Outcome-Based Education : An Avalanche

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Abstract: *William G. Spady (1991) has developed Outcome- Based Education with three basic premises: All students can learn and succeed each with a unique level that breeds and controls the success of the academy. Just like learning to ride a bicycle, outcome-based education is a learner-centered measurable approach to develop professionally as well as life skills through active participatory learning. Unawareness about the learning concept, inadequate training for the teachers, and irresponsibility among the students with learning to ruin the whole education system. This paper analyses the acquaintance of result-oriented education using a survey method and Tableau software visualizes the results of the survey. By providing proper training and making awareness can attain a better learning outcome.*

Key Words: *course outcome, programme education objective, programme outcome, programme specific outcome, graduate attributes.*

1. INTRODUCTION:

Education is the backbone of the progress of any person or nation or world and brings social uplifting too. The purpose of education is to make a person broad-minded, to eradicate poverty, to discard the caste and gender discrimination to bring newer inventions, and to give enthusiasm. In the globalization era, it is mandatory to shift the conventional/traditional education system and to adapt to the current scenario for the success of the education system. The education system will be successful if it provides lifelong learning opportunities and learning by doing chances.

1.1 Teaching and Learning:

In the education system, learning is the process by action of teaching. Teaching is a process of imparting instructions to learners with three key elements which include focus (clear in saying), knowledge in the subject, and engaging people in learning. Teaching has three phases: curriculum planning phase, an instructing phase, and an evaluating phase. Teaching in the form of questioning, explaining, demonstrating, and facilitate the learning activities such as assignment writing, discussion, and practice. Learning is a process that starts from memorizing by reading books, acquiring knowledge/ information by seeing, making sense with hearing, ready to comprehend what we see and hear and finally reinterpreting knowledge by doing/creating. Learning is a product that increases the knowledge quantitatively by attaining the desired outcome. The present-day education system does not meet the student's expectations of the success of their life and works. It is mandatory to adapt to the lively changes in the industrial revolution for the success of education. All over the world, India had an exclusively high-quality education during ancient times. The education system in India has been divided into two parts: before independence and after independence. The three phases of the education system before independence are the Ancient period (1500 – 500 BC), Medieval period (500 – 1500 AD) and Modern period (Pre-modern period 1500 – 1757 & British Colonial period 1757 – 1947). The modern education system was introduced by Lord Thomas Babington Macaulay (1830) during British rule. The syllabus was limited to science, mathematics, language, history, geography, and civics. The mode of teaching was confined to a classroom inside the building.

Most of the teachers have paid their attention to teaching rather than student's learning. In the ever-evolving technology era, the traditional education system is losing its significance in the quality of education. The teacher-centered or curriculum centered approach focuses on transmitting information from the teacher to the student and not considering for the training in the student's profession. The aim of education for learners should be the success of their careers after completion of education globally. In this way, achieving outcomes put more concentration compared to the vacuum content. By introducing outcome-based education (OBE), people who were left behind for further learning or employment, will be able to see more opportunities to put themselves in a career track to lead a successful life.

2. LITERATURE REVIEW:

Nakkeeran[6] et al (2018) have pointed out that the level of educator's understating of OBE is still very low and. educators should understand the OBE system for the successful implementation of OBE. Gomathy [3] has initiated that to make awareness about the employability skills among Indian students is mandatory and regular updating of the curriculum will outfit to the needs of the industry. Jane Iloanya [4] has recommended that there is a need for teacher

education and training around curriculum design, instruction, and assessment. He also has pointed out that empowering the students to demonstrate knowledge, skills, and competences is the role of the teacher, and the institutions should recognize and honor the best teachers for the successful implementation of OBE principles.

Jonathan V. Macayan [5] has concluded that outcome-based assessment should encourage the reshaping of the various levels of outcomes and the rethinking of teaching and learning and assessment tasks to ultimately prepare students not only for academic success but also for life success. Fanta, F., & Boubacar, I. (2016) [2] have determined that activity-based teaching enriches the students as compared to lecturing and the results of the study keep support active-based teaching effectively over the conventional approach.

Wang Lixun [8] has represented that some contradictory views about the differences between the conventional approach and the OBE approach. Students can see the difference between the conventional approach and the OBE approach whereas teachers did not make many changes in the actual way of teaching. Rohaila Yusof [7] has proved that courses like accounting which is highly related to business and corporate world, is necessary to produce graduates with a high level of practical competence. Borsoto, L.D. et al [1] have proposed that Outcome-Based education is useful in terms of academics, attitude, and instructions. There is a significant relationship between the status of OBE implementation and the level of use of outcome-based education.

The present environment does not assess the knowledge level of the students considering irrespective of learning capacities. Outcome-based education, a learner-centered approach puts forth a radical move that motivates the teacher to enhance teaching style and encourages learners by active participation.

3. OUTCOME-BASED EDUCATION:
3.1 Bloom's Taxonomy:
In 1956, Dr. Benjamin Bloom (psychologist) and a committee of educational professionals derived up with three taxonomies (cognitive, affective, and psychomotor) for enhancing the learning skills of a student. Bloom's Taxonomy a tool used for accessing the student's knowledge level as well as learning outcomes (i.e. Student's capability and demonstration of ability). The action word or verb is used to write the statement of the outcome. Vibrant understanding of knowledge level (remembering, understanding, applying, analyzing, evaluating, and creating) and action verb help in the framing of the key components of OBE. Lorin W. Anderson has written about the taxonomy for learning, teaching and assessment in the revision of Bloom's taxonomy framework simplifies the investigation of curriculums in four aspects: "what is planned to be taught, how it is to be taught, how learning is to be assessed, and how well the intended objectives, instruction, and assessments are aligned for effective education".

3.2 Outcome-Based Education Framework:
OBE is an instructive method which is based on trying to achieve certain specified outcomes in terms of individual student learning. Figure 3.1 presents the framework of OBE. The three components that encompass an outcome-based approach to learning are:
- *Learning purpose* stated in an explicit/clear format, as outcomes which in turn should mirror educational aims, resolutions, and values; (What is taught?)
- *the method or approach* to empower the intended learning to be achieved and demonstrated (curriculum, teaching, learning, assessment and support, and guidance methods); (How achieved?)
- *criteria* (standards, measures, and procedures) for assessing learning which is aligned to the intended outcome. (It is the qualitative measures of "What is taught and How achieved?".)

3.3 Key Terminologies of Outcome-Based Education:
- **Course (paper/subject studied in the programme)** is defined as a theory, practical or theory combined with practical subject studied in a semester. For example, Environmental studies – theory subject.
- **Course Outcome (CO)** Course outcomes are simple statements that define important and crucial learning that learners have attained, and can demonstrate at the end of a course dependably. Generally, three or more course outcomes may be specified for each course based on its weightage. While writing COs Bloom's Taxonomy action verb and levels are taken into consideration.
- **Programme** is defined as the specialization or discipline of a Degree. It is the interconnected arrangement of courses, co-curricular, and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree. For example, B.Sc., Computer Science.
- **Programme Outcomes (POs)** Programme outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes. Washington Accord has specified 12 graduate attributes given below as POs of engineering programs. BAETE has adopted those POs. In the syllabus book, there should be a clear mention of course objectives and course outcomes along with the CO-PO course articulation matrix for all the courses.
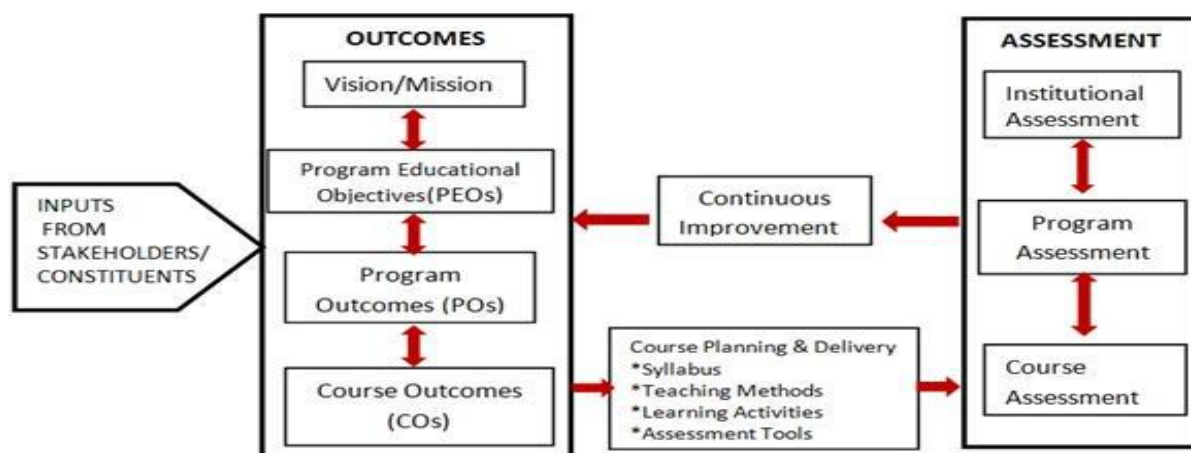
Figure 1. OBE Framework

- **Programme Educational Objectives (PEOs)** The Programme Educational Objectives of a program are the statements that describe the expected achievements of graduates in their careers, and principally what the graduates are expected to perform and achieve during the first few years after graduation.

- **Programme Specific Outcomes (PSO)** Programme Specific Outcomes are what the students should be able to do at the time of graduation with reference to a specific discipline

- **Graduate Attributes (GA):** All graduates of any higher education programs are expected to have identified technical/ functional, generic, and managerial competencies. Graduate Attributes are the competencies that a graduate of a program should have. The twelve graduate attributes are exemplars of the attributes expected of a graduate from an accredited program as stated by the NBA are in the spirit of Program Outcomes as stated in Washington Accord.

3.4 Phases in Outcome-Based Education:

In an OBE system, there are three major steps in instructional planning: Define the content related to learning outcomes that students are able to complete (curriculum); Determine how to support students to achieve those outcomes (teaching and learning practices); and How to determine when the students have achieved the outcomes (assessment and reporting procedures).Outcome-based education is a bottom-up approach that focuses on learning outcomes with high expectations and expanded opportunities. The major pitfalls of outcome-based education are instructor's facing challenges and assessment procedures.

4. TEACHING AND LEARNING STRATEGIES:

In OBE, learning outcomes are formulated by the teachers to guide them in determining what would be expected from the learner at the end of the lesson. Attempts are made to encapsulate learning outcomes with knowledge, skills, attitudes, and values that match the immediate social, economic, and cultural environment of the society. After providing adequate training to the teachers; the OBE can be implemented successfully for its effective use. Quality teacher education is needed right from the moment student teachers are admitted to the program through to the period when they graduate and are ready to face the practical realities of the profession. Teachers are expected to understand many issues surrounding how learners learn, know how to teach effectively to ensure that learning takes place, and, in this case, master aspects of pedagogical content knowledge that incorporate language, culture, and community contexts for learning. Outcome-Based Education requires that learners be empowered to learn at their own pace and according to their capabilities. Hence, the responsibility of teachers is to know and understand the spirit of every child, how they each learn, and to be able to nurture that style of learning. The teacher's role is to facilitate teaching and learning in such a way that learners can demonstrate competences and understanding of what they have learned. Teachers should be equipped with the knowledge, skills, and competencies through all stages of preparation and professional development practices for their success. The 21st teacher education program should be geared towards helping teachers develop the knowledge and skills applicable to current practice. Teachers have to be willing to update or adapt to the upcoming technology.

4.1 Implications to Learning Assessment Practices:

Assessment plays an important role in the educative process. It serves as a basis for determining the rate of learning progress of students as well as the source of information of opportunities for further improvement. Assessment is classified into formative assessment and summative assessment. Formative assessment is carried out daily, weekly, or monthly by questionnaire (quiz), assignments, seminar, group discussion. A summative assessment is carried out at the end of the semester. The implementation of OBE in the institution level would involve the restructuring of relevant

systems and procedures to constructively facilitate the attainment of the desired outcomes of education. Assessment methods should be authentic and should provide opportunities for students to demonstrate what they know and what they can do with their knowledge. Proper implementation of OBE both in the classroom and institutional levels would demand paradigm shifts such as teacher-centered to learner-centered approach and be outcomes-minded.

5. EXPERIMENTAL STUDY:

The study is descriptive in nature. The population for the present study was stakeholders of OBE (faculty, students, industrialist, alumni) from higher education institutions in the state of Tamil Nadu. Convenience sampling was used to collect the data through a structured close-ended questionnaire. The questionnaire** framed consisted of 11 personal questions and 23 questions on various aspects of OBE concept like-curriculum (Q1-Q5), teaching and learning methods(Q6-Q10), assessment (Q11-Q13 questions are common, Q14, Q15 for faculty only & Q16, Q17 for student only), and feedback(Q18-Q22). The responses were measured on a 5-point Likert scale coded as 5 -Strongly agree, 4 - Agree,3 –No opinion,2 -Disagree,1-Strongly disagree. From the 149 responses, an assessment was done after eliminating duplicate entries with a sample of 97 faculty members, 3 industrialists, 8 alumni, and 41 students. The survey data has been analyzed using tableau software. Data interpretation and data visualization is more vital components of any research. Tableau is an efficient reporting tool especially for Likert scale surveys. Tableau helps in many ways by grouping and making graphs. Table 1 clearly represents the overall responses of the survey.

Table – 5.1: Overall responses (in %)

Q.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	2	5	3	3	0	3	3	1	1	3	4	5	4	1	1	1	1	0	1	3	3	2
2	3	5	10	5	7	5	6	3	7	5	7	15	5	11	6	1	2	7	7	9	5	9
3	19	18	14	15	30	7	12	14	11	13	15	19	23	8	14	6	4	11	13	18	12	20
4	45	44	51	42	45	48	45	39	41	44	44	36	36	23	28	8	11	50	44	38	42	40
5	31	28	21	35	17	36	34	42	40	35	30	25	32	21	17	11	10	32	35	32	38	30
1 – Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree																						

The findings of the study reveal that most of the respondents agree with the concept of OBE. The key components of curriculum, teaching & learning practices and assessment are interrelated in each stage. The well-defined content with good teaching and proper assessment accumulate enrichment in learner's future. Most of the respondents have quoted in the feedback about the improvements/changes in the curriculum and introducing innovative teaching methods like ICT, modernized teaching methods.

6. RECOMMENDATIONS:
These are the recommendations given for the successful implementation of OBE:
Before planning, teaching, and evaluation one should keep in mind the following simple questions:
- What do we want students to learn?
- Why do we want students to learn these things?
- How can we best help students to learn these things?
- How will we know when students have learned?

For the successful implementation of the OBE system, the following parameters are to be defined clearly with the help of feedback from industrial and professional bodies.
- ✓ **Institutional Requirements:**
- Clear vision and mission statement of the institution stating the core values, business values, and ethical values.
- Vision and mission statement should entrust the stakeholders and learning committee.
- ✓ **Programme Requirements:**
- With feedbacks from industrial and professional bodies to develop the curriculum for the particular course.
- Developing programme outcomes (PO).
- Mapping PO with institutions vision and mission.
- ✓ **Course outcomes**
- Refining curriculum with determining the order of courses and defining the prerequisite for each course.

- Developing course outcomes for each course.
- Setting a threshold for assessment for courses for determining course attainment.

✓ **Assessment:**

- Cleary defining the results to be measured.
- Identifying the data and resource availability and utilizing assessment related to the course.
- Each assessment should have a clear rubric which can imply how marks can be achieved.
- For example, an assignment was given to the students, the criteria needed to be clearly stated.
- For validating the marks, given marks are distributed criterion wise.
- When the marks are shown to the students after validating it, the students understand the area where they are lacking and can focus on that area to improve.

7. CONCLUSIONS:

The dynamic nature of the curriculum should be reviewed minimum once in a year and maximum once in three years. Teachers should possess a keen knowledge in the ultra-modern way of teaching methods. Assessment is the key to promote perfect outcome-based enhanced learning which results in finding the level of student performance. Practicing students in the pattern of bloom's taxonomy assist them in attaining the outcome of the course/programme.

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**The survey questions are enclosed in annexure.

ANNEXURE

Curriculum

1. OBE curriculum covers all the metrics regarding the programme.
2. OBE curriculum is easy to understand by the students. (ie. Course outcome, Programme outcome, and Program-specific outcome are well explained)
3. OBE curriculum reduce stress level.
4. OBE curriculum encourages the achievement of the outcomes.
5. Is OBE curriculum attain the outcomes?

Teaching and Learning Practices

6. The instructor stimulated the interest in the course or challenged the students to do their best work.
7. The instructor manages the classroom time and pace well.
8. The instructor organized and prepared well for the classes.
9. The instructor encourages group discussion, fieldwork, real-time situations, etc. and also responded.
10. The instructor makes and also appears enthusiastic and interested.

Assessment

11. The pattern of the question achieves the outcomes of the course.
12. Answering the question in the OBE pattern is easy compared to the traditional pattern.
13. OBE evaluates the student's performance clearly.
14. The question setting in the OBE method is easy. (Faculty only)
15. The mapping of student's performance is easy. (Faculty only)
16. The instructor explains the grading criteria of the course. (Student only)
17. I feel i am achieving the learning outcomes. (Student only)

Feedback

18. OBE used a variety of instructional methods to reach the course and programme objectives.
19. OBE gives depth knowledge in course as well as programme.
20. OBE evaluates the answer script and performance of the student accurately.
21. The course was supported by adequate resources like library, smart room, seminar, conferences, and outside the class.
22. OBE provides plenty of employment opportunities.