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Importance of students' feedback for modifying course syllabus and revising Curriculum of UG Electronics and Telecommunication Engineering Programme

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Importance of students' feedback for modifying course syllabus and revising Curriculum of UG Electronics and Telecommunication Engineering Programme

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***Abstract*—**The goal of education is to create an environment that assists teaching and learning. Modification of courses, and Course Outcomes is necessary to cater to the changing needs of students and enhance their learning experience. Under academic, freedom to change the curriculum in resonance with industry needs and current trends makes the student more skilled, knowledgeable, and employable. Feedback is a traditional way of making improvements in the educational field. This paper gives direction on the use of Students' feedback for revising the curriculum and modifying the Course Outcomes for the Undergraduate program in Electronics and Telecommunication Engineering. We have collected online feedback for course curriculum and course outcomes from students for each academic year. Responses from feedback which are feasible are used to revise the syllabus, and next structure. We discovered it as a very useful way of making students part of the syllabus and course design process.

Keywords: Course outcome, Curriculum revision, Students Feedback

I. Introduction

Outcome Based Education involves the modification of curriculum in undergraduate education to reflect the achievement of better learning and command over courses rather than the accumulation of course credits. Both structures and curricula are designed to achieve Outcome-Based Education [1].

Feedback is primarily intended to help learners and teachers modify their thinking and approach to improve learning outcomes. Generally, feedback is viewed as information provided to improve performance; however, feedback can be utilized equally effectively to alert instructors to errors or weaknesses in their teaching methods that might be improved. Motivation and consistency in performance are equally important [3].

Feedback regarding the course curriculum and course outcomes is obtained from the learners. The feedback is analysed and the course curriculum is modified accordingly. Feedback has a significant impact on curriculum development. We collected feedbacks from alumni who are placed in companies, current trends and the future trends in the industry, and students' feedback about the course curriculum. The college is dedicated to impart technical education to women engineers and developing them as innovative leaders for future generations, so the education given to them must be relevant to the industry.

A literature review is presented in brief in Section-II of this paper. Section-III describes the methodology for curriculum revision. Section-IV is about the Analysis of feedback and discussion followed by References.

II. Literature Review

Carly Steyn et al. discussed a method to collect feedback during tutorials. During the course, students were given feedback forms on which to record suggestions on how to improve the course for future cohorts. It was informed to students that their suggestions would be used for course development. Tutors were requested to provide reflective feedback on their experiences while facilitating the exercise. The analysis of feedback is done on eight broad areas, these included curriculum/course content, staff quality, assessment, learning support, teaching methods, teaching and learning resources, course administration, and the learning environment. All feedback received from students are not feasible and constructive for academics and implementation [8].

Trudy Ambler et al. described a newly developed First-Year Block Model (FYBM) curriculum, implemented at an Australian university. Feedback from students revealed that the main features of the FYBM curriculum that influenced their experiences of learning were a sense of familiarity and curriculum leadership; curriculum development team included students as stakeholders and students were provided with an opportunity to take responsibility for their learning and customize it by having guided access to staff members, relevant activities, and resources [9].

Ramona Lile, et al. investigated the importance of developing higher education students' information literacy competence. Learners' learning goals emphasize critical thinking and problem-solving, communications, motivation, numerical judgment, scientific knowledge, capacity to reflect on ethical behaviour, and depth of specialized knowledge. An online portfolio is a versatile evaluative tool for all academic disciplines, providing both a snapshot of the learning outcomes and a description of its details. Graduation completion students have to prove their competencies and involvement in the assessment of portfolio content along with learning results [7].

P. Ravi Shankar, et al. discussed a study of determining students' perceptions of the integrated curriculum and related assessment methods. The students who have followed a fully integrated curriculum had a more positive opinion of the curriculum [2].

Md. Mamoon et al. described the ways to improve the feedback process in higher education. Feedback delivery models that are outdated are replaced with more modern, effective, and valuable ones. In higher education, lecturers are expected to provide feedback to students; feedback plays an important role in students' learning processes. In order to make feedback more effective and useful to student learning, the following suggestions have been made: Encourage students to understand what good performance or a goal means, Simplify the improvement process of self-reflection, allow peer conversations about feedback, Foster positive motivational beliefs, provide opportunities to close the gap between current

performance and desired performance. Various E-Feedback techniques are being adopted: Email Feedback: Audio and Video Feedback: Screencasts: Recycling written comments [5].

III. METHODOLOGY FOR CURRICULUM REVISION

Feedback is a closed-loop system that minimizes error and provides stability to the learning process. This method is followed for improving the curriculum process in higher education.

The Electronics and Telecommunication department curriculum is developed by the Program Assessment and Quality Improvement Committee (PAQIC) by taking into consideration student feedback, alumni feedback, parent feedback, and industry feedback.

- PAQIC consists of the Head of the department and all teaching faculty members. PAQIC drafts the basic curriculum.
- Curriculum drafts are reviewed by the DAB (Department Advisory Board). DAB comprises the Head of the Department, Student Alumni, NBA coordinator, and senior subject experts from the department.
- Board of Studies (BOS), this committee consists of experts nominated by the Vice-Chancellor of SPPU, two subject experts from outside Parent University, industry experts, and eminent academicians.
- The suggestions given by the BOS committee in the program curriculum are integrated. The program curriculum is then presented to the Academic Council for approval of the designed program curriculum. The curriculum structure finalized by the Academic Council (AC) is presented to the Governing Body (GB) of the institute for its approval and implementation.
- Student feedback is taken at the end of each semester, it is analyzed and discussed in the PAQIC meetings.

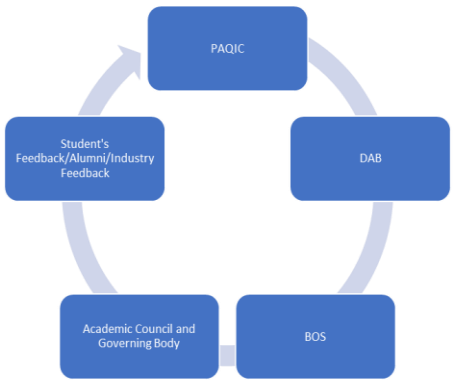


Fig.1 Cycle for curriculum development

Curriculum Feedback:

A survey of undergraduate students in Cummins College of Engineering for women was conducted online among S.Y.B. TECH, T.Y.B. TECH, and Final year B. TECH students, after completion of SEM-I and SEM-II syllabus.

To collect feedback on the curriculum and the course outcomes, a google form has been created, which is common for all departments.

following is the questionnaire for course curriculum feedback,

1. How do you find the difficulty level of the contents of the course: course code course name?
2. How do you find the difficulty level of the contents of the current year courses as compared to the courses studied in the previous semesters?
3. What is your opinion on the number of daily contact hours as per the time-table?
4. What's your opinion on the number of laboratory hours?
5. What's your opinion on the number of tutorial hours?
6. Did you find the experiments performed in the laboratory course: provided conceptual clarity?
7. What is your overall rating for the S.Y.B.TECH/T.Y.B.TECH/FINAL YEAR B. TECH E&TC Engineering curriculum?
8. Any suggestions to improve the S.Y.B.TECH/T.Y.B.TECH/FINAL YEAR B. TECH E&TC Engineering curriculum?

IV RESULTS AND DISCUSSION

Summary of Curriculum feedback is shown in Table 1. From S.Y.B. TECH 207 student responses were received for curriculum online feedback.

Table 1 Summary table for curriculum feedback

S.Y.B.Tech Sem-I Subjects	Subject Difficulty Level (High,Medium,Low)	Lab Conceptual Clarity	Manageable	Burdensome
Electronic devices and circuits	High (78.7%)	Always (51.5%)	NA	NA
Network theory	High (77.7%)	NA	NA	NA
Digital electronics	High (61.9%)	Always (61.4%)	NA	NA
Data structure	High (71.8%)	Always (50%)	NA	NA
Engineering mathematics-III	High (68.3%)	NA	NA	NA
Contents of the s.y.btech courses as compared to the courses studied in F.Y.B.Tech	High (62.9%)	NA	NA	NA
Number of daily contact hours as per the time table	NA	NA	39.1%	-----
Number of laboratory hours	NA	NA	NA	more (81.7 %).
A number of tutorial hours	NA	NA	NA	more (82.7 %).

The overall rating for the S.Y. B.Tech [E&TC] Engineering Curriculum is very good (81.2%)

Students feedback was analysed and corrective action taken after discussion in PAQIC meetings. In addition to analysis, suggestions were received, but not all of them are feasible and constructive from an implementation standpoint. During PAQIC meetings, suggestions are filtered out by means of feasibility, competencies, and Program Indicators (PI) for the particular course.

The action was taken on suggestions/comments from students:

Following are the Suggestions from students which are taken into consideration to update the syllabus and structure:

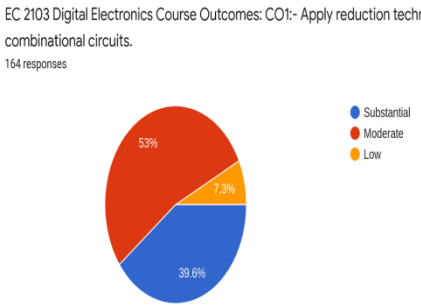
Sr. No	Suggestions from Students	Action taken in the curriculum
1.	*About Project-Based learning:* ***1.****kindly include project-based learning.* ***2.****Project-based learning should be made part of the curriculum*	-Project-based learning started with courses in Digital Signal Processing, Digital Image Processing, VLSI, Machine learning, Data structure, Embedded System, etc.
2.	*Placement related:* *1.Placement-related subjects should be included, if students are interested in the software domain.*	-Subjects that are essential for placement are included in the syllabus e.g. Artificial Intelligence, Machine learning using python, and Advanced Java.
3.	*About Syllabus:* ***1.****The subjects which are essential from an industrial point of view should be included in TY so that they will be helpful during placements.* ***2.****There can be labs for the Program Elective-2.* ***3.****Data Structure syllabus to modify.* ***4.****System Programming and Operating System syllabus should be more on the operating system* *5.QA and CS sessions must be taken in S.Y.B. TECH instead of TY BTech.*	-VLSI Design and Computer Networks and Security courses are shifted to the third-year sixth semester. -The Lab course for the Program Elective-2 is added. -The difficulty level for Data structures and algorithms is elevated. -QA and CS sessions shifted to S.Y. B. Tech.

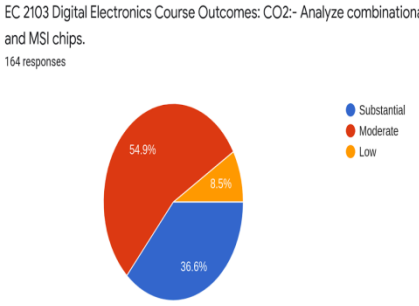
Table 2 Student suggestions

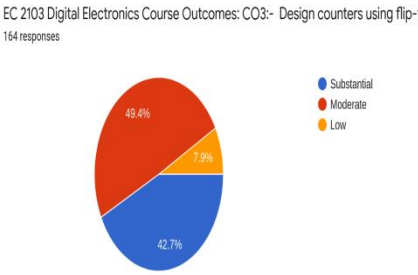
Course Outcome Feedback:

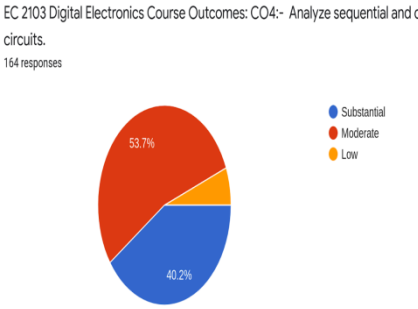
Feedback on course outcomes from S.Y.B. TECH, T.Y.B.TECH, and Final Year B.tech students was collected through a google form . Upon completion of the syllabus and labs, we distribute a form to the students. Each course has four to five-course outcomes. Separate questions were drafted for each Course outcome under the three choices: substantial, moderate, low.

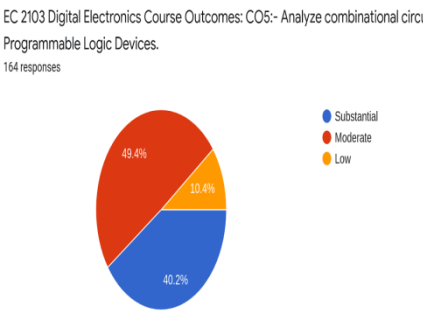
A choice among substantial, moderate, and low options allowed a percentage of outcome to be determined. Fig.2 shows responses acquired from students for the subject S.Y.B. TECH Digital Electronics course. Likewise, response from S.Y.B. TECH, T.Y.B.TECH, and FINAL YEAR B.TECH students were collected and analyzed.











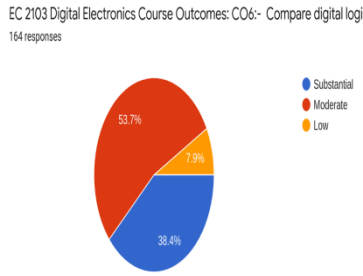


Fig.2 Responses for Digital Electronics course for Six Course Outcomes

If any course receives less than 40% under substantial is subject to detailed discussion by the department head, and actions to be taken to improve the course outcomes are communicated to course instructors.

Course Outcome feedback is used to improve the course as well as to calculate the indirect attainment. The coordinator shares the collected feedback with respective course teachers and analysis is done to calculate indirect attainment.

CONCLUSION

The development of the curriculum is an integral part of autonomous institutes. Revised structure and syllabus have to be scrutinized various committees PAQIC, BOS, Academic council, Governing body of the Institute. The revised syllabus is drafted after receiving multiple feedbacks like student feedback, industry feedback, Alumni feedback, and parent feedback. This paper emphasizes the role of student feedback for the development of the curriculum. We have taken note of students' suggestions to revise the structure and syllabus and suggest this as an effective way for course improvement and development as it is from the most important stakeholder, the students. 10 to 50% changes in the revised syllabus are done. Beyond 50% some new courses were developed.

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