

PRACTICING OUTCOME BASED EDUCATION IN PAKISTAN UNIVERSITIES: A STEP TOWARDS GLOBALIZATION

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Abstract

Outcome based education is a system of education in which steps about the implementation of a curriculum are determined by a program specific learning outcomes students would have achieved at the time of their graduation. These steps consist of course content, educational policies, stake holders input and assessment methodologies.

Since Pakistan is one of those few countries who are still following the traditional teacher centric methodology, it is desired to switch to the outcome based education system to be compatible with the rest of the developed world.

In this paper, authors describe their experience of using faculty course assessment report for the assessment of student performance in ECON 341 Mathematical Economics, a BS in Economics course offered at Economics department of Abasyn University Peshawar.

Keywords: Outcome based education, faculty course assessment report, program learning outcomes

Introduction

Outcome based education (OBE) is an education system in which decisions about the implementation of a curriculum are determined by a program specific learning outcomes that students would have achieved at the time of their graduation. These decisions are based on course content,

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educational strategies, stake holders (students, teachers and employers) input and assessment methodologies

OBE system is based on preparing program specific learning outcomes which:

- Focus on student learning rather than teacher centric
- Expect students to successfully attain intended knowledge and abilities based on Bloom's taxonomy and certain key performance indicators (KPI).
- Continuous quality improvement process through rigorous direct and indirect assessments such as exams, quizzes, home assignments, course exit surveys, employer surveys etc.

Spady (1993) has defined OBE as, "Outcome based does not mean curriculum based with outcomes sprinkled on top. It is a transformational way of doing business in education"

According to Towers (1996), OBE is student centric and result oriented methodology of education. J. Biggs & C. Tang (2007) explain the logic of OBE as, "The logic is stunningly obvious: Say what you want students to be able to do, teach them to do it and then see if they can, in fact, do it"

Mahmood (2015) pointed out that as compared to the traditional education system, OBE system, emphasizes on learning rather than what is being taught and this would necessitate to set course objectives in terms of student learning outcomes through a documented assessment mechanism.

Some of the advantages of OBE system are

- Assimilation of knowledge by learning specific course/program learning outcomes
- Student centric approach with consistent feedback from stack holders
- Effective teacher student communication through shared understanding of course and program learning outcomes
- Proactive student engagement in the program as compared to passive involvement in the traditional teacher centric education system
- Enhanced student performance due to better understanding of teachers' expectations and assessment processes
- Increased transparency and answerability of universities

Assessment of student performance is an integral part of OBE system which consists of three layers, namely program educational objectives (PEOs'), student learning outcomes (SLOs') and course learning Outcomes (CLOs').

Higher education (HEC) Pakistan has defined SLOs' for few programs but in absence of effective assessment methodology, teaching strategies are still teacher centric in all undergraduate programs.

In this paper, we have performed the third layer of assessment, i.e., CLO assessment of ECON 341: mathematical Economics a BS in Economics

course offered at Economics department of Abasyn University Peshawar by using faculty course assessment report (FCAR). FCAR is a comprehensive document encompassing all the relevant data as mentioned by Estell (2003). Estell (2012) further claimed that FCAR is an effective documentation tool for CLOs' and SLOs' assessment. Course data collection and. FCAR is successfully used as CLO assessment strategy by Faiz (2015) for ABET accreditation of electrical engineering technology program. Mahmood (2015) has also performed CLO/SLO assessment using this tool.

For this paper, we have adopted SLOs' and CLOs' from HEC BS Economics 2018 curriculum.

CLO Assessment

Table 1. ECON 341: Mathematical Economics Course Learning Outcomes

CLO#	Course learning Outcomes
1	APPLY calculus and liner algebra concepts to solve economic questions.
2	DEMONSTRATE the understanding of research in economics from mathematical point of view
3	CALCULATE economic numerical by using mathematical tools
4	VALIDATE standard economic theory by applying mathematical techniques
5	DETERMINE economics models by using numerical techniques learned in linear algebra and calculus

SLOs' for BS Economics program are:

- a. Ability to analyze real world economic issues and evaluate assumptions in situation that results in several conclusions to an explicit economic/policy issue.
- b. Ability to utilize empirical evidence to assess the validity of an economic argument by using the statistical techniques and conduct applicable statistical analysis.
- c. Ability to calculate structured and unstructured economics numerical
- d. Ability to apply critical and quantitative thinking skills specific to economics.
- e. Ability to communicate effectively orally and in writing on economics activities

Table 2. Mapping of ECON 341 Course Learning Outcomes to Program Outcomes

CLO#	Program Learning Outcomes				
	a	b	c	d	e
1					
2			✓		
3		✓			
4					
5					
6					

ECON 341 is a 5th semester three credit hours' course offered in spring every year.

Course Learning Outcomes (CLO's)

CLOs' for ECON 341 are shown in table 1. In CLOs' 1-3, students are familiarized with the basic mathematical tools enabling them to understand the economic theory, whereas in 4-5, students learn to use mathematical tools in clarifying economic concepts.

Assessment of Course Learning Outcomes

CLOs' assessment for ECON 341 offered in Spring 2020 at the Economics Department Abasyn University Peshawar is performed in this section. Assessment data is collected is from quizzes, home tasks, a mid and final term exam.

We have used EAMU as a performance vector shown in table 3 as:

E is exceptional, A denotes adequate, M represents minimal and U is unsatisfactory. An arbitrarily selected score of 2 on a cohort level will result in the students' performance being satisfactory.

Table 3. EAMU Vector Description

Category	Point Value	Description
Exceptional (E)	3	Student applies knowledge with no theoretical or procedural mistakes
Adequate (A)	2	Student applies knowledge with no momentous theoretical errors and minor procedural mistakes
Minimal (M)	1	Student applies knowledge with sporadic theoretical errors and minor procedural mistakes
Unsatisfactory (U)	0	Student applies knowledge with substantial theoretical and procedural mistakes

Student marks distribution are shown in table 4-7. Table 4 shows percentage EAMU vector range for all categories in which students were tested. EAMU vectors are calculated by averaging E, A, M and U scores, for example we have found the average as below

$$\text{Average} = \frac{1 \times 3 + 3 \times 2 + 11 \times 1 + 3 \times 20}{20} = 1.0 \quad (1)$$

In this paper we have used the hypothetical students' IDs' to hide the true IDs' of students.

Table 4. Quiz Marks Distribution

S#	Hypothetical Student ID	1	2	3	4
1	5536	5.0	7.0	7.0	8.0
2	5153	7.0	6.0	8.0	5.0
3	5583	6.8	5.0	7.0	7.0
4	4877	6.0	4.0	7.0	3.0
5	5042	5.0	6.0	6.0	7.0
6	11111	7.0	6.0	8.0	6.0
7	5099	9.0	7.0	9.0	8.0
8	5714	5.0	7.0	8.0	7.0
9	6278	4.0	5.0	8.0	6.0
10	4824	7.0	8.0	8.0	7.0
11	4967	6.0	7.0	8.0	8.0
12	5063	7.0	8.0	9.0	8.0
13	5725	7.0	9.0	10	9.0
14	4800	8.0	7.0	8.0	8.0
15	5069	5.0	7.0	6.0	5.0
16	4928	7.5	5.0	10	9.0
17	4372	6.5	8.0	9.0	7.0
18	5721	6.0	9.0	8.0	7.0
19	4922	8.0	8.0	9.0	6.0
20	5596	7.0	8.0	8.0	5.0
	Total	10	10	10	10
	E	1.0	2.0	6.0	2.0
	A	3.0	5.0	9.0	5.0
	M	11	9.0	5.0	9.0
	U	5.0	4.0	0	4.0
	Average	1.00	1.25	2.05	1.25

Table 5. Home Task Marks Distribution

SNO	Student ID	1	2	3	4	5
1	5536	9.0	8.0	6.0	7.00	0.00
2	5153	9.0	8.0	8.0	9.00	0.00
3	5583	7.0	6.0	10	10	10
4	4877	9.0	4.0	7.0	6.0	0
5	5042	9.0	9.0	8.0	6.0	5.0
6	11111	10	8	10	5.0	8.0
7	5099	7.0	8.0	8.0	8.0	6.0
8	5714	9.0	6.0	10	7.0	6.0
9	6278	9.0	8.0	8.0	9.0	8.0
10	4824	8.0	9.0	8.0	8.0	8.0
11	4967	7.0	8.0	8.0	6.0	7.0
12	5063	7.0	0.0	9.0	6.0	9.0
13	5725	8.0	7.0	10	10	8.0
14	4800	7.0	9.0	8.0	7.0	8.0
15	5069	8.0	6.0	7.0	7.0	6.0
16	4928	10	10	6.0	7.0	7.0
17	4372	7.0	6.0	8.0	8.0	7.0
18	5721	8.0	8.0	6.0	6.0	9.0
19	4922	8.0	8.0	9.0	6.0	8.0
20	5596	8.0	9.0	10	10	10
	TOTAL	10	10	10	10	10
	E	8.0	5.0	7.0	5.0	4.0
	A	6.0	8.0	8.0	3.0	6.0
	M	6.0	5.0	5.0	11	6.0
	U	0	2.0	0	1.0	4.0
	Average	2.1	1.80	2.1	1.60	1.5

Table 6. Question Wise Mid Term Exam Marks Distribution

S.No	Student ID	1	2	3	4	5
1	5536	4.0	3.0	4.0	0	5.0
2	5153	3.0	4.0	4.0	0	5.0
3	5583	5.0	4.0	4.0	2.0	5.0
4	4877	4.0	3.0	3.0	0	6.0
5	5042	3.0	3.0	6.0	6.0	5.0
6	11111	5.0	5.0	5.0	5.0	6.0
7	5099	2.0	4.0	5.0	3.0	4.0
8	5714	5.0	5.0	6.0	6.0	6.0
9	6278	3.0	3.0	5.0	4.0	5.0
10	4824	2.0	3.0	5.0	4.0	4.0
11	4967	4.0	3.0	4.0	5.00	5.0
12	5063	2.0	5.0	5.0	5.00	5.0
13	5725	3.0	3.0	5.0	2.00	4.0
14	4800	5.0	5.0	5.0	5.00	5.0
15	5069	3.0	4.0	4.0	5.0	4.0
16	4928	5.0	5.0	6.0	6.0	7.0
17	4372	2.0	5.0	5.0	3.0	5
18	5721	5.0	4.0	4.0	2.0	5.00
19	4922	4.0	5.0	4.0	5.0	6
20	5596	5.0	4.0	3.0	5.0	5
	TOTAL	5.0	6.0	6.0	5.0	8
	E	7.0	0	3.0	10	0
	A	4.0	7.0	8.0	2.0	5.0
	M	5.0	6.0	7.0	2.0	11
	U	4.0	7.0	2.0	6.0	4.0
	AVG.	1.99	1.19	1.99	2.19	1.31

Table 7. Question wise Marks Distribution for Final Term Exam

S.No	Student ID	1	2	3	4	5
1	5536	8	6	6	8	2
2	5153	9	6	6	9	8
3	5583	9	7	4	8	5
4	4877	8	6	5	10	9
5	5042	8	6	6	8	5
6	11111	9	7	6	7	8
7	5099	7	6	3	7	10
8	5714	7	7	5	4	8
9	6278	5	8	8	7	7
10	4824	7	6	10	5	6
11	4967	7	5	6	7	5
12	5063	6	9	9	8	6
13	5725	6	6	7	8	5
14	4800	5	6	6	8	5
15	5069	7	7	9	8	8
16	4928	8	6	4	5	8
17	4372	7	8	7	8	8
18	5721	8	10	5	8	7
19	4922	7	4	8	7	9
20	5596	8	7	7	8	9
	TOTAL	10	10	10	10	10
	E	3	2	3	2	4
	A	6	2	2	10	6
	M	9	14	9	5	4
	U	2	2	6	3	6
	Average	1.5	1.2	1.2	1.55	1.4

Table 8. Grading Scores

Assessment	Weightage(%)
Mid Term	30
Final Term	50
Quiz	10
Home Task	10
Total	100

Table 9. Letter Grading

Letter Grade	Weightage
A	88 – 100
B ⁺	81 – 87
B	74 – 80
C ⁺	67 – 73
C	60 – 66
F	00 – 59

Table 10. Weighted Average Marks from All Assessments

Student No.	Total
5536	57.4
5153	66
5583	66.76
4877	63.2
5042	68.2
11111	76.6
5099	65
5714	72
6278	68
4824	66.2
4967	64
5063	72.6
5725	64.6
4800	69
5069	70.4
4928	74.3
4372	71.3
5721	71.4
4922	73
5596	76

Table 11. Course Grading

Grades	Grade Awarded
A	0
B ⁺	0
B	3
C ⁺	8
C	7
F	1

Grade Distribution

Student grades are depicted in table 12. Course GPA is found as

$$GPA = \frac{\sum \text{Qualifying points of grade}}{\text{Number of students}} = \frac{Y}{A} = \frac{43}{20} = 2.15 \quad (2)$$

Where Y represents qualifying points of grade and is found as

$$Y = 4 \times A(A) + 3.5 \times A(B^+) + 3 \times A(B) + 2.5 \times A(C^+) + 2 \times A(C) \quad (3)$$

Assessment of CLOs' and SLOs'

Assessment of CLOs' and SLOs' is performed for ECON 341 using the EAMU vector points. Table 12 displays mapping of course CLOs' to program SLOs' by taking the average EAMU vector values from tables 4-7. This assessment is termed as direct assessment. Similarly, the average

EAMU point scores of all assessments pertaining to a particular CLO are entered in Table 12.

Table 12. Mapping of CLO's to Program SLOs' Using Average EAMU Scores (Direct Assessment)

CLO#	Program Learning Outcomes				
	a	b	c	d	e
1.					
2.			Quiz2: 1.25 Home Task2: 1.80		
3.		Home Task (4): 1.60			
4.			Midterm (4): 2.2		
5.		Final Exam(5): 1.40			
6.					
Average		1.5	1.75		

Indirect Assessment of CLOs' and SLOs'

For indirect assessment, students were asked to provide their feedback about the course via course exit survey. Students' response is shown in table 13. The scaled average is found as

Scaled Average

$$= \frac{3(4 \times C_4 + 3 \times C_3 + 2 \times C_2 + 1 \times C_1)}{4(C_4 + C_3 + C_2 + C_1 + C_0)} \quad (4)$$

Whereas C_4 , C_3 , C_2 , C_1 and C_0 represent numbers of students respectively. Scaling is performed for compatibility with the EAMU vector point. Mapping of CLOs' and SLOs' is performed in table 13.

Table 13. Course Exit Survey (Indirect Assessment)

CLO No.	4 Strongly Agree	3 Agree	2 Neutral	1 Disagree	0 Strongly Disagree	Scaled Average
1	10	5	3	2	0	2.38
2	8	6	3	2	1	2.22
3	8	5	4	2	1	2.15
4	8	6	4	2	0	2.24
5	6	6	6	0	2	2.03
6	7	5	7	1	0	2.18

Table 14. Mapping of CLOs' to Program SLOs' Using Average EAMU Scores (In direct Assessment)

CLO#	Program Learning Outcomes				
	a	b	c	d	e
1					
2			2.22		
3		2.15			
4			2.24		
5		2.03			
6					
Average		2.09	2.23		

Proposed Action for Course Improvement

Assessment of the course shows that students are a bit weak in applying mathematical tools to the economic concepts, it is therefore recommended to give practice questions and tasks.

Conclusion

In this paper, we have performed the assessment of an undergraduate economics course using the FCAR. It is observed that on cohort level, students were unable to attain program SLOs' b and c. This may be due to the fact that students went through this type of rigorous activity for the first time.

Assessment based on OBE system has highlighted the deficiencies in the course. Assessment has also highlighted the inherent structural issues in the traditional teacher centric system. Based on evidence presented in this

paper, we ask the HEC Pakistan to switch to the OBE system to be compatible to the rest of the developed world.

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