International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Implementations of OBE in the Design of the Course and Assessment Strategies

Sumana Jayaprakash

Asst Professor, Department of Civil Engineering, Malnad College of Engineering, Salgame Road, Hassan, India
sumanajpmce[at]gmail.com

Abstract: ***Seminar is a course offered to 8th semester Civil engineering students. The course requirement is individual work by the student applying engineering concepts, defining problem statement, investigating into the problem, finding solutions and presentation. The course has been designed as two stages. This paper is a review paper on the demonstration of the implementations of OBE in the design of the course and the method of assessment. The design of the course aims at transforming the student to demonstrate his core competencies, be able to innovate solutions and emerge with leadership skills and a sense of responsibility. Assessment is based on the methodology, presentation, reporting, justification of the usefulness of seminar paper, quality of slides, presentation, Interim report and Final Report. The design of the course is based on higher order thinking level of the Blooms taxonomy, each of the course outcomes mapped with the program outcomes. Rubrics are designed for effective assessment. Detailed work can be carried out further, on this work in terms of working out the competencies and the Performance level Indicators to qualify the Program outcomes, mapped with the Course outcomes, for qualifying the exact expectations from the student.***

Keywords: Course Design, Assessment, tools, learning

1. Introduction

The key factor in the Course Design Process is the Visualization of the outcome picture. The teacher has to have a very clear understanding of the purpose of the course, the intent and the compliance required and its relationship with the program outcomes. The assessment tools will aid in the attainment of outcomes. These assessment tools are aligned with the Program outcomes. For an appropriate attainment of Program outcomes and course outcomes, a set of factors as in the methodology below is crucial. This paper demonstrates the application of these factors.

2. Methodology

Factors for direct attainment of Program outcomes and course outcomes

(a)The course Design Process
(b) Assessment tools and factors of assessment.
(c) Designing of the Rubrics.
(d) Designing the level of learning.
(f) Details of the work for stage 1 and stage 2 with the Cos and PO alignment and submission format.
(g) Mapping of CO with the POs
(f) Course articulation Matrix with the example of CO-PO direct attainment.

(a) The course design process:

1. Creation of the learning environment

Creation of the learning environment is to make sure that learning happens. Based on the picture of the outcome visualized by the teacher, the learning environment is created. It is a tailor made environment based on the capability of the teacher to align it with the outcome visualized. It works on the premise that each student has a unique skill makeup, pace and capability of learning. It accommodates every student, and creates opportunities for every student's learning. This fact is made aware to every student, to make sure that he/she takes his own path and pace of learning within the scheduled design of the course and the time frame. The time of learning will not be in the rigid structured format, but a flexible student-teacher platform of anywhere anytime learning, in addition to the formal hours of teaching-learning time. Effective use of ICT learning management systems ensures learning all the time.

2. Application of Higher order thinking Skills:

By appropriate creation of the environment learning happens. Taking note of the expected high level of both cognitive and broad based skills required for the student to be fit for the industry, the higher order skill application expectation is designed and the teacher ensures creation of a conducive platform for its attainment.

3. Detailed methodology:

The design of the course is based on simple and small achievable steps. If the required goal of the next step is not achievable, there is a prequalifying exercise or study matter, which will make the student eligible for the next step. The entire network of the paths is a complicated one, allowing for students with different levels of capabilities. A fast and advanced learner may take a straight path in his area of expertise, but the same student may traverse at a slower pace, taking the prequalifier and then coming on to the main path in the area where he is a slow learner. Here the student chooses his path, keeping the completion criteria and the time period for completion in focus. The teacher having comprehended the path selected by the student makes sure by observation that the student is learning and monitors his/her progress.

Licensed Under Creative Commons Attribution CC BY

(b) Types of assessment tools and factors for assessment:

Tool 1: Alignment to criteria:

Assessment factors: Student's understanding of domains, process of selection of domain for work, study of focus area and presentation.

Format: Discussion with the course co-ordinator.

Tool 2: Art and communication of the work process:

Assessment factors: Identification of work area, and justification, Evaluation of the factors under consideration and methodology adopted. Presentation and report writing
Format: General observations by course co-ordinator

Tool 3: Real life learning Experience adoption

Assessment factors: Justification of the usefulness of seminar paper to the society, importance of the Dimension of environment and sustainability, quality of the contents and presentation techniques adopted.

Format: Formal oral presentation

Tool 4: Final Performance based:

Assessment factors: Final Report and Oral presentation.

Format: Soft copy of work uploaded on moodle.

Hard copy submission.

(c) Designing of Rubrics:

For effectively assessing student performance a set of criteria is developed. Clearly defined attributes of the desired outcomes ease out the process of assessment. As the jury consists of various faculties, the rubrics bring about uniformity in assessments strategies.

Criteria for Rubrics: Student's understanding of domains, process of selection of domain for work, study of focus area and presentation. Evaluation of the factors under consideration and methodology adopted. Justification of the usefulness of seminar paper to the society, importance of the dimension of environment and sustainability, quality of the contents and presentation techniques adopted. Final Report and Oral presentation.

Grading criteria will depend on how well the above criteria have been demonstrated by the student:

A: Awarded if the student has exceedingly well met all the defined criteria, with an understanding of the content, application of the required knowledge and demonstration of innovative thinking and design strategies.

B: Awarded if the student has effectively met all the criteria well.

C: Awarded if the student has satisfactorily met at least 60% of the criteria and shown effort to meet the rest of the criteria.

D: Work is incomplete, even if completed in some areas not satisfactory.

A small segment of Grade upgradation zone is allowed for underperformance shown in the work by the student. The reason may be communication gaps, lower understanding and inability of the student to carry out the work as per criteria. In order to his understanding and ability, he can redo the work and apply for upgradation of his grades in the interim process. Whether his grades will increase, will depend on the assessment of his work by the teacher and discussion with the student to find out about his improved ability.

(d) Designing the level of learning by adopting the Bloomsbury taxonomy verbs:

The verbs define and guide to design the question/ work process/ requirements for meeting the course criteria, making it clear to both the teacher and the student and binding them with a common string. It eases out the teaching learning process and aligns the course outcomes to the learning/ difficulty level with which it is to be met. Higher order thinking skill demonstration is required, and it encompasses the lower level skills like remembering and understanding.

The student is required to demonstrate the knowledge and skill based competencies, with a strong knowledge base and broad based skills of leadership and other attributes.

The course outcomes designed are as follows:

CO1	Investigate and Be conversant with developments in the field of civil engineering in general	PO1,PO2,PO3, PO10
CO2	Organize and Communicate with the peers and the faculty on topics of technical interest	PO2,PO3,PO4,PO9,PO10
CO3	Prepare to take up higher studies or research work	PO2,PO4,PO5
CO4	Formulate the inferences from various sources and present the same effectively	PO3,PO4, PO10
CO5	Effectively demonstrate the findings with modern tool usage, oral and written communication	PO1,PO3,PO5, PO10
CO6	Define problem statement useful to the society, in terms of environment and sustainability, carry on investigation by comparative studies, evaluation, design development, author the seminar paper with original ideas and thoughts, and make effective presentation. Enhance confidence level by focusing the attention on a given topic	PO2,PO4,PO5,PO6, PO7 PO8, PO10 PO12

Licensed Under Creative Commons Attribution CC BY

(e) Design of 1stage of the course: seminar					
STAGE 1 SEMINAR QUESTIONS ASSIGNED TO 8TH SEMESTER CIVIL ENGG STUDENTS, AT HIGHER ORDER THINKING LEVEL OF BLOOMS TAXONOMY, IN RELATION TO THE COURSE OUTCOMES AND PROGRAM OUTCOMES: STUDENT NAME: SEAT NO:					**STUDENT PHOTO**
marks	**QUESTION**	**CO**	**PO**	**BT LEVEL**	**FORM OF SUBMISSION**
70	**STEP 1:** Based on your aspiring pay packet and job profile, your dream company and domain (construction/ consultancy / R and D / Environmental / research based company) SELECT the company where you see yourself working in, one year from now. Present your choice on your selection of the domain and the company in the form of report	CO1	PO1 PO2 PO3 PO10	BT 5	Discussion with the course co-ordinator.
20	**STEP 2**: EVALUATE the company profile with two other companies in the same domain and justify your choice for selection.	CO4	PO3 PO4 PO10	BT 5	
90	**STEP 3**: IDENTIFY the research / product development / safety etc: area that the company of your selection is working upon, SELECT an area of that work for your seminar paper.	CO3	PO2 PO4 PO5	BT 2	Formal oral presentation
130.	**STEP 4:** DISCUSS with faculty of the Department of your topic selected and finalize the same. JUSTIFY the need of the research / development work, the usefulness of the same to the society and its contribution to the Environment and sustainability.	CO6	PO2, PO4 PO5 PO6 PO7 PO8 PO10 PO12	BT 4	One A4 size sheet PDF uploaded on moodle.
70	**STEP 5**: SELECT an Alumni working in the domain of your selection. STUDY his/ her profile. DISCUSS and decide your seminar topic in co-ordination with the Alumni. PRESENT your choice to seminar co-coordinator.	CO2	PO2 PO3 PO4 PO9 PO10	BT 3	Photo of meeting with Alumni, hard copy of Alumni Profile.
100	**STEP 6**: PRESENT the Title of the Seminar Paper/ keywords/ and the abstract SUBMIT hard copy (1 A4 sheet) to the seminar co-coordinator.	CO5	PO1, PO3 PO5 PO10	BT6	One A4 size sheet PDF uploaded on moodle and hard copy.
	WRITE THE TITLE, KEYWORDS AND ABSTRACT				Upload on moodle
20	**STEP 7**: DEVELOP and DESIGN three slides for 3 min presentation on the above work that you have done.	CO6	PO5 PO7 PO10	BT 6	Slide presentation. Oral comments
	STEP 8: Feedback:				on Moodle

	STAGE 2 QUESTION	**CO**	**PO**	**BT LEVEL**	**FORM OF SUBMISSION**
60	**STEP 1:** Based on the comments given DEVELOP the Seminar process/ methodology in the form of literature survey/ INVESTIGATION/ EXPERIMENTATION/ ANALYSIS/ Case studies etc. Discuss with the Alumni.	CO4	PO3 PO4 PO10	BT 3	Two A4 size sheet PDF uploaded on moodle.
20	**STEP 2**: INTERIM REPORT submission based on feedback given in step 1.	CO6	PO4 PO10	BT 3	Pdf upload in moodle
20	**STEP 3**: FINAL REPORT preparation and Presentation, with the reference to carry out further investigation with the present paper as reference, Relevance and usefulness of the paper in the bigger context. Final Report submission in the prescribed format.	CO6	PO6 PO7 PO8 PO10 PO12	BT 6	Slide (12 nos) Presentation
	STEP 4: FEEDBACK				

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	X	X	X							X		
CO2			X	X					X	X		
CO3		X	X	X								
CO4			X	X						X		
CO5	X		X		X					X		
CO6		X		X	X	X	X	X		X		X
					X		X			X		

Licensed Under Creative Commons Attribution CC BY

(f) CO-PO MAPPING FOR THE COURSE CV801: SEMINAR

3: High level of co-relation 2: moderate level of co-relation 1: Low level of co-relation

CO-PO Mapping												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3							3		
CO2			3	3					2	3		
CO3		2	2	3								
CO4			3	3						2		
CO5	3		2		3					2		
CO6		3		3	3	3	3	1		3	-	1

Program Outcomes:

PO1 Engineering Knowledge
PO2. Problem Analysis
PO3. Design/development of solutions
PO4. Conduct Investigations of complex problems
PO5. Modern tool usage
PO6. The engineer and society
PO7. Environment and sustainability
PO8. Ethics
PO9. Individual and team work.
PO10. Communication

Bloomsbury taxonomy keywords:

1. Remember.
2. Understand.
3. Apply.
4. Analyze.
5. Evaluate.
6. Create

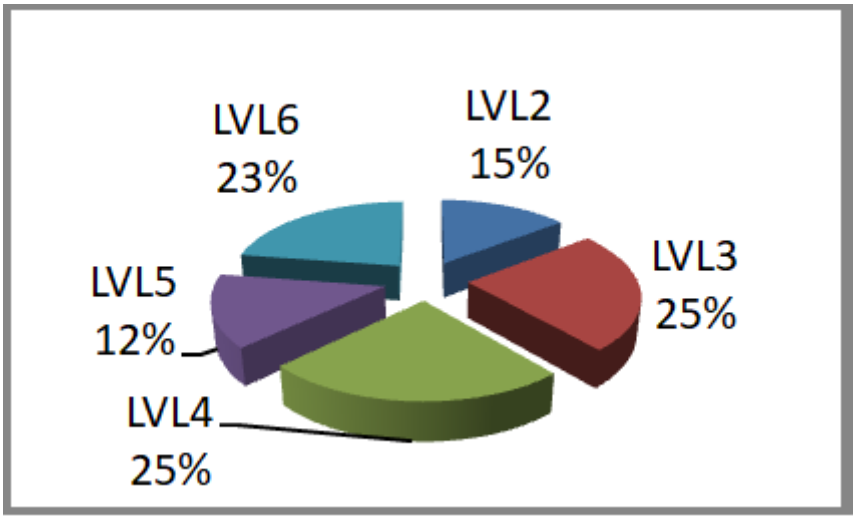
(g) CO-PO Articulation matrix	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	CO ATTAINMENT
CO1	X	X	X							X			CO direct ATTAINMENT
STAGE 1 STEP 1 UNDERSTANDING OF DOMAINS	10 7	10 7								40 30			**80 (weight) 61 76.25%**
STAGE 1 STEP 2 PROCESS OF SELECTION			20 15										
CO2			X	X					X	X			
STAGE 1 STEP 5 STUDY OF ALUMNI PROFILE			20 13	10 8					20 12				**70(weight) 48 68.57%**
STAGE 1 STEP 5 PRESENTATION										20 15			
CO3		X	X	X									
STAGE 1 STEP 3 IDENTIFICATION OF WORK AREA		20 13	20 12										**90 (weight) 60 66.66%**
STAGE 1 STEP 3 JUSTIFICATION OF SELECTION				50 35									
CO4			X	X						X			
STAGE 1 STEP 1 EVALUATION OF COMPANY PROFILE			10 7										**60 (weight) 45 75%**
STAGE 2. STEP 1				30						20			

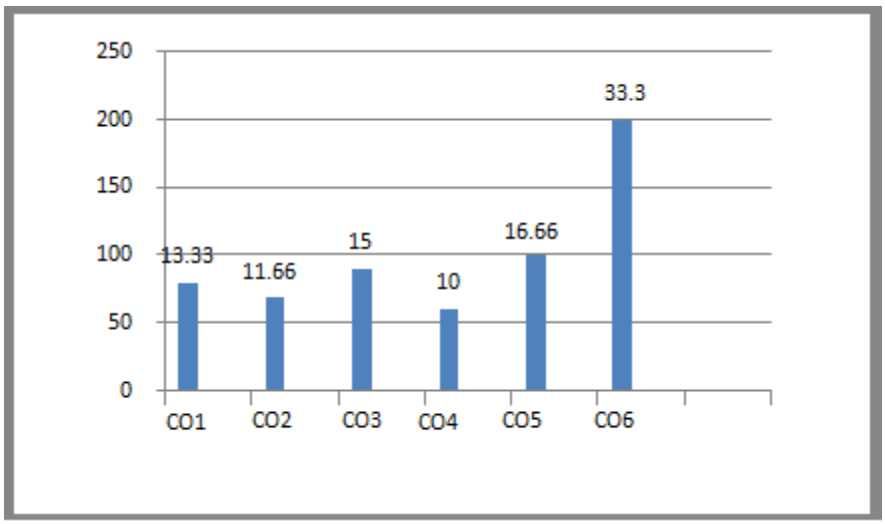
Licensed Under Creative Commons Attribution CC BY

METHODOLOGY				22						15			
CO5	X		X		X					X			
STAGE 1 STEP 6 PRESENTATION	10 6		10 6		50 35					10 6			**100(weight) 67 67%**
STAGE 1 STEP 6 REPORT										20 14			
CO6		X		X	X	X	X	X		X		X	
STAGE 1 STEP 4 JUSTIFY USEFULNESS		10 7		10 7		40 32	20 15	20 15		10 8		20 14	**200(weight) 149 74.5%**
STAGE 1 STEP 7 QUALITY OF SLIDES					20 13								
STAGE 1 STEP 7 PRESENTATION										10 7			
STAGE 2 STEP 2 INTERIM REPORT SUBMISSION					20 15								
STAGE 2 STEP 3 FINAL REPORT SUBMISSION										20 16			
PO direct ATTAINMENT	**20 13**	**40 27**	**80 53**	**100 72**	**90 63**	**40 32**	**20 15**	**20 15**	**20 12**	**150 111**	-	**20 14**	
	65%	**67.5%**	**66.25%**	**72%**	**70%**	**80%**	**75%**	**75%**	**60%**	**74%**		**70%**	

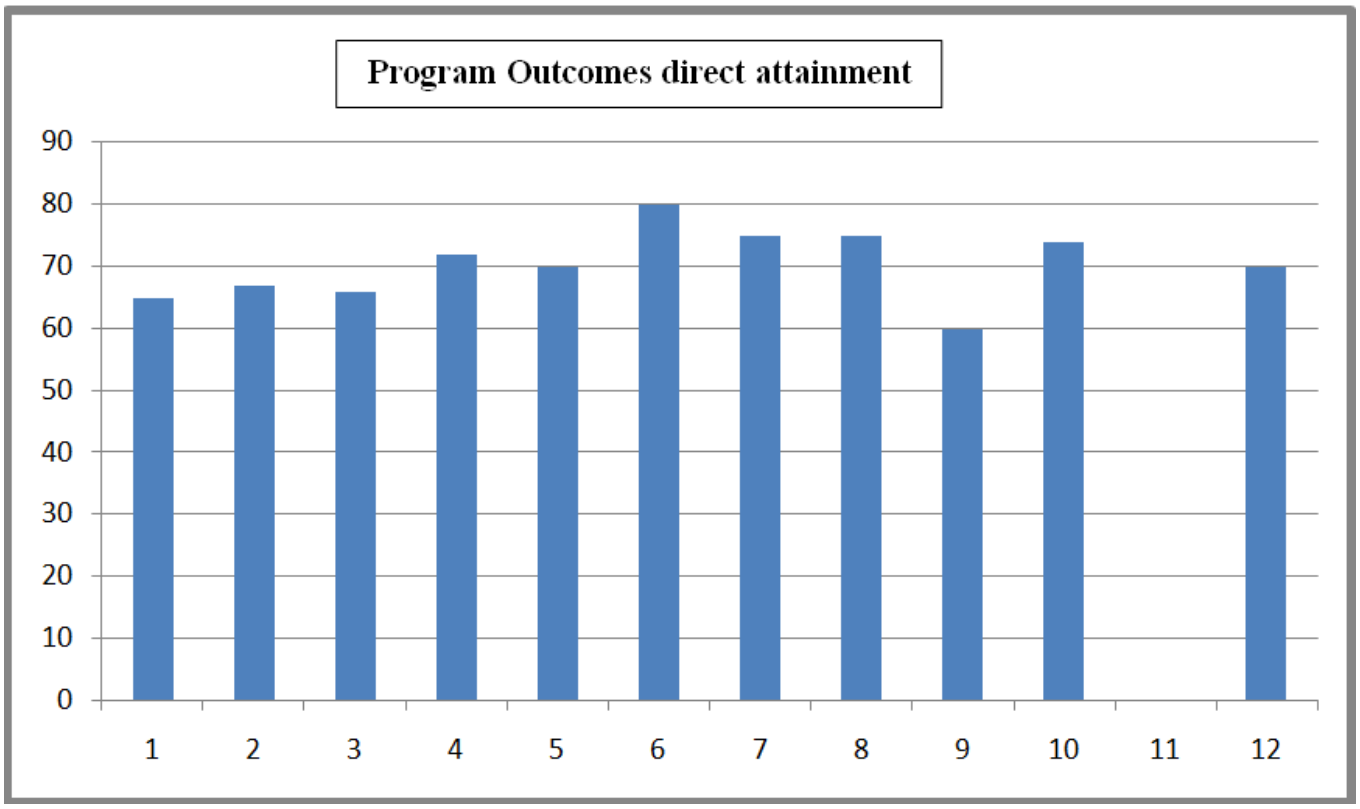
Direct CO Attainment: **71.33%**
Direct PO Attainment: **70.43%**

Blooms' Level wise Marks Distribution Course Outcomes wise Marks Distribution

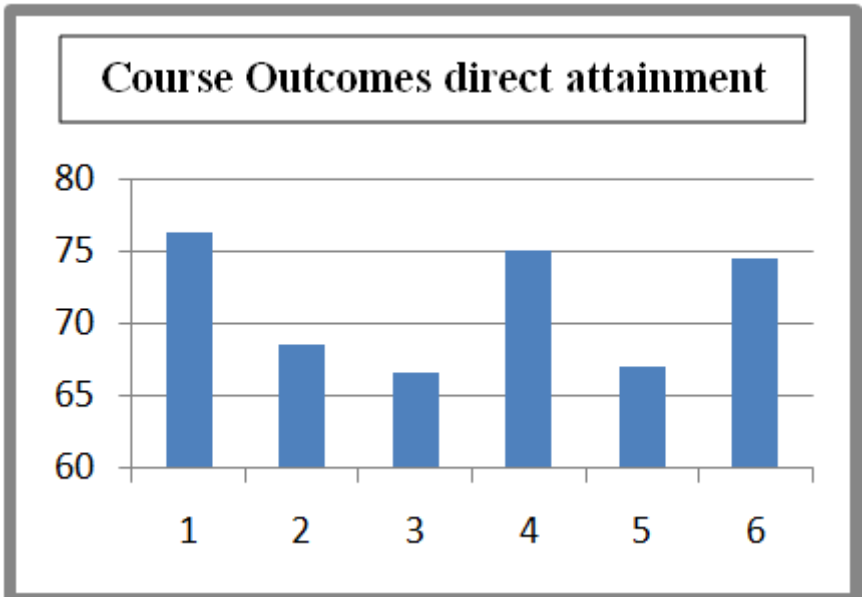




Licensed Under Creative Commons Attribution CC BY



CO-PO DIRECT ATTAINMENTS			
C O	%	P O	%
CO1	76.25	PO1	65
CO2	68.57	PO2	67.5
CO3	66.66	PO3	66.25
CO4	75	PO4	72
CO5	67	PO5	70
CO6	74.5	PO6	80
		PO7	75
		PO8	75
		PO9	60
		PO10	74
		PO12	70
OVERALL	71.33		70.43



Licensed Under Creative Commons Attribution CC BY

3. Conclusion

A effective of the implementations of OBE in the design of the course and the method of assessment, requires a vision of concepts of design parameters and a set of methodologies including the understanding of the course requirements, Program outcomes, appropriate assessment tools and strategies with rubrics and an understanding of the level of difficulty to be adopted, by which the teacher can effectively design the weighted CO-PO articulation matrix for the course. Course design changes can be made by varying one/many of the parameters of Design. This framework can be adopted and taken ahead by another or the same course faculty by applying modifications for better CO-PO attainments.

References

[1] http:// dypcoeakurdi.gnomio.com/
[2] Manual of AICTE sponsored Two weeks Pedagogical FDP. DYP College of Engineering, Pune.
[3] Examination Reform Policy Nov 2018, All India Council of Technical Education, New Delhi

Licensed Under Creative Commons Attribution CC BY