

Attainment Of Course Outcomes In Outcome Based Education: A Case Study

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Abstract: In the new Outcome Based Education model as prescribed by National Board of Accreditation (NBA), one of the most important criteria is the Attainment of Course Outcomes (COs). The Course Outcomes can be attained through several Direct and Indirect Assessments. This all can be achieved with clearly defining the Course Outcomes of the Course. In this paper, we have taken a Sample Course and we have clearly explained the methodology used in the assessment of attainment.

Index Terms : Outcome Based Education, Course Outcomes, Direct and Indirect Assessments

I. Introduction

To bring in Quality in Technical Institutions, the Govt. of India is in the process of making Accreditation mandatory. In India, National Board of Accreditation (NBA) is the body responsible for accrediting the Technical Institutions. As India has become the permanent member in Washington Accord since 13 June 2014, Technical Institutions need to follow Outcome Based Education (OBE), if they want to go for accreditation. In OBE, one of the main criteria is the attainment of Course Outcomes. This is very important as these Course Outcomes will be mapped to Programme Outcomes, which in turn will be mapped to Programme Educational Objectives, which will in turn be mapped to Vision and Mission of the Department and Institute. This paper shows the step by step process in the attainment of Course Outcomes.

2. Assessment Tools

To begin with we need to clearly specify various Direct and Indirect Assessment Tools that contribute to the COs attainment [1]. The Direct Tools can be Task 1 and Task 2 Performance, Mid Semester Examination 1 and Mid Semester Examination 2 Performance, Semester End Examination Performance. The Indirect Tools can be Course Exit Survey [2]. The below table summarizes the tools and their weightage in assessment.

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COs Assessment Tools & Weightage

COs	Assessment Tools	Weightage
Task 1 Performance		10% -20%
Task 2 Performance		10% -20%
MSE I Performance		20% -30%
MSE II Performance		20% -30%
SEE Performance		30% -40%
Course Exit Survey		20% -30%

3. Business Intelligence – A Sample Course

A. Defining Course Outcomes

We have considered a sample course viz., Business Intelligence and its Applications, which is being offered in the seventh semester CS and IS streams. We have considered class strength of 40. The following Course Outcomes have been defined along with the attainment planned.

Course Outcomes for Business Intelligence

Sl. No.	Course Outcomes	Attainment Planned
1	Understand the Business View of Information Technology applications and other types of Digital Data	80%
2	Differentiate On -Line Transaction Processing and On -Line Analytical Processing and define BI Concepts	70%
3	Analyze the basics of data integration including data quality and data profiling and implement various data integration approaches.	60%
4	Apply different methods of multi-dimensional modeling and evaluate Key Performance Indicators	70%
5	Create Enterprise Reports and Understand the future of BI	80%

A. Defining the Scheme of Evaluation

Below we have given the Scheme of Evaluation. CIE stands for Continuous Internal Examination.

CIE Scheme:			
Assessment Name	Assessment Method	Maximum Marks	
Task 1	Assignments, Quiz, Role Play etc.	5	
Task 2	Assignments, Quiz, Role Play etc.	5	
Mid Semester Examination 1 (MSE 1)	Test	20	
Mid Semester Examination 2 (MSE 2)	Test	20	
		Total	
		50	
SEE Scheme:			
Assessment Name	Assessment Method	Maximum Marks	Weightage in Marks
Semester End Examination (SEE)	Test	100	50
		Total	
		50	

Overall Evaluation: CIE (50 Marks) + SEE (50 Marks) = 100 Marks

A. Tasks and MSE Performance Analysis

We have given Assignments for both Task 1 and Task 2 in our sample course. Usually Task 1 covers the first Course Outcome. Below table shows the Task 1 Performance Analysis.

Task 1 Performance Analysis

Task No.	CO Mapped	No. of students	Average Marks	% Score
1	1	40	4.5	90%

In Mid Semester Examination 1, there will be four questions two each from first two units. Students need to answer one question from each unit. Each question carries 10 marks. MSE 1 covers first two Course Outcomes. Below table shows the MSE 1 Performance Analysis.

MSE I Performance Analysis

Q. No.	CO Mapped	No. of students Attempted	Average Marks	% Score
1	1	15	9.5	95%
2	1	25	8.0	80%
3	2	30	7.5	75%
4	2	10	8.5	85%

Similarly below tables shows the Task 2 Performance Analysis. Task 2 covers third course outcome.

Task 2 Performance Analysis

Task No.	CO Mapped	No. of students	Average Marks	% Score
2	3	40	4.2	84%

The below table shows the MSE II Performance Analysis. MSE II covers third and fourth course outcomes.

MSE II Performance Analysis

Q. No.	CO Mapped	No. of students Attempted	Average Marks	% Score
1	3	12	9	90%
2	3	28	7.8	78%
3	4	18	8.2	82%
4	4	22	9.2	92%

A. SEE Performance Analysis

SEE will have 10 questions, two questions from each unit. There are five units. Students need to answer one question from each unit. Each question carries 20 marks. SEE covers all the five course outcomes. Below table shows the SEE Performance Analysis.

SEE Performance Analysis

Q. No.	CO Mapped	No. of students Attempted	Average Marks	% Score
1	1	10	18	90%
2	1	30	18	90%
3	2	12	16	80%
4	2	28	14	70%
5	3	16	17	85%
6	3	24	19	95%
7	4	20	14	70%
8	4	20	16	80%
9	5	9	18	90%
10	5	31	16	80%

A. Course Exit Survey Analysis

Finally, the Course Exit Survey will be analyzed. The survey form contains all the course outcomes and the students will rate their level of attainment as 5-Excellent, 4-Good, 3-Average, 2-Below Average and 1-Poor. The below table shows the Course Exit Survey Analysis.

Course Exit Survey Analysis

Criteria	No. of students who marked					% Score
	Opt 1	Opt 2	Opt 3	Opt 4	Opt 5	
1				10	30	95%
2			07	08	25	89%
3				15	25	92.5%
4			04	03	33	94.5%
5				20	20	90%

A. Attainment of Course Outcomes

Now, taking all the inputs, we need to calculate the attainment of Course Outcomes. The below table shows the attainment of Course Outcomes.

Attainment of Course Outcomes

COs	Assessment Tools	Weightage	Score	% Attainment
1	Task 1 Analysis	10%	9.00	90.25%
	MSE I Performance Analysis	30%	26.25	
	SEE Performance Analysis	40%	36.00	
	Course Exit Survey Analysis	20%	19.00	
2	MSE I Performance Analysis	30%	24.00	80.70%
	SEE Performance Analysis	40%	30.00	
	Course Exit Survey Analysis	30%	26.70	
3	Task 2 Analysis	10%	8.40	88.10%
	MSE II Performance Analysis	30%	25.20	
	SEE Performance Analysis	40%	36.00	
	Course Exit Survey Analysis	20%	18.5	
4	MSE II Performance Analysis	30%	26.10	84.45%
	SEE Performance Analysis	40%	30.00	
	Course Exit Survey Analysis	30%	28.35	
5	SEE Performance Analysis	70%	59.50	86.5%
	Course Exit Survey Analysis	30%	27.00	

4. Conclusion

In this paper, we have considered a real time data for analyzing the attainment of Course Outcomes. It is evident that the actual attainment of the Course Outcomes is meeting the planned expectations. The direct and indirect tools used for the assessment and their weightages can be suitably selected as per the requirement of the Institute [3].

References

- [1] National Board of Accreditation Training Material for Evaluators / Stakeholders on Outcome Based Accreditation Process & Parameters.
- [2] Engineering Staff College of India Reading Material on Quality Initiatives in Technical and Higher Educational Institutions.
- [3] National Board of Accreditation website: www.nbaind.org