Survey: Designing Curriculum for Outcome Based Education

Nivedita Kasturi[1]

[1] B.V.B College of Engineering and Technology, Hubli.

Abstract: In the outcome based education system, universities focus on outcome of student's technical competence, professional skills. Due to Changes in the curriculum of outcome based education (OBE), this has been an on-going need to be addressed and practiced by the institution to consistently generate well groomed learners suitable for industry. The high demand of industry on their potential employees with good technical competence and professional skills continuously drive the need for change.[1] All curriculum and teaching decision are made based on desired outcome.

The main aim of this paper is survey stakeholders for building, refining and restructuring Program Educational Objectives in-line with Graduate Attributes. The graduate attributes are the things which need to be considered in outcome based education, these attributes need to be taken from the source which requires outputs of outcome based education. Those are IT industries, professional bodies etc. our survey system generates the templates for different stakeholders and when those stakeholders gives responses, it stores them and generates the reports from which the graduate attributes can be extracted and those becomes the Program objectives for outcome based education.

Index Terms

Outcome based Education(OBE),Survey tool, Design Curriculum, PEO-Program Educational Objectives ,PO- Program Outcome, CLO- Course Learning Objectives, TLO-Topic Learning Objectives

1. Introduction

Earlier all the educational institution use to focus on syllabus set by some experienced people or professional bodies in particular fields, but those type of curriculum didn't work well to provide the graduates with successful carrier in their professional life. The history of outcome based education

In traditional educational system students are given grades based on how much they score in the assessments conducted for what they are thought in classroom sessions. here some student score well and other score below average.

In this system this type of variation in scores of student is thought as normal and unavoidable.

Outcomes based education (OBE) is a process that involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than the accumulation of course credits" (Tucker, 2004). Thus the primary aim of OBE is to facilitate desired changes within the learners, by increasing knowledge, developing skills and/or positively influencing attitudes, values and judgment. OBE embodies the idea that the best way to learn is to first determine what needs to be achieved. Once the end goal (product or outcome) has been determined the strategies, processes, techniques, and other ways and means can be put into place to achieve the goal. [2]

Main task of institutions, if they want to follow OBE method for curriculum design then they need to know what are the different expectations of industry or employer outside the institution for hiring their students. Cudos (Curriculum Design for Outcome Based Education) -Survey is a tool which helps to get graduate attributes or PEO's (Program Educational Objectives) as its output.

In the current modern society almost every technical education tends to establish an *Outcome Based Education (OBE)* system. OBE is a method of *curriculum design* and teaching that focuses on what students *can actually do after* course completion. It identifies the real needs of Industry and society's and revision the curriculum to suit the changing needs of the Stakeholders (Industry, Alumni, Academia, Professional bodies).

Elements of Outcome Based Education (OBE)

1) Program Educational Objectives (PEO)
2) Program Outcomes(PO)
3) Course Learning Objectives (CLO)
4) Topic Learning Objectives (TLO)

Program Educational Objectives (PEO): Expected achievements of graduates within the first few years of their graduation from the program.
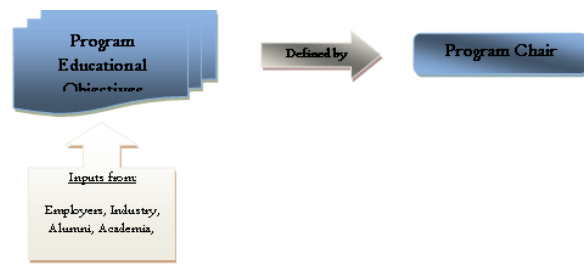

Fig1 Design process of Program Educational Objectives (PEO)

Above diagram specifies how the PEO's are generated from inputs of stakeholders and it is given to program chair who is the head of institution who wants to know the different graduate attributes.taking feedback from stakeholders and generations of PEO's for designing curriculum is done by cudos-survey system.

2. Roots of Outcome Based Education

An outcomes based approach to education dates back some 500 years to craft guilds of the Middle Ages in Europe in the form of apprenticeship training models and there are many examples still in place today (Spady, 1996).   Malan (2000) analyzed past educational reforms that influenced OBE and identified the following:.

2.1 Tyler's educational objectives

In 1950 Tyler identified fundamental issues important when developing and planning instruction, including purpose, content, organization and evaluation. He believed objectives were essential for systematic planning and identifying the required learner behaviour post instruction as well as the content and context to apply it within. His curriculum design approach continued to influence teaching for several decades and the basic philosophy for outcomes based design is rooted there (Arjun, 1998 cited in Malan, 2000)[6].

2.2 Bloom's mastery learning

Bloom taxonomies for educational objectives emerged in the 1950s and helped to determine whether learners had attained acceptable standards compared to desired learning outcomes. His mastery learning theory was based on the premise that with sufficient opportunities and support from an appropriate learning environment most learners are successful in their learning tasks. This notion is reflected in OBE. Other characteristics of mastery learning include:

➢ Ascertaining prerequisite knowledge or skills to attain goals (outcomes)
➢ A flexible timeframe to attain goals (outcomes)
➢ Using different media and materials to create enriched teaching/learning contexts
➢ Formative evaluation to provide feedback for both teaching and learning improvement

2.3 Competency based education

Competency based education was introduced in the 1960s in North America in response to growing concerns that students were not being taught what they required after they left school. Malan (2000) summarizes the following components from the competency based literature, noting their prominent in OBE[7]:
➢ Explicit learning outcomes with respect to the required skills and concomitant proficiency (standards for assessment)
➢ A flexible timeframe to master skills
➢ A variety of instructional activities to facilitate learning
➢ Criterion referenced testing of the required outcomes
➢ Certification based on demonstrated learning outcomes
➢ Adaptable programmes to ensure optimum learner guidance
➢ Support for the notion the learner is accountable for his or her own achievement

2.4 Glaser's criterion-referenced learning:

In 1963, Glaser described criterion-referenced measurement as that which locates a student's test behaviour on a continuum ranging from "no proficiency" to "perfect performance". Criterion-reference instruction and assessment is based on attaining specific outcomes and on testing for competence in terms of stated criterion. This form of instruction compares a learning outcome or mastery of competencies with a predetermined external standard. Success is measured by demonstration of standards followed by remedial intervention as required. Criterion-referenced assessment is the preferred mode of assessment in OBE.[9]

2.5 Spady's OBE

Spady's OBE approach closely resembles Mager's (1962) guidelines in terms of expected performance, conditions under which it is attained and standards for assessed quality. OBE learning programme assessment and learner's competence can be compared to specific criteria. Competence in the required outcome (learner behaviors) is demonstrated by culminated of significant learning within a context, and specific timeframe required by the individual learner.

3. Importance of Survey in Designing Curriculum For Outcome Based Education:

Designing curriculum for outcome based educationfor an institution with effective graduate attribute, need some tool which will help them to in deciding the graduate attributes for particular academic year.

Outcome based education prepares the student to be successful at the end of their learning experience. Institution doesn't think education for student as only lecture, assessment and projects. But they need to make student as a person who can survive in his professional life with learning he had got from institution.

Institution can make student successful only when they know what is that required for a student to be successful professional. For that they need to do as IT industries, professional bodies what are they expect from a graduate from an institution. Here comes the place for survey to know that information.

Lets consider "how the survey helps to decide on graduate attributes"? first we need to create a template which specifies the need of IT industry and professional bodies, template may consists of set of question which will be answered by stakeholders(person from IT Industry, professional bodies like IEEE). Based on responses given by the stakeholders the reports are generated to extract the graduate attributes.

All the reports generated from survey is stored and this stored information is the source of graduate attributes or program educational objectives(PEO's). these graduate attributes are taken as base for designing the curriculum and then it continuous in designing program objectives, course learning objectives (CLO's), topic learning objectives(TLO's).

4. Proposed Survey System For Designing Curriculum For Outcome Based Education:

The proposed system providing statistical data about the industry needs for designing the outcome based education.
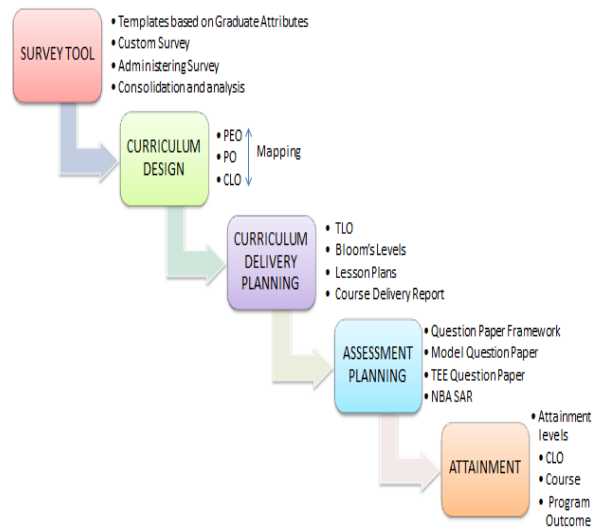

Fig.2: curriculum design Process in OBE

Above is the larger picture of CUDOS survey system. Survey tool is indicated as a component of the entire system.

The CUDOS survey consists of admin and program owner roles. Admin is person who create template for survey at the level of institution. program owner, who create and host the survey while creating the survey he selects program and stakeholder for survey. Next he selects the template, based on requirement at the department level he modifies the template which was created by admin.

After creation of survey program owner host the survey, here hosting the survey means mail will be sent to all selected stakeholder with a template. The stakeholder participates in survey by responding to survey by answering the questions in the template. All responses of stakeholder are collected and stored, using which survey report are generated. Survey reports are analyzed and parsed to extract for generating PEO's .

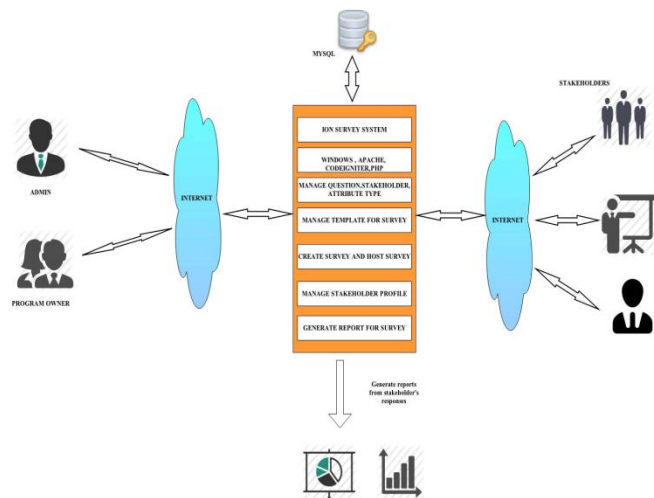Pictorial representation of above description is shown in Fig.3

Fig.3 Architecture For CUDOS-Survey

For doing survey we consider two type of templates, those are Fresh and Feedback. In survey Fresh templates are used for designing curriculum, Feedback templates are used for restructuring and refining curriculum in OBE.
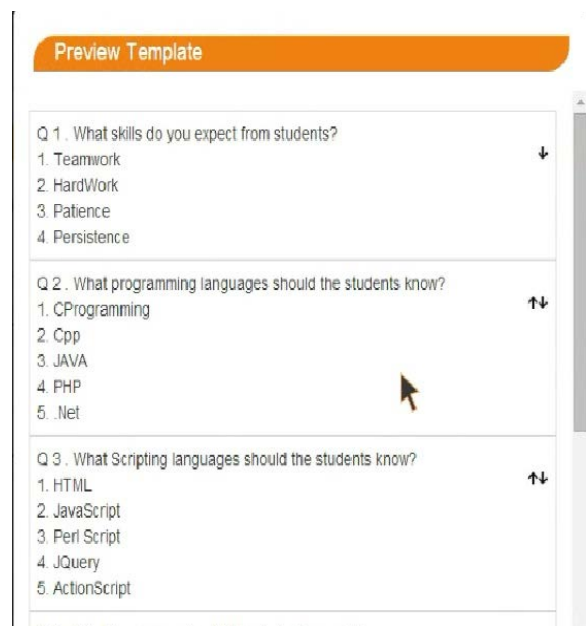

Fig.4 Survey Template Format

Fig.4 shows the format of template used in CUDOS-Survey.

Once the stakeholder get template, they respond to survey by giving the feedback. This feedback can be represented in graphical notation as shown in Fig.5.And stakeholder can give suggestion in term of description, using this description some of the important keyword can be extracted and can be used in forming the PEO's.
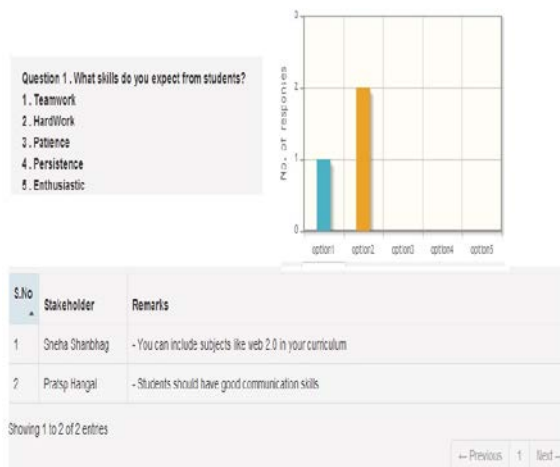

Fig.5 Survey Response and Suggestion

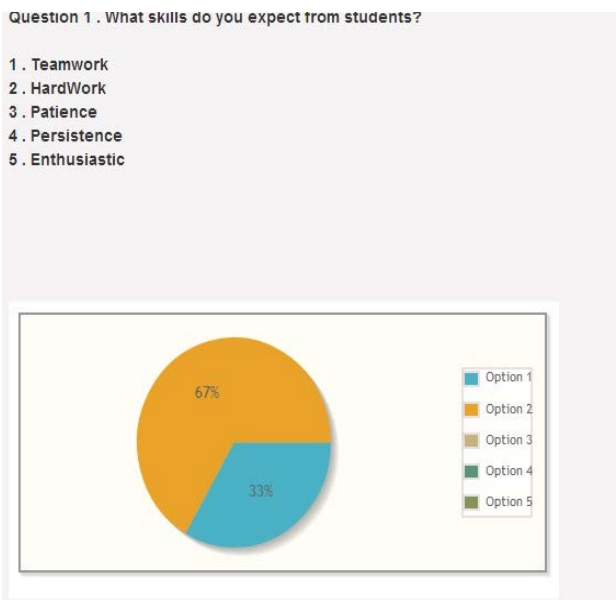Fig.5 and Fig.6 Explains how the response are mapped to graphical representation.

Fig.6 Survey Responses.

5. Conclusion

In this paper, we proposed survey model which generates the PEO's based on responses given by the stakeholder. Survey responses are patrician into fresh report and feedback report based on the requirement to restructure, refine and build new PEO's. The proposed CUDOS-Survey system is implemented with open source technology like PHP (CodeIgniter), MYSQL,

jQuery and JavaScript. The whole application flow is shown in Fig.3.In future we would like to add artificial intelligence to CUDOS-Survey, so that it removes all the manual work from existing system

7. References

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AUTHORS

First Author – Nivedita Kasturi, M-tech, BVBCET-Hubli and nk5883933@gmail.com.