ANALYSIS OF PROGRAMME OUTCOME AND COURSE OUTCOME

BACHELOR OF PHYSIOTHERAPY

Program outcome and Course outcome analysis

Introduction:

Quality assurance is a key factor in education. This require analysis of Program Outcome (PO) and Course Outcome (CO) mapping. This analysis is an important steps in outcome based education .As Physiotherapy education is moving from traditional teaching learning process to innovative method of teaching and learning, this need to be incorporated in to the evaluation system . Besides analysing the mapping, to make it more objective a score need to be obtained for mapping and attainment score need to be calculated for each course and program .All these analysis help to monitor not only the performance of the program but also the individual students. This type of analysis is not routine in health care education.

Terminologies

Program educational objective (PEO)

Program Educational Objectives are broad statements that describe what graduates are expected to attain within few years of completing their program. These are based on the needs of the society as analysed and outlined by the regulatory bodies.

Program Outcome (PO):

Program outcomes represent broad statements that incorporate many areas of inter-related knowledge and skills developed over the duration of the program through a wide range of courses and experiences. They represent the big picture, describe broad aspects of knowledge, skill and attitude development, and encompass multiple learning experiences.

Course Outcomes (CO):

Course outcomes describe the learning that will take place across the curriculum through concise statements, made in specific and measurable terms, of what students will know and/or be able to do as the result of having successfully completed a course.
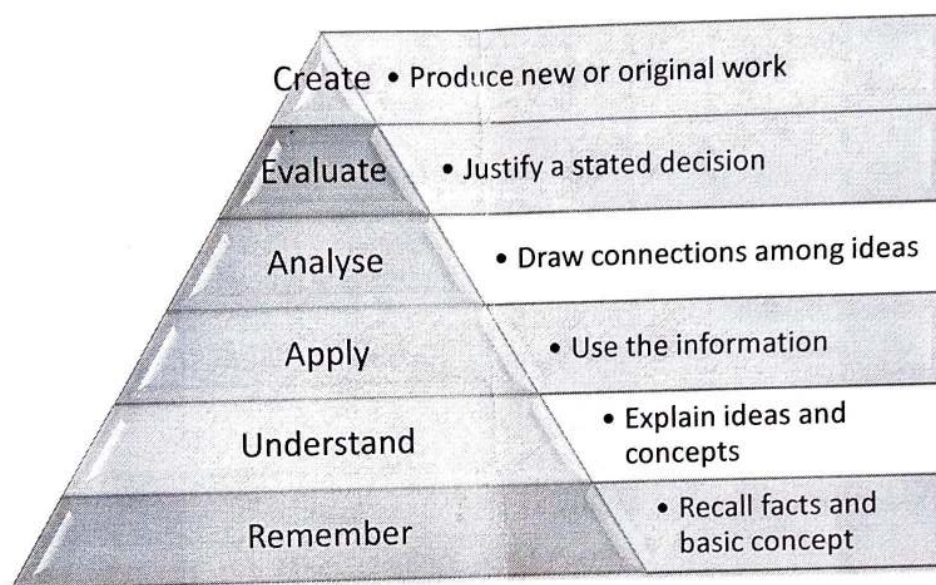
Mapping of PEO, PO and the CO:

Mapping (program mapping) facilitates the alignment of course-level outcomes with program outcomes. It allows faculty to create a visual map of a program. It is also used to explore how students are meeting program-level outcomes at the course level. Outcomes mapping focuses on student learning also.

Attainment score or level :

Attainment score or level is defined as a measure of a student's achievement in school which compares every child to a standardised expectation for their level, regardless of individual starting points.

Bloom's Taxonomy:

Bloom's Taxonomy of Learning Domains was created in 1956 under the leadership of educational psychologist Dr. Benjamin Bloom in order to promote higher order of thinking in education. It is most often used when designing educational, training, and learning processes. The three Domains of Learning are (1) Cognitive: Mental Skills (Knowledge), (2) Affective: growth in feelings or emotional areas (attitude or self) and (3) Psychomotor: manual or physical skills (skills). **(Figure 1)**

Create • Produce new or original work

Evaluate • Justify a stated decision

Analyse • Draw connections among ideas

Apply • Use the information

Understand • Explain ideas and concepts

Remember • Recall facts and basic concept

Figure. 1 Bloom's taxonomy

Department of Physiotherapy, MGMCRI is affiliated to Sir Balaji Vidyapeeth, a health sciences university of Puducherry. It has provided the syllabus for various health care courses, where all courses have its own objectives and methodology to achieve the course outcomes. To attain the course outcomes and program outcome, the institutes use course wise marks of students and the pass percentage of the summative assessment .

A. UNDER GRADUATE

1. Bachelor of Physiotherapy (BPT)

Program Educational Objectives (PEO)

Program educational objectives for under graduate program are as follows:

1. **PEO1:** Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes.

2. **PEO 2:** Be able to conduct the patient evaluation and assessment as per condition. & Establish a physiotherapy diagnosis and prognosis.

3. **PEO 3:** Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan

4. **PEO 4:** Able to Implements interventions and Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises and can Advise patient on appropriate nutrition, exercises, rest, relaxation & other issues

5. **PEO 5:** Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication and maintains inter professional relationships, which foster effective client-centered collaboration.

6. **PEO 6:** Be able to review the literature and can suggest implementation of research findings.

Program outcome (PO)

At the end of the 4 $^{1/2}$ year Program, Physiotherapy Graduates Should be able to

PO1. Demonstrate knowledge of the theoretical basis of physical therapy.

PO 2. Demonstrate clinical competency in evaluation, treatment planning and implementation.

PO3. Integrate knowledge of basic sciences and physical in order to modify treatment approaches that reflect the breadth and scope of physical therapy practice.

PO4. Integrate the use of basic principles of research in critical analysis of concepts and findings generated by self and others.

PO 5. Actively recognize the rights and dignity of individuals in planning and administering programs of care.

PO 6. Identify with and contribute to the aims and ideas of the profession.

PO 7. Function as competent physical therapist in any healthcare setting.

PO 8. Demonstrate command of knowledge which is necessary to function as an independent problem solver and learner in the practice environment.

PO 9. Demonstrate skills in teaching individuals and groups and able to incorporate the latest trends and technology in providing health care in all settings

PO 10. Conduct need based research studies in various settings and utilize the research findings to improve the quality of care.

Course(Cs)

BPT program consists of Following courses.

1st Semester BPT consists of Anatomy-I, Physiology-I, Biochemistry, Psychology & Sociology, Introduction to Healthcare delivery system in India, English & Communication Skills, Orientation in Physiotherapy.

2nd Semester BPT consists of Anatomy-II, Physiology-II, Exercise therapy-I, exercise physiology, introduction to quality and patient safety, biomedical, control, etc. first aid and emergency nursing.

3rd Semester BPT consists of Exercise therapy - II, Kinesiology-I, Electrotherapy-I, Pathology, Microbiology and Pharmacology. Environmental science, Natural Disaster Management.

4th Semester BPT consists of Kinesiology-II, Electrotherapy-II, General Medicine, Pediatrics, Psychiatry, Basic computer and informative sciences, colloboration in Physiotherapy practice.

5th Semester BPT consists of General surgery including Burns and Plastic surgery, Clinical Orthopedics & Traumatology, Clinical Obstetrics & gynecology and its Physiotherapy Management.

6th Semester BPT consists of Clinical Neurology & Neurosurgery, Clinical Cardiovascular & Respiratory conditions, Physiotherapy in Orthopedics & Sports, Medical/Physiotherapy Law & Ethics, Yoga in Physiotherapy, Ergonomics and Occupation Health.

7th Semester BPT consists of Physiotherapy in Neurology and Psychosomatic Disorder, Physiotherapy in Cardiovascular, Respiratory Conditions & Intensive care, Biostatistics & Research Methodology, Community Based Rehabilitation, Professionalism & Values, Diagnostic Imaging for Physiotherapist.

8th Semester BPT consists of Advanced Physical & functional diagnosis, Research Project, Bioengineering in Physiotherapy, Clinical reasoning and evidence base physiotherapy.

Choice Based Generic Elective courses Consists of : Basic science, Hospital laws, Hospital safety management, Behavioral science, Diet and nutrition, Health and wellness, Entrepreneurship in Physiotherapy, Leadership in Physiotherapy, Acupuncture, Diabetic Education, Integumentary Physical therapy.

Each course has its well defined course outcome mentioned in individual course book.
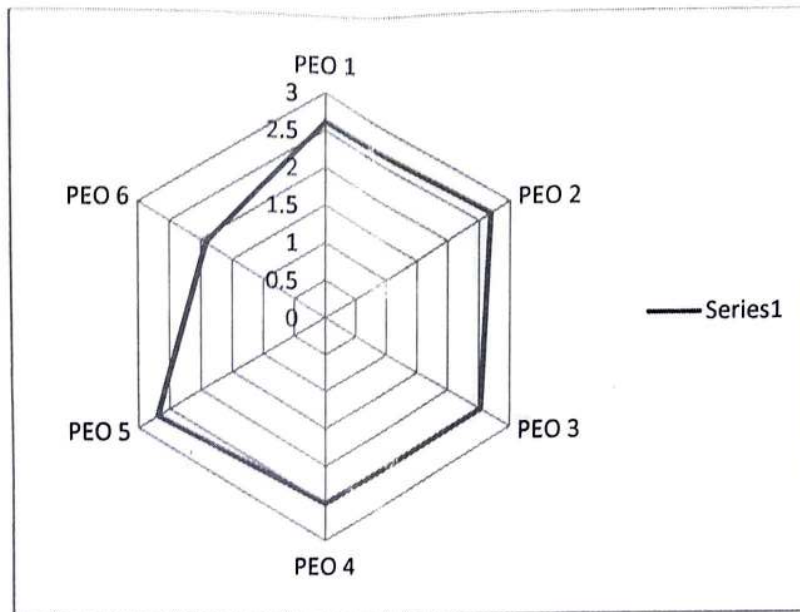
Mapping and analysis of Cs, POs and PEOs

The process of attainment of Cs, POs and PEOs starts from writing appropriate COs for each course in the four year degree program ,which include 1440 hrs of internship. COs and POs are defined in Model curriculum and Based on this , Course outcomes are refined by the respective faculty members of the course using action verbs of learning levels as suggested by Bloom Taxonomy . Then, a correlation is established between Cs and POs and Cs and PEOs on the scale of 0 to 3 ('0'being no correlation, 1 being the low correlation, 2 being medium correlation and 3 being high correlation) based on their perception. The average score is calculated and is correlated with the courses as a whole not individually .A 23x12 mapping matrix of COs-PEOs (Table.1) and 23 x5 mapping matrix of Cs-POs (Table.2) is prepared at the institute level in this regard for all courses in the program. Radar graph was plotted to find out the level of correlation between PEO-Cs (Fig.2) and PO-Cs (Fig.3).

Table 1. CO-PEO Mapping matrix

SL. NO	COURSE	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6
1.	Anatomy(AN)	2	2	1	1	2	1
2.	Physiology(PY)	2	2	1	1	2	1
3.	Biochemistry(BI)	2	2	1	1	2	1
4.	Psychology & Sociology	2	2	3	2	3	1
5.	ExerciseTherapy	3	3	3	3	3	1
6.	Exercise physiology	3	3	3	3	3	2
7.	Kinesiology	3	3	3	3	3	2
8.	ElectroTherapy	3	3	3	3	3	1

	Pathology, Microbiology and Pharmacology	2	2	1	1	2	1
10.	General Medicine, Pediatrics & Psychiatry	2	3	3	3	3	2
11.	General surgery including Burns and Plastic surgery	2	3	3	3	3	2
12.	Clinical Orthopedics & Traumatology	3	3	3	3	3	2
13.	Clinical Obstetrics & gynecology and its Physiotherapy Management	3	3	3	3	3	2
14.	Community Medicine	2	1	1	1	1	2
15.	Clinical Neurology & Neurosurgery	3	3	3	3	3	2
16.	Clinical Cardiovascular & Respiratory conditions	3	3	3	3	3	2
17.	Physiotherapy in Orthopedics & Sports	3	3	3	3	3	3
18.	Medical/Physiotherapy Law & Ethics	3	3	3	3	3	3
19.	Physiotherapy in Neurology and Psychosomatic Disorder	3	3	3	3	3	3
20.	Physiotherapy in Cardiovascular, Respiratory Conditions & Intensive care	3	3	3	3	3	2
21.	Biostatistics & Research Methodology	3	3	3	3	3	2
22.	Community Based Rehabilitation	3	3	3	3	3	2
23.	Advanced Physical & functional diagnosis	3	3	3	3	3	3
24.	Research Project	3	3	3	3	3	3
25.	Bioengineering in Physiotherapy	1	2	1	1	2	2
26.	Clinical reasoning and evidence base physiotherapy	3	3	3	3	3	3
	Average Score	**2.62**	**2.69**	**2.53**	**2.5**	**2.69**	**1.92**

Figure 2. Mapping of Program educational objectives & course
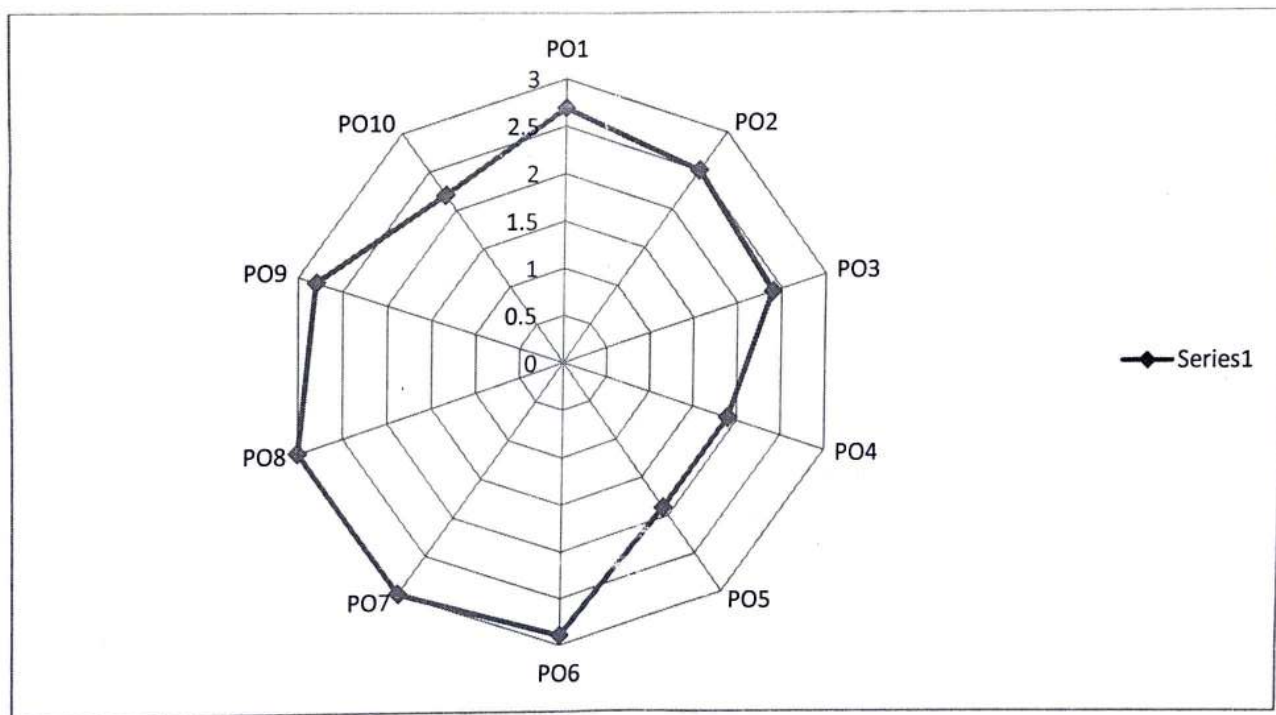(0 - no correlation; 1 - Low correlation; 2 - Medium correlation ;3 - High correlation)

Table 2. Cs-PO Mapping matrix

Sl. No.	Course	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
1.	Anatomy(AN)	3	3	2	1	1	3	3	3	3	2
2.	Physiology(PY)	3	3	2	1	1	3	3	3	3	2
3.	Biochemistry(BI)	3	3	2	1	1	3	3	3	3	2
4.	Psychology & Sociology	3	3	2	1	1	3	3	3	3	2
5.	ExerciseTherapy	3	3	3	2	2	3	3	3	3	2
6.	Exercise physiology	3	3	3	2	2	3	3	3	3	2
7.	Kinesiology	3	3	3	2	2	3	3	3	3	2
8.	ElectroTherapy	3	3	3	2	2	3	3	3	3	2
9.	Pathology, Microbiology and Pharmacology	3	3	2	1	1	3	3	3	3	2
10.	General Medicine, Pediatrics & Psychiatry	3	3	2	1	1	3	3	3	3	2
11.	General surgery including Burns and Plastic surgery	3	3	2	1	2	3	3	3	3	2
12.	Clinical Orthopedics & Traumatology	3	3	3	2	2	3	3	3	3	2
13.	Clinical Obstetrics & gynecology and its Physiotherapy Management	3	3	3	2	2	3	3	3	3	3
14.	Community Medicine	1	1	1	1	2	2	3	3	1	2
15.	Clinical Neurology & Neurosurgery	3	3	3	2	2	3	3	3	3	2
16.	Clinical Cardiovascular & Respiratory conditions	3	3	3	2	2	3	3	3	3	2
17.	Physiotherapy in Orthopedics & Sports	3	3	3	2	2	3	3	3	3	2
18.	Medical/Physiotherapy Law & Ethics	1	1	1	2	3	3	3	3	3	1
19.	Physiotherapy in Neurology and Psychosomatic Disorder	3	3	3	2	3	3	3	3	3	2
20.	Physiotherapy in Cardiovascular, Respiratory Conditions & Intensive care	3	3	3	2	3	3	3	3	3	2
21.	Biostatistics & Research Methodology	3	3	2	3	3	3	3	3	3	3

No.	Course										
22.	Community Based Rehabilitation	3	1	3	2	1	3	3	3	2	3
23.	Advanced Physical & functional diagnosis	3	3	3	3	2	3	3	3	3	3
24.	Research Project	1	1	3	3	2	3	3	3	3	3
25.	Bioengineering in Physiotherapy	1	1	1	2	1	3	3	3	1	2
26.	Clinical reasoning and evidence base physiotherapy	2	2	2	3	3	3	3	3	3	3
Average Score		2.69	2.5	2.4	1.9	1.9	2.9	3	3	2.8	2.2

(0 - No correlation; 1 - Low correlation; 2 - Medium correlation ;3 - High correlation).
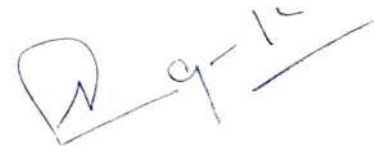

Figure 3. Mapping of Program outcome & course

(0 - No correlation; 1 - Low correlation; 2 - Medium correlation ;3 - High correlation)

Analysis of Cs, POs and PEOs:

On analysing, the average score of individual program outcome ranges from 1.9 to 3. It shows, there exist a strong correlation of all Cs with that of PO1 & PO10, whereas medium correlation between Cs and PO4, PO5, PO10. Similarly, on analysing, the average score of individual program educational objectives ranges from 1.9 to 3. It shows, there exist a strong correlation of all Cs with that of PEO1 to PEO5 whereas medium correlation between Cs and PEO 6.

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