

# FACULTY SURVEY CONDUCTED FOR DEVELOPING A SOFTWARE PACKAGE FOR OUTCOME BASED EDUCATION

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## Abstract

This paper examines the consumer requirements for an upcoming software product that aims to provide detailed reports based on Outcome Based Education for faculty and students in Engineering Colleges to help improve the student performance. A questionnaire survey was created with a goal to identify the needs of the faculty, who is the end user, and establish a fact base for justifying the product specification, develop a common understanding of the customer requirements among members of the development team and incorporated functionality specific to the needs of the end user. The alternatives were established for each functionality chosen to be implemented in the software and the best alternative was then selected.

**Keywords:** Outcome Based Education, Questionnaire Survey, Software Product

## Introduction

Management practices are the working methods the managers use to improve the effectiveness of the work system. From a very long time, especially in India, documentation in education systems has been maintained only on offline basis. In engineering colleges where there are around 10 to 12 departments and around 12 to 15 faculties, maintaining records of each individual of each batch and able to retrieve it when required is usually not an easy task. Also engineering colleges have made it mandatory for each faculty to prepare a Self-Assessment Report (SAR) at the end of semester. SAR is a report generated by the faculty based on the performance of the students in the course handled by the faculty. This report includes many calculations and also an attainment matrix of Course Outcomes and Program Outcomes. As observed, this Documentation task consumes lot of time and as it is offline, makes the routine task of faculties more tiresome. Due to which faculties are unable to focus on quality education and decrease the number of students who are scoring less. It is also seen that there are four categories of students:

- One who grabs the subject very fast
- One who is able to manage after teaching and studies
- One who finds it difficult to understand the subject
- One who is unable to understand the subject

The first two categories of student do not have much problem in understanding the subject. The last two categories of student are the one who needs continuous support to learn and apply. In order to improve student's performance, teaching - learning process should be made more effective. Hence we are developing a software package which will address the requirements of the faculty in completing their routine work. With the help of software, data

will be stored on cloud and most of documentation work will be made simpler. The software will also address the Indirect Assessment tools such as internships done, industrial training, Massive Open Online Course, industrial visits, research papers published, etc which help the students be industry ready. Therefore the software as a tool would help improve the system and make it more effective.

### **Survey Conducted**

Survey research is a method used for collecting information about a population of interest. In order to develop the software product what the user (faculty) needs, the most important part in product development is the customer requirements. To know the customer requirements, a survey was conducted by using a questionnaire. Below are the topics on which the questions were asked.

- Need of software to map Course Outcomes to Program Outcomes
  - From observation it was sure that software is required, but looking at faculty's point of view software may increase or decrease the work load.
1. 92% of the sample population do think that software can help them better assist activities such as mapping Course Outcomes to Program Outcomes and other related activities.
  2. Present method of completing the activities.
  3. As faculties are presently doing all the activities involved and also completing it, we wanted to know which particular method or tool they are using presently. As too much of diversion from the present method would make the new product implementation quite difficult. Responses were collected as
- Hand Calculations
  - Spread Sheet (MS Excel)
  - Custom OBE software

Major portions of the population were using spread sheets to do the attainment calculation. There are advantages and disadvantages associated with all the options. To know the same, advantages and disadvantages of using it were collected.

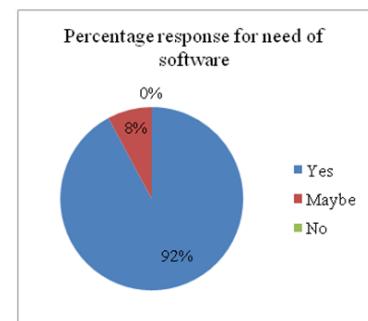


Figure 1 Percentage Responses for Need of Software

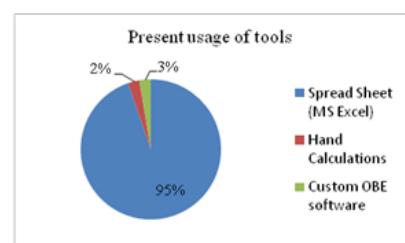


Figure 2 Present Uses of Tools

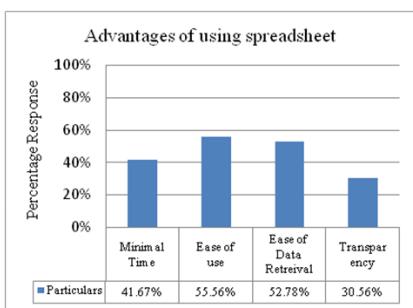


Figure 3 Advantages of using spread sheet

The various functions of spread sheet make it the most popularly used tool. Also the interface of excel is user friendly. With these advantages, around 42 % of sample population have responded that they can do their work in minimal time using excel. Around 56% agrees that it is easy to use for their data entry and calculations. 53% of the sample population are able to retrieve data stored in excel.

This advantage is not common for all the users as data retrieval from excel is tiresome. One can search using the search tool box, but when there are multiple requirements, it makes it complicated.

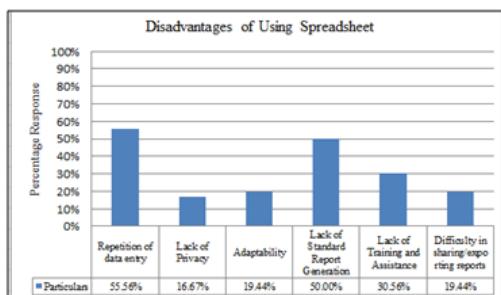
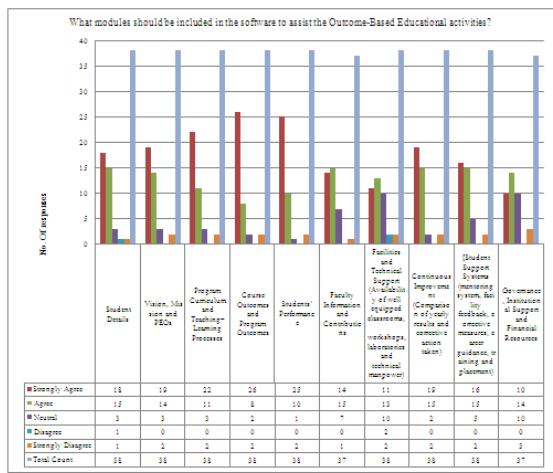


Figure 4 Disadvantages of using Spread Sheet

calculations need the knowledge of functionalities and the possible codes. Hence training is required and at times assistance if one goes wrong. After the reports are generated, they have to be shared with the concern authorities. 20% of the sample population do have difficulties in sharing it.

### What Modules are Required in the Software?

Apart from performing the attainment calculation in the software, it can also help in many other activities as there will be a central database of student's information. To know the other requirements of the faculty, a question was asked for the modules they need in addition in the software.



All most all of them require all the modules to help them in their routine activities. The modules are as follows Student details: The purpose of it is to create a central data base of students enrolled in the department. This will ease the course registration process and also the post processes such as giving the list of students to particular faculties. Vision, Mission and PEOs: The department information will be displayed here. Program Curriculum and Teaching-Learning Processes: The details of the program and courses included will appear here. The different ways in which student performance will be assessed will also be displayed here. Course Outcomes and Program Outcomes: The outcome of the particular course and the outcome of completing the complete programme will be displayed here. Students' Performance: Performance of each individual in each assessment tool will be available here. Faculties can download the standard pre-created excel file, populate them with student's marks and upload.

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**Faculty Information and Contributions:** Many a times faculty's contribution is not noticed and their talent might stay hidden. In this module, detail information of faculty will be available i.e., starting from educational information to the achievements made by them.

**Facilities and Technical Support:** To be par in the industry with respect to knowledge and skills of using various tools, soft ware's, etc institution should have the facilities and technical support for the same. A list of all those will appear here and the time slot at which they are available.

**Continuous Improvement:** In any system, the best is always achieved by performing improvement activity. When this improvement activity is continues, the system will be in par with the requirements of the society. In the software, faculties will be able to compare the performance yearly and can also draw necessary conclusions. The conclusion can later be used by them to improve the performance in the upcoming batch.

**Student Support Systems:** There are the mentoring system, facility feedback, corrective measures, career guidance, training and placement. Up to date information and links can be displayed. These systems take input from the students and improve the system over a period of time.

**Governance, Institutional Support and Financial Resources:** Student's creativity and innovation are often killed by the financial barriers. Government have taken many initiatives to fund the student ideas and help them grow. The information regarding financial support from government and institution is not available to most of the students. To overcome these problems, possible finance support and the provision of such can be displayed to the students.

### Bloom's Taxonomy and Level of Attainment

The cognitive domain of learning, involves knowledge and the development of intellectual skills. The different levels are as follows:

- Remember
- Understand
- Apply
- Analyze
- Evaluate
- Create

Each level can be seen as increasing in the level of difficulty. The similar pattern is being used in question papers. In the survey, a question was asked if the performance and hence the attainment was effected by asking the higher level questions.

71% of the sample population agree that student's performance decrease if a high level question is asked. This also varies on the type of course i.e., theoretical or numerical.

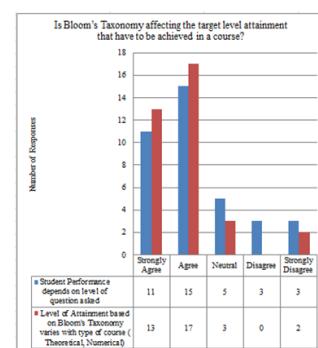


Figure 6 Effect of Blooms Taxonomy on Student Performance

## Co-curricular Activities

Complete learning, understanding and applying the knowledge cannot happen inside a class room. This modern era, often considered the new industrial renaissance or the 4th industrial revolution, requires a reconceptualization of ways the industry and academia collaborate for preparing students for the global workforce. The co-curricular activities like internships, Industrial Visit/Industrial Training, Massive Open Online Courses (MOOCs), Technical Workshops are the new platforms for creating industry ready students. A question was asked if these really help students or not and if yes then should there could be weight age assigned to it.

79% of them do agree that these co-curricular activities help in indirectly attaining course outcomes.

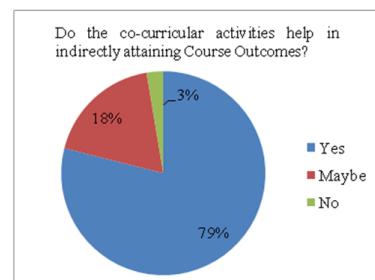


Figure 7 Percentage Response if Co-Curricular Activities Help in Indirectly Attaining Course Outcomes

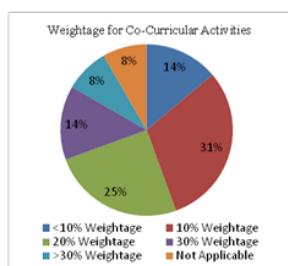


Figure 8 Percentage Responses for Weight age for Co-Curricular Activities

78% of the sample population agree that 10% or more weight age can be assigned to these co-curricular activities.

## Software Functionalities

Course-wise Co Po matrix, comparison of student performance in CIE and SEE, condensed CO-PO matrix of all the course handled, personalized student wise report and achievement during the course. These are the expected functionalities required by the faculty. A question was asked if they would use them or not.

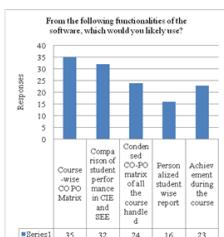


Figure 9 Number of responses for functionalities the faculties would use

## Dedicated Mobile Application

Mobile is one the most frequently used gadgets by most of them. If the application is available to them on the phone, will they use it? Will the application help them update the information more easily? A question was asked if a dedicated mobile application was required for the routine activities.

## Conclusion

With this survey, we have got a positive response to proceed with the development of it. Most of them are running out of time for bringing the slow learners up. Also auditing activities require additional time. Total time available is a constraint and cannot be increased. Due to which either the faculty will be frustrated due to overload

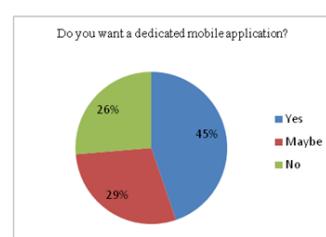


Figure 10 Percentage Responses for Requirement of a Dedicated Mobile Application

or not be able to maintain the required reports. To ease their routine activities we are developing a software package that will assist them and do the complex calculations and analysis.

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