which are three distinct hypothetical assessments, have been completed to meet the requirements of the educational plan. Although the impact magnitude has not been assessed differently for the two assessment methods (Rajak, A., Shrivastava, A. K., & Shrivastava, D. P., 2019), the impact of the assessment strategy has been observed in execution in general. Before starting the recognizable winning techniques should be inferred from Table 2, the pre-test was examined.

TABLE 2
STRUCTURE OF EXAMINATION EVALUATION SCHEME

Course	Continuous Internal Assessment		SEE
	CIA1	CIA2	
Course 1: EE305 Power Electronics	Written exam: 20 marks	Activity based learning: 20 marks	Written exam: 100 marks
Course 2: EE307 Solid State Drives	Written exam: 20 marks	Activity based learning: 20 marks	Written exam: 100 marks

It is interesting to think about how the idea of science was added to help with understanding the designing concepts along with impact magnitude, the source of influence, element, and issue. Multiple parallels were developed throughout the semester for both courses to help students grasp difficult concepts. For the sake of conciseness, just one parallel has been mentioned for each subject, and Table 3 depicts the components of the simple and the scientific thought. A few of them have been referred to for speed (Shanableh, A., 2014). The impact of the assessment approach on the understudy's exhibition was noted during the evaluation. It entails ongoing written evaluation or creative evaluation, such as self-directed learning, project-based learning, contextual analysis, and so forth, the understudies had to pick a prospectus item from which to present COs. For CIA-1 and CIA-2 assessments, the result size has been established from condition (1) as

TABLE 3
PRACTICAL BASED ANALOGY

Course	**Scientific concept**	**Source domain**
Course 1: EE305 Power Electronics	**Power Diode**	**Electric fan**
	Forward Bias	Fan start to run
	Reverse Bias	Stop the rotation
	Reverse recovery time	Time taken to reach the rest position of Fan
	Threshold value	Time taken to reach the maximum speed of Fan
Course 2: EE307 Solid State Drives	**DC Drives**	**JCB Machine**
	Battery	Primary operation
	Four quadrant operation	Direction of movements
	Plugging and regenerative braking	With and without the load

$$\text{Outcome size} = \frac{\text{Post evaluation average} - \text{Pre evaluation average}}{\text{Standard deviation average}} \quad (1)$$

The pre-assessment is conducted in advance of implementing action-based learning techniques, and the post-assessment is conducted following the modification of the learning tactics used by the students. Table 4 contains a brief analysis of all the experimental results for the sake of conciseness. In general, when compared to CIA-1, the students did amazingly in both Courses during CIA-2. The results have been examined in terms of standard deviation and impression normality. Every understudy has had their progress and success inferred using a coded tool of observable learning in addition. The system displays the completed impact size coupled with a post-assessment display of the understudies.

TABLE 4
STUDENT RESULT AFTER COMPLETION OF INTERNAL EXAMS

Competency	Course 1: EE305 Power Electronics		Course 2: EE307 Solid State Drives	
	CIA1	CIA2	CIA1	CIA-2
Average marks of students	18.18	24.08	22.23	26.16
Standard divergence	10.55	5.88	8.67	8.44
Standard Deviation Average	8.22		8.55	

From the analysis, it is clear that the implementation of action based learning methodologies has resulted in growth and success. Table 4 shows that during Course 1, the average number of imprints increased from roughly 18 to 26 as CIA-1 and CIA-2 were formed. When taking the CIA-1 exam, students who are on rolls 19 through 24 and 43 receive the highest scores, 38, out of all the candidates. The ninth roll of six indicates the least significant display in the course, which is 1. On the other side, roll number 17 had the highest score with 14 imprints, while roll number 41 had the lowest score with 18. It's interesting to see that the standard deviation stayed close to 8.2 in the both of the courses. Finding the impact of the assessment approach, such as traditional and creative, is vital when doing a developmental assessment.

In segment 4, it was discussed how important it is to recognize the mindful bounds while examining the likelihood of such assessment techniques, potential causes for the declining pattern, and related topics. In general, it is clear from the data that students did better in the course. A result size

greater than the pivot point illustrates the influence of observable learning and achievement.

II. ATTAINMENT OF COS AND POS/PSOS

The learning outcomes are the specific, expressly stated objectives that represent the abilities that the students will truly desire to acquire after successfully completing the assignments. Adopting instructional strategies is essential for achieving the two COs and POs/PSOs in advanced education. The native, public, and global changes that are taking place are consistent with these practises. The COs and POs/PSOs are crucial indicators that can be used to objectively and honestly evaluate instructional techniques (Vaijayanthi, R., & RajaMurugadoss, J, 2019). In this case, an effort has been made to plan COs and POs/PSOs with 50 electrical design undergraduate students for Courses 1 and 2. Table 5 shows the various grades that students in the two courses, ranging from S1 to S50, received.

TABLE 5
GRADE WISE STUDENT COUNT

Grades	Course 1	Course 2
A+	9	11
A	4	3
B+	9	10
B	16	13
C+	6	7
C	3	2
D	2	4
U	1	0
UX	0	0

The general score is determined in accordance with the requirements of the UGC, Universities, and Institutions. The achievement levels are Excellent (E), Skilled (S), Forthcoming (F), and Improvement Needs (I). The CO accomplishment markers can be alluded to from Table 6.

TABLE 6
GRADE WISE STUDENT COUNT

CO attainment of the students team wise	Course-1	Course-2
Excellent (M) (M = (A+) + (A)) grades)	13	14
Skilled(N) (N = (B+) + (B)+ (C+) grades)	31	30
Forthcoming (O) (O = (C) + (D) grades)	5	6
Improvement needs (P) (P = (U) + (UX) grades)	1	0

The Team wise 'M' to 'P' percentage (%) students can be determined by equation (2).

$$Team\ wise\ \%\ students = \frac{\text{M or N or O or P}}{\text{M+N+O+P}} * 100 \qquad (2)$$

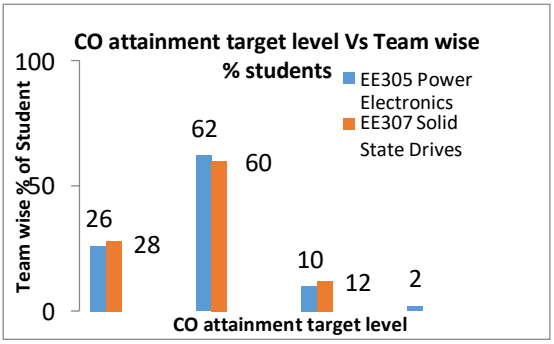

Fig. 1 : CO attainment target level Vs Team wise % students

Fig. 1 presents an analysis of the overall CO accomplishment target level, taking into account group-wise% understudies. As only two of the available courses have been reviewed, the test is, in a sense, limited to those two courses. Looking at two courses (as they were delivered during the semester) is a good way to see how action-based continuous evaluation strategies affect learning. Due to the specific and distinctive nature of the course materials and prerequisites, the COs may not be exactly the same as one another (Thakur, P., & Dutt, S., 2017).

The 'N' pointer in the diagram stands out because it highlights a significant difference between two courses—roughly 20%—in terms of the number of students enrolled in each group. Additionally, 'O' is much larger in Course-2 compared to Course-1, even though 'M' and 'N' quietly increase the classification. Following this study, CO fulfillments are assessed using the essential states of CO achievement (as per Table 7). It's noteworthy to observe that the states of CO fulfillment result in the pointer "Excellent M," indicating that the suggested focus on serves as a positive example. However, it is not constrained; it very well may be carried out for a greater number of students.

TABLE 7
CONDITIONS OF CO ATTAINMENT

CO attainment indicators	Conditions
Excellent (M)	M + N > =50, M > =20
Skilled(N)	M + N > =50, M
Forthcoming (O)	M + N + O > =50
Improvement needs (P)	M + N + O < 50

The COs of both courses have been prepared with the PSOs of the programme, taking (allude to Table 7) this into consideration. The equivalent can be inferred from Table 9.

The results of the measurements demonstrate how progress and success in the courses are impacted by action-based learning and evaluation. The PSO statements for both Courses should be inferred from Table 8. The PSOs cover a range of program-presented courses. The planning of the PSOs and the CO accomplishment indicator(s) is shown in Table 9. It is implied that Course-1 receives "M," the CO achievement pointer, which satisfies the PSO1, and Course-2 receives "M," which meets the division's PSO2.

TABLE 8
PSOS AND COS

PSOs		
PSO1	Design and analyze circuit components, systems that effectively generate, transmit, distribute and utilize electrical power.	
PSO1	Apply the appropriate analog, digital techniques and modern engineering software tools in electrical industry	
COs	**Course 1**	**Course 2**
CO1	Distinguish the types of power semiconductor devices, and analyze their switching characteristics	Illustrate the steady state operation and transient dynamics of a motor load system.
CO2	Demonstrate the operation of single phase controlled rectifiers, and analyze its characteristics	Compare the operation of the converter/chopper fed dc drive, both qualitatively and quantitatively
CO3	Demonstrate the operation of three phase controlled rectifiers, and analyze its characteristics	Demonstrate the VSI fed of Induction Motor drives.
CO4	Apply the different modulation techniques to PWM inverters and identify the harmonic reduction methods.	Distinguish the different control strategies of Synchronous Motor drives
CO5	Choose the appropriate DC-DC converters for different applications	Analyze the current and speed controllers for a closed loop solid state DC motor Drive
CO6	Understand operation of cyclo-converter and matrix converter in AC-AC applications.	Illustrate the different modes of voltage control and converter selection and characteristics.

PSO1 creates and researches circuit components and systems that actually generate, transmit, distribute, and utilise electrical energy. PSO2 Use the appropriate straightforward, sophisticated techniques, and modern designing programming tools in the electrical business.

TABLE 9
MAPPING OF COS WITH PSO

Course	**PSO1**	**PSO2**
Course 1: EE305 Power Electronics	X	-
Course 2: EE307 Solid State Drives	-	X

III. DISCUSSION ON INFLUENTIAL ISSUES OF THE ATTAINMENT OF COS AND POS/PSOS

When evaluated via a activity based learning programme, it can be found that group or individual student performance has decreased. Understudies just had to organize and deliver on a single topic during the task based learning demonstration. The assessment's rubrics were accurate enough to survey and were not consulted for frankness. Between the several assessment methodologies, it has an surprising impact. To truly test students' abilities, a standard written exam includes a variety of questions.

On the other hand, project based learning limits how the assessment is connected. Instead, examining depiction skills could provide variation. However, it is anticipated that the impact size in course-1 may have been impacted by the disparity in the assessment techniques. The understudy may lack the necessary exhibiting abilities. Additionally, in order to increase efficiency, teachers and students should take use of the critical thought and examination frameworks, as well as support from auxiliary staff. Additionally, openness to cutting edge scientific and design practices is essential. Equally important is teacher assistance

IV. CONCLUSION

According to the achieving indicators, encouraging observable studying and corrective feedback can improve cognitive process in the engineering sector. To make a significant difference in a learning environment, the significance level must be 0.38 or greater, which is achieved in the latest research. Even so, a current study is conducted to analyze long-term results in this domain. A facilitator may plan and implement effective ways to improve the formal assessment processes. It is predicted to provide vast experience and to close existing gaps in the engineering education system.

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