

49. Methodology of Teaching Engineering Students: Towards Improvisation of Teaching-Learning Process

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Abstract:

The student is well receptive if the teacher covers the syllabus uniformly in a semester. A barchart is useful to get a pictorial view of the extent of syllabus to be covered. The dissemination of knowledge could be improved through visuals and animated figures. The means to improve the quality of teaching and the receptiveness of a student are described in this paper with the help of a course on “electromagnetic fields and waves”.

Keywords: assimilation, imparting, dissemination, barchart.

I. Introduction

Dissemination of knowledge requires: (a) clear understanding of content by a teacher first and (b) adopting good presentation skills so that every student of the class understands the subject. The authors observed that the coverage

of syllabus is faster during the final phase when the university examinations are closer. As a result even the bright student is unable to perform better. The issues and the possible remedial actions are described in this paper.

II. Objectives

The paper is aimed at bringing an awareness, primarily, to a teacher right at the beginning of semester on the extent of preparedness and knowledge gaps on various contents of the subject to be taught. The secondary importance of this paper is to provide an advance information to the student for a better preparedness.

III. Organization of Course Content

The course content of a subject on “Electromagnetic fields and waves” is in Fig. 1 in the form of a barchart. The level of preparedness for each section is also shown. At each bar the number of lectures is shown in the form of vertical arrows. The total number of lectures in the present case is 34. These are covered within a timeframe of 16-18 weeks which is typical of a semester. The tests and the internal examination to be conducted are also indicated. The test is of short duration while the examination is in the university format and of a longer duration. The preparedness is given in percentage - 100% indicating the lecture could be delivered within a short time refreshment of the content.

IV. Influence of Tests and Internal Examination

It is common that a student starts his active preparation a few weeks before the final examination. The importance of conducting tests and an internal examination is to: (a) assimilate content taught, (b) ease the pressure/stress and organize better for university examination, (c) churn the content for a better understanding, and (d) feedback to the teacher on students' assimilation and class performance. In Fig. 2 the content accrued, expressed in arbitrary units, over the time is shown. Each lecture is indicated by a small arrow close to the abscissa. The bigger arrow pointing upwards represents the weekly content. All this content is to be assimilated and to be well understood to face the examination. If a test is conducted after a certain number of lectures the student is bound to assimilate the contents better and move further on a better footage. During the last one month more than 40% of the content is covered resulting in crossing the threshold level of receptiveness due to which, even, the active student is unable to cope up with the load.

V. Issues and Remedial Actions

In the present era a wealth of information is available by a simple touch button. A lot of knowledge gaps, both to the teacher and to the student, could be bridged with the information available on net. However, a regular teaching in classes and face-to-face discussions are essential for a better understanding of the subject. Some of the common issues in India in the teaching in

engineering are as following:

- a. Improper coverage of syllabus.
- b. Long absence of teacher in certain cases.
- c. Less attention on tests and internal examinations.
- d. Poor archiving of expert lectures and past university question-answers.
- e. Teaching limited primarily to achieve good scores.
- f. Less interest to the students on other than the job fetching subjects.
- g. Lack of training and orientation courses to the teachers.
- h. Lack of research facilities.

The role of college/university management is vitally important in addressing and circumventing the above issues. The preparation of barchart may be kept mandatory. The coverage of syllabus by any teacher vis-à-vis the barchart may be monitored and the feedback from the students may be taken.

The lectures by experts, invited from time-to-time, may be videographed and archived. The expert lectures of reputed institutions may also be added to this archival for an immediate access to the teacher.

VI. Summary

A good teaching-learning demands an uniform coverage of the subject material all through the semester to enable a student to exploit his full potential. A bar chart enables a teacher to find out his/her preparedness much in advance so that needful efforts could be made to bridge the gaps. The chart is also useful to the student in attending the classes with a prior reading for a better understanding. The graphical representation of time versus 'accrued content' is useful to understand the extent of load a student has to bear in the assimilation to perform better. The intermittent tests and internal examination not only shape the student in time management but also boost the confidence level for the university examination.