



Pune District Education Association's
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Programme Outcomes
Quantification

Introduction:

Demand for quality of education and employable human resource is continually increasing globally. Outcome-based education (OBE) keeps learner at the center of the education system and it emphasis on skill and knowledge oriented development of the learner. It has been always promoted to bridge the 'academic- industry/market gap' and enables better employment prospects for graduates. It has been emphasized to build curriculum to improve not only the academic skills but also the soft-skills to the graduates, which in-turn can increase the employability of graduates. By imbibing the outcome based education, the institutions can meet the global standards and get recognition. Considering this scenario of the education system the IQAC has taken a step forward for the implementation of the outcome based education.

Learning Outcomes:

Learning outcomes are an essential part of any unit outline. A learning outcome is a clear statement of what a learner is expected to be able to do, know about and /or value at the completion of a unit of study, and how well they should be expected to achieve those outcomes. It states both the substance of learning and how its attainment is to be demonstrated. Learning outcomes not only serve the purpose of directing the content and design of a unit of study, they form the basis of assessment and are also linked to the larger outcomes of learning in the form of generic and/or course/discipline-specific graduate attributes. Because of their clear linkage to assessment, students will achieve the learning outcomes to differing degrees.

For faculty members: It is useful as follows

- To know the content of teaching
- To use the teaching strategies
- To set the sorts of learning activities / tasks for your students
- To set appropriate assessment tasks
- The course evaluation.

For the students:

The set of learning out comes provides them with:

- A solid frame work to guide their studies and assist them to prepare for the assessment
- A point of articulation with graduate attributes at course and / or university (i.e. generic) level.

The institute has stated the program outcomes (POs), program specific outcomes (PSOs), course outcomes (COs) as follows:

Course Outcomes:

It will state the capabilities the students will acquire after completion of the course. The statements must be clear and written based on Bloom's taxonomy.

At least 3-8 outcomes must be stated. The outcomes must be attainable and measurable.

Every subject teacher has to formulate the outcomes with the help of head of the department and senior colleagues.

The following table provides a quick reference to Bloom's Taxonomy, relating his categories in the cognitive domain to a simplified list appropriate to the higher education environment.

Bloom's six cognitive levels	Levels of learning
Knowledge (lowest level)	Knowledge
Comprehension	Comprehension
Application	Application
Analysis	Critical Thinking
Synthesis	
Evaluation(highest level)	

Program Outcomes:

- It will state the capabilities that student can acquire after completion of his/her degree(UG/PG).
- This can include the knowledge and skills.
- The head of the department/ faculty in charge has to write the outcomes with the help of senior faculty and get reviewed by the IQAC.

Program Specific Outcomes:

It will state the discipline specific capabilities the student can acquire after completion of his / her degree (UG / PG) e.g. Capabilities / technical skills.

This includes the generic capabilities and skill sets related to their specialization.

The head of the department has to write the outcomes with help of senior faculty and get reviewed by the IQAC.

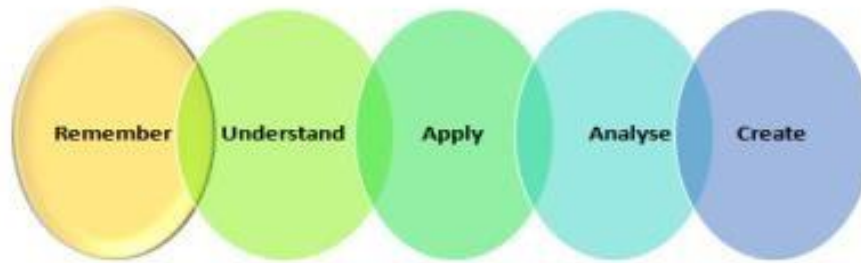
Writing learning outcomes statements:

Learning outcomes need to be specific and measurable.

Learning outcomes are generally written based on Bloom's Taxonomy.

Bloom's Taxonomy explains the process of learning and hence has proved to be a powerful tool to help develop learning outcomes.

Concept in writing learning outcomes



Points to consider while preparing learning outcomes



Learning outcomes should be based on the following factors:

- **Knowledge** - Knowledge about the subject, familiarity, awareness or understanding of the subject, such as facts, information, descriptions, or skills, which is acquired through experience or education by discovering or learning.
- **Cognitive** – Intellectual skills, should include how to apply knowledge to actions, should include problem solving skills.
- **Practical** – How to design and carry out experiments?
- **Generic Skills** - Generic skills include problem solving techniques, keys to learning.

Here are some guidelines to help the teachers in writing learning outcome statements:

- Consider the student's perspective when writing learning outcomes and stress on what should the student be able to know, do at the end of this unit that they could not do at the beginning.
- The learning outcome statements must start with an action verb. For cognitive outcomes use verbs that go beyond knowledge and comprehension that is students will be able to evaluate, analyze, synthesize and critique. The use of these verbs ensures that the learning is measurable.
- There may be some more appropriate, discipline-specific action verbs as well.
- Try to keep to one distinct learning outcome per statement, unless they are closely related.
- An outcome statement should capture in an integrated way the abilities, skills, attitudes and/or values that will demonstrate the attainment of that outcome.
- It is very important to reflect the objectives of syllabus, graduation attributes, vision and mission of the institute while writing the outcomes.
- The learning outcomes must be linked with the teaching strategies.

Attainment of COs, POs and PSOs

The process of attainment of COs, POs and PSOs starts from writing appropriate COs for each course of the program from first year to last year in UG/PG degree program. The course outcomes are written by the respective

subject teacher using action verbs of learning levels suggested by Bloom and Anderson.

Then, a correlation (Mapping matrix) is established between COs, PSOs and POs in the scale of 1 to 3, 1 being the slight (low), 2 being moderate (medium) and 3 being substantial (high).

A mapping matrix is prepared in this regard for every course in the program. The course outcomes written and their mapping with POs/PSOs are reviewed frequently by a head of departments before they are finalized.

From the mapping matrix of COs and POs/PSOs for all the courses as above, a ‘Program level course-PO/PSO matrix’ of all the courses including first year courses is prepared. Table below shows ‘Course-PO/PSO’ mapping matrix.

Program level Course-PO / PSO matrix for all the courses in the said programme

Table: Program level Course-PO / PSO matrix

[illegible]

Attainment of Course Outcomes (COs):

Assessment tools of COs and weightage as follows:

Sr. No.	Assessment Tools	Weightage
	B. Pharm.	
1	CO attainment of all theory courses Internal examination: 1) Continuous assessment (10%) and 2) Sessional examination (15%)	25%
2	CO attainment of all practical courses Internal examination: 3) Continuous assessment (05%) and Sessional examination (10%)	15%
3	CO attainment of all theory courses End semester examination	75%
4	CO attainment of all practical courses End semester examination	35%
	M. Pharm. (Sem.-I/II)	
5	CO attainment of all theory courses Internal examination: 1) Continuous assessment (10%) and 2) Sessional examination (15%)	25%
6	CO attainment of all practical courses Internal examination: 1) Continuous assessment (20%) and 2) Sessional examination (30%)	50%
7	CO attainment of all theory courses End semester examination	75%
8	CO attainment of all practical courses End semester examination	100%
	M. Pharm. (Sem.-III/IV)	
9	Journal club	5%
10	Presentation	14%
11	Research work	81%

Attainment Calculations of course outcomes (COs) of Theory Courses

Calculations for attainment level:

To define target level:

Sr. No.	Criteria for target level	Attainment Level	Target
1	25% students scored (10% for F. Y. B. Pharm.) >65% marks (25/100x3)	3	0.75 (0.3)
2	65% students scored (40% for F. Y. B. Pharm.) 55-65% marks (65/100x2)	2	1.3 (0.8)
3	10% students scored (50% for F. Y. B. Pharm.) <55% marks (10/100x1)	1	0.1 (0.5)
			2.15 (1.6 for F. Y. B. Pharm.)

Result analysis:

Sr. No.	Criteria for target level	No. of students	
		Internal Exam.	University Exam.
1	25% students scored >65% marks (25/100x3)	A	a
2	65% students scored 55-65% marks (65/100x2)	B	b
3	10% students scored <55% marks (10/100x1)	C	c
Total students		A + B + C = D	a + b + c = e

Calculation for attainment:**Internal Examination**

Sr. No.	Attainment	
	Internal Examination	University Examination
1	$A / D \times 3 = X$	$a / e \times 3 = x$
2	$B / D \times 2 = Y$	$b / e \times 2 = y$
3	$C / D \times 1 = Z$	$c / e \times 1 = z$
Attainment	$X + Y + Z = K$	$x + y + z = k$
% attainment	$K / 2.15 \times 100 = M \%$	$k / 2.15 \times 100 = m\%$
Final attainment	$25/100 \times K + 75/100 \times k = \text{Final CO attainment}$	

Attainment Calculations of course outcomes (COs) of Practical Courses

Calculations for attainment level:

To define target level:

Sr. No.	Criteria for target level	Attainment Level	Target
1	25% students scored (10% for F. Y. B. Pharm.) >65% marks (25/100x3)	3	0.75 (0.3)
2	65% students scored (40% for F. Y. B. Pharm.) 55-65% marks (65/100x2)	2	1.3 (0.8)
3	10% students scored (50% for F. Y. B. Pharm.) <55% marks (10/100x1)	1	0.1 (0.5)
			2.15 (1.6 for F. Y. B. Pharm.)

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	Internal Examination	University Examination
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2	$B / D \times 2 = Y$	$b / e \times 2 = y$
3	$C / D \times 1 = Z$	$c / e \times 1 = z$
Attainment	$X + Y + Z = K$	$x + y + z = k$
% attainment	$K / 2.15 \times 100 = M \%$	$k / 2.15 \times 100 = m\%$
Final attainment	$15/100 \times K + 35/100 \times k = \text{Final CO attainment}$	

PO and PSOs attainment calculations

Formula for calculating POs and PSOs attainment:

The PO/PSO attainment is calculated by using the predefined CO/PO; CO/PSO matrix and Final CO attainment of the course.

The PO/PSO attainment values are calculated using the following formula

$$\text{PO /PSO attainment} = \text{PO/PSO score} / 3 \times \text{Final CO attainment of the course}$$

Thus find the attainment values for all POS and PSOs for all courses and finally calculate the average POs and PSOs attainment values.

Reference:

- 1) The University of Queensland guidelines for outcomes.
- 2) Measuring Attainment of Course Outcomes and Program Outcomes – A Simplified Approach as per Self-Assessment Report -June 2015 Article in International Journal of Research & Method in Education · August 2016DOI: 10.9790/7388-0604041318
- 3) Linking Learning Outcomes to Teaching and Learning Activities and to Assessment Presentation 3 23 May 2017 Erasmus+ LOAF Project, Vilnius, Lithuania Dr Declan Kennedy, Department of Education, University College Cork, Ireland. Importance and Benefits of Learning Outcomes, Mrunal Mahajan and Manvinder Kaur Sarjit Singh, IOSR Journal Of Humanities And Social Science (IOSR-JHSS, Volume 22, Issue 3, Ver. V (March. 2017) PP 65-67.
- 4) Importance and Benefits of Learning Outcomes, Mrunal Mahajan and Manvinder Kaur Sarjit Singh, IOSR Journal Of Humanities And Social Science (IOSR-JHSS, Volume 22, Issue 3, Ver. V (March. 2017) PP 65-67.