PERFORMANCE ENHANCEMENT BY APPLICATION OF COEXTENSIVE STIMULUS TECHNIQUE

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ABSTRACT

The purpose of this paper is to discuss the innovative method of evaluating students performance in mathematical based subjects. With the primary objective of knowing the students knowledge in fundamentals of mathematics required for applied electronics. So that we can have idea about their level of understanding for a particular subject and we can go ahead in a particular direction. This will help to do continuous analysis of those students with poor performance, by implementing extra hour lecture apart from regular course so as to improve their performance.

The use of innovative methods in educational institutions has the potential not only to improve education, but also to empower people, strengthen governance and galvanize the effort to achieve the human development goal for the country. So in this process we have started this approach for second year third semester students having subject Network Analysis in Department of Electronics & Telecommunication Engineering at Sanjay Ghodawat Institute.

Keywords–*coextensive,teaching,learning stimulus , remedial , network, analysis*

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1. Introduction

Students learn in many ways— by seeing and hearing; reflecting and acting; reasoning logically and intuitively; memorizing and visualizing and drawing analogies and building mathematical models; steadily and in fits and starts. Teaching methods also vary. Some

Instructors lecture, others demonstrate or discuss; some focus on principles and others on applications; some emphasize memory and others understanding. How much a given student learns in a class is governed in part by that student's native ability and prior preparation

but also by the compatibility of his or her learning style and the instructor's teaching style.

Mismatches exist between common learning styles of engineering students and traditional teaching styles of engineering professors. In consequence, students become bored and inattentive in class, do poorly on tests, get discouraged about the courses, the curriculum, and themselves, and in some cases change to other curricula or drop out of school.

Professors, confronted by low test grades, unresponsive or hostile classes, poor attendance and dropouts, know something is not working; they may become overly critical of their students (making things even worse) or begin to wonder if they are in the right profession. Let us consider a typical classroom consisting of sixty students scaling half of the population as brilliant and motivated a lot, but the other half does not hold good in same ground. Many students are less focused and lack in mathematical skills which is profoundly not a good situation. Most seriously, society loses potentially excellent engineers .In discussing this situation, we will explore:

1. Which aspects of learning style are particularly significant in engineering education?
2. Which learning styles are preferred by most students and which are favoured by the teaching styles of most professors?
3. What can be done to reach students whose learning styles are not addressed by standard methods of engineering education?

Dimensions of Learning Style

Learning in a structured educational setting may be thought of as a two-step process involving the reception and processing of information. In the reception step, external information (observable through the senses) and internal information (arising introspectively) become
available to students, who select the material they will process and ignore the rest. The processing step may involve simple memorization or inductive or deductive reasoning, reflection or action, and introspection or interaction with others. The outcome is that the material is either "learned" in one sense or another or not learned.

A continuous evaluation process classifies students according to where they fit on a number of scales pertaining to the ways they receive and process information. Such an innovative parallel reinforcement technique model intended to be particularly applicable to numerical based subjects in engineering education is proposed below.

Also proposed is a coextensive *teaching-style model,* which classifies instructional methods according to how well they address the proposed learning style components.

2. Methodology

Every year round about 120 students admitted into our undergraduate program in Electronics & Telecommunication Engineering among which 50% have lateral admission from Diploma of Electronics & Telecommunication Engineering ,taking up the third semester subject Network Analysis. As for better understanding the total students are splitted in two equal halves. Network Analysis being a critical subject based on mathematics. The students performance at university level examinations is very poor; where merely only half percentile are able to clear the subject. Thus the ultimate challenges are to deal with

-Finding the low performance students.
-Scaling out and discussing the problems.
-Step wise solution of problems.
-Subsequent clues of every typical problem.

In coextensive stimulus we apply simultaneous reinforcement learning in which what to do/how to map situations to actions so as to maximize the percentage of successful students. One must discover which actions yield the most reward by trying them. In the most interesting and challenging cases, actions may not only give the immediate results but also the next situation and, through that, all subsequent results.

Coextensive stimulus learning is denned not by characterizing learning methods, but by characterizing a learning problem. Any method that is well suited to solve that problem, we consider to be a reinforcement learning method. The basic idea is simply to capture the most important aspects of the real problem a student is facing ,interacting with its environment to achieve a goal. Clearly, the student must be able to understand the problem statement and the apply relevant analysis and must be able to solve the numerical problem.

Analytical Test

Analytical Test on basics of the subject Network Analysis helps to evaluate the basics of applied electronics concept, along with mathematical problem solving ability just like ratio, differential equations, algebraic expressions. Two different set of question papers were given to the students one at the commencement of the semester , so as to scale out the low performance students in order to provide the subsequent remedial classes and motivate them to score more. The other set examination was taken after two months of remedial session. Duration of the test was sixty minutes.

Out of 39 students who appeared for the first analytical test , the number of students who scored less than 48% were identified as 7 i.e. the percentage of failure is 18%.This test helped us to gather information about the areas of weaknesses of each individual and simultaneous remedial action to be applied.

Strategy

On continuous evaluation basis assignments and remedial sessions were conducted in order to foster improvement in numerical solving ability whereby focus was laid on following aspects:

-Enhancing the understanding of basics of electrical networking Laws like Kirchhoff's Voltage Law , Kirchhoff's Current Law.
-Revising the basic concepts.
-Analysis of a circuit in steps.

-Mathematical tools applicable to solve numerical.
-Developing a homogenous discussion forum in classroom.
-Discussion and improvement on usability of mathematical tools and techniques.
-Understanding the strategy for examination based preparation through tests and assignments.

After two months of continuous remedial session beside regular classes, for the same group of students who appeared for the second evaluation test the number of students who scored less than 48% were identified as 5 . Thus the percentage of failure reduced from 18% to 13% & also helped to increase the number of students achieved distinction from 2 to 13 ,yielding 34.2% students in distinction range[fig3].

3. ANALYSIS

This analysis emphasizes the impact of, subject remediation on academic performance and outcome for a large number of upcoming students for engineering. A fundamental problem in evaluating the efficacy of subject remediation is an inability to disentangle the causal effect of remediation from other factors affecting student outcomes. By design, students who do and do not participate in remediation, have different levels of academic preparedness.

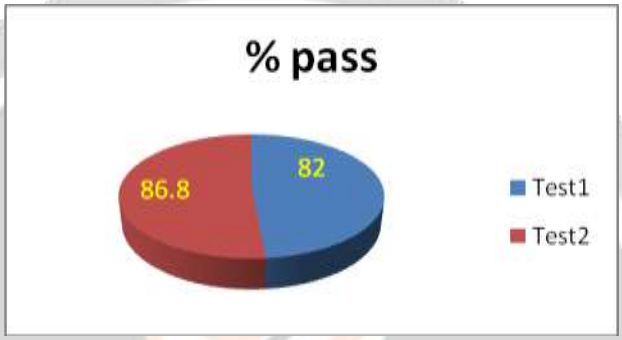

Fig1: Percentage of Passing

Keeping these factors in mind the test conducted on remedial grounds is considered on a high cut-off percentile of 48%, so that a higher level of performance skill can be inculcated among the student community.

Also an important point is that the number of students attending the remedial lectures were variable.Also effectively a handful of students attentive during the remedial sessions can gain large amount of information and a better understanding level.

Considering the mass of 60 students were divided into a group of 20 students who can interact, listen & learn the concepts well.

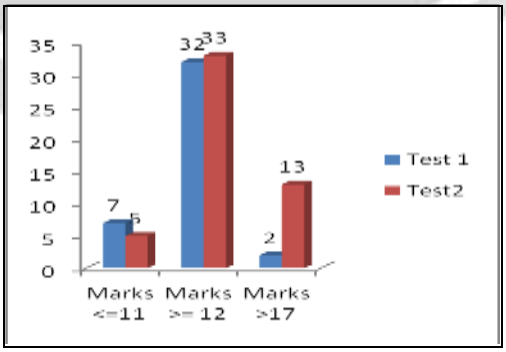

Fig 2: Test Scores for Pre remediation & Post remediation

Many or most engineering students are visual, sensing, inductive, and active,

and some of the most creative students are global; most engineering education is auditory, abstract (intuitive), deductive, passive, and sequential. These mismatches lead to poor student performance, professorial frustration, and a loss to society of many potentially excellent engineers. In this paper already we can see a potential increase in the passing percentage to about **86.8% [fig1].**

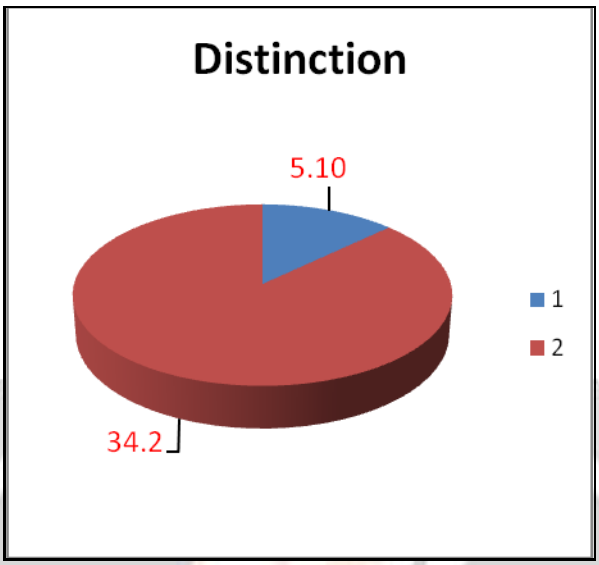

Fig3: Percentage Of Distinction

4. SCOPE

With the good evidence that students in remediation have better grades in subsequent test levels, our findings lend support to the view that remediation actually improves student outcomes. In fact, some of our results are improving on the number of academic credits attempted . It is possible that coextensive stimulus technique can be more widely applied to other subjects in Engineering, perhaps there may be any more suggestive points better designed or because they are targeted more effectively, have stronger positive effects. This will in turn lend confidence in upcoming years to develop a better understanding of the applications of Network Analysis.

5. CONCLUSION

On the basis of coextensive stimuli the remedial classes and pre and post remedial test conducted we can infer that identifying the weakness, developing interest in numerical based subject, with prior successful completion of the 4 year degree course in order to overcome the lagging result scenario will surely lead to a positive direction .On a positive note the educators need to realize & motivate the students for hard work, perseverance and the need to develop a discussion forum to achieve the epitome of success.

6. ACKNOWLEDGEMENT

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