

CREATIVITY AND INNOVATION IN ENGINEERING INSTITUTES.

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ABSTRACT

Innovation and creativity are inter-related and is the only way to remove the obsolescence existing in the present system. Removal of bottlenecks, new combinations and integrations, assessment of solutions etc., are some of the ways through which it can be attained. Understanding the students problems, obstacles on achieving the goals, are of utmost importance in order to prepare them for this competitive world.

1. INTRODUCTION

The main purpose of engineering education is to harness the natural resources and human talent for the economical and social development. It is one of the most important sources of qualified man-power for our industry. But lately, it has been observed that engineering institutions are not able to cope up with the needs of real world. Due to the fast technological changes, industries are engaged in new and innovative methods of production, while on the other hand, the institutions are unable to offer what actually is expected of them.

In this regard the concept of creativity and innovation in the context of engineering institution is an effective way to succeed. Innovation and creating the conditions for pioneers of

innovation to emerge, would enable us to achieve many of the objectives of engineering education and equip students for real life situations. It would enable them to lead a meaningful life of some significance.

Individual creativity is important to both learning and teaching. Therefore, the students should be made to think and innovate. In the present circumstances, they cannot afford to compete on "work hard" basis only. Therefore, all institutions must have a cell for innovation and should know how to manage the same.

2. CREATIVE INNOVATION

There are three ways to come up with new ideas, new approaches and new methodologies:

- i) Removing bottlenecks

ii) New combinations and integrations

iii) Assessment of solutions

Innovation is a creative solution to remove bottlenecks and hindrance to a sustainable performance. Since the performance improvement requires change over time, to achieve the long lasting results, innovation should be a continuous process. Therefore, for an institution to have distinction from other institutions, innovation is also a source of differentiation.

2.1 Removing bottlenecks

It is necessary to understand the details of goals that students should achieve through education and also the hurdles being faced in achieving these goals. Some of the goals to be achieved by engineering education are:

- developing ability and self-confidence
- developing a high sense of professionalism
- developing ability to make best use of situation available
- develop students' capacity for thinking and working independently.

In India, more attention is paid to discipline and its course content which is a less beneficial process. Teacher is only an intermediate between student and text. He has no real choice but to strictly follow the prescribed syllabus. To keep up with the pace of developments, and reflect the present state of art, these syllabi should be subjected to revision frequently. Any deficiencies in the syllabus should be removed well in time and designed to suit the demand of real life. Identifying a bottleneck requires different skills from those

useful in searching for the possible solution. A rational and analytical approach should be adopted for its identification, whereas solving the problem demands creative mind. Thus innovation does not mean only a creative process and letting everyone have free reign, but an interaction of the expansive, holistic thought process and the analytical, fact-based approach.

2.2 New Combinations and Integration

There are many possibilities of innovation by coming up with new combinations. After developing different ideas, a logical and analytical assessment can prove or disprove the viability of each idea. The need for interdisciplinary approach to many of the technical problems that need solution is paramount. Therefore, institutions can offer new streams of specialisations in diversified areas. Very often we find that the engineers are unable to find jobs as they do not meet the requirement of the employers. Instead of producing jack of all trades and master of none, specializations should be offered.

2.3 Assessment of Solutions

In order to achieve maximum differentiation one should maximize stra-

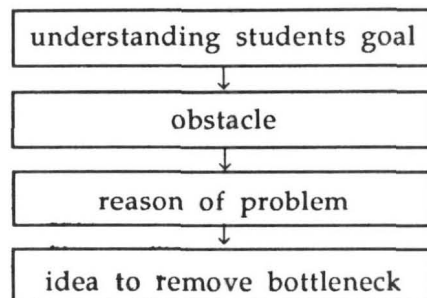


Fig. 1

tegic degree of freedom. In this context before mobilizing our resources, we should understand the magnitude of real problem, the obstacles in achieving the goal, the reason behind problem, possible solution and the key factor for success. The procedure to be followed for students problems can be formulated as shown in fig. 1.

The assessment of the degree of the strategic freedom avoid waste of time and labour that is bound to occur if teacher fails to determine in advance the best direction of improvement.

3. MANAGEMENT OF INNOVATION

However, innovation cannot be realized if it is not managed properly. Institutions can prompt innovation in the following different ways.

3.1 Empowerment :

Empowerment is a key to innovation. When individuals are allowed to work upon their ideas and less people and system are accountable to, the more opportunity they will have to exercise their ideas.

3.2 Commitment to innovation :

Institutions should be committed to a vision of innovation. People involved should be encouraged and duly recognized.

3.3 Right attitude :

One should develop the ability, interest and the courage to keep asking "Why?" until the answers are basic enough to guide creative effort. If not satisfied with the surface explanation individuals strive to achieve perfection through their efforts. The lack of self-

confidence and the deep, inner certainty that they are capable, inhibits making innovation.

Insight and a consequent drive for achievement promote creative thought process which in turn enable one to work out effective strategies aimed at creative innovation e.g. students should be encouraged to ask questions even if there is a diversion from actual topic being discussed. It should develop self-confidence in them.

3.4 Right Climate :

Before an innovation is realized there could be hundreds of ideas. Perfection of wrong ideas under the pressure of circumstances can lead to disastrous results. Therefore a healthy environment is a must for the fruition of any innovation.

3.5 Proper Communication :

The role of Institutional management is of utmost importance in promoting innovation as an idea and conveying a sense of excitement and challenge that innovation will bring to the institution. In this regard, information being shared at different levels should be reliable and without any distortion. 'Killer system' that modify the message every time it is communicated, can hamper the results greatly. Any ambiguity discourages the creative people, so the plans of the institution should be clearly defined.

3.6 Use of Outsider to Remove Bottleneck to Innovation :

Co-operation of persons not belonging to the given system should be welcomed to remove bottlenecks. Very often for a person directly involved in

solving the problem, it is likely to skip some details of significance. It could be a minor problem but a real cause of all troubles.

4. CONCLUSION

Finally, it could be concluded that not the 'work hard' but the innovation must serve the student and the Institution to achieve their goal in today's world. The role of management at different levels is also of utmost importance. By encouraging innovation

and creative people and ideas, one would be able to achieve goal and prepare in a better way for real life.

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and
Prosperous New year
to all of our
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Advertisers
and well wishers.