Key Issues and Measures to Improve the Current Status of Technical Education for Future Development

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Abstract: With the rapid technological advancement along with the increasing demands for qualitative and specialized manpower, there exists a strong need to improvise the current technical education management. Issues before the managers of the technical education are entrance level qualification to various institutes, admission procedure, intake capacity of institutes, autonomy and accountability of the institutes, quality and quantity of the research activities, importance and quality of the postgraduate and Ph. D studies, better curriculum design to enhance the industrial exposure, industry institute interaction to promote excellence at both places. Paper incorporates discussion on these key issues and suggested measures to improve the current status of the technical education for future development.

Key Words: Current Status, Key Issues, Measures, Quality, Technical Education

1. INTRODUCTION

In the 21st century World has witnessed rapid advancement in the field of the science and technology. The advancement resulted in the increase of productivity and quality of the products with simultaneous decrease in the cost of the products. Now market is customer dominated and success of any industry depends upon the customer satisfaction. Advancement in the field of the science and technology has also widened the gap between the rich and poor countries. This was mainly due to rich countries ability to develop new products and processes and their capacity to use technological advancements for the industries and society.

Globalisation and revolution in the information technology has made the technical education as a product. Employment opportunities have crossed the state and national boundaries. Presently persons are required to work at international levels. Advanced communication technology has also helped industries to search for the right candidate at the national and international level.

We have updated the contents of the technical education but the conduct remains same, what was it before thirty years ago. Research activities are still orientated to award the degrees. Knowledge and skills required for a job are no more restricted to their branch of study. Manpower requirement has been shifted from quantity to quality and specialization. Therefore the current degree and diploma holder are no longer able to satisfy the requirement of the industry and society.

It is need of hour to look into the various aspects of the technical education to meet the need of the industry and society. The various issues before the managers of the technical education are entrance level qualification to various institutes, admission procedure, intake capacity of institutes, autonomy and

accountability of the institutes, quality and quantity of the research activities, importance and quality of the postgraduate and Ph. D studies, better curriculum design to enhance the industrial exposure, industry institute interaction to promote excellence at both places.

2. KEY ISSUES & MEASURES TO IMPROVE CURRENT STATUS OF TECHNICAL EDUCATION

To meet the current requirements of the industry and society and to improve the quality of the technical education, key issues, which are of utmost importance and require immediate attention, are discussed and some measures are also suggested.

2.1 Entrance Qualification to Various Institutes

Presently minimum qualification for admission to three year and two-year diploma courses is pass from secondary and senior secondary respectively. After passing the secondary school, a student has to decide whether to study further or to take admission in diploma programme. Students who opt to study further, some of them are unable to clear senior secondary examination finally join the diploma courses after loosing two years. Numbers of diploma students, who are failed in senior secondary examination, are increasing year by year. Frustration is also seen to be growing in the diploma students (admitted after 12+) as they are not able to get admission in degree courses in spite of a large increase in the seats for degree courses.

The scenario is more complex for admission from diploma to degree course. A diploma holder admitted after passing secondary examination is allowed to apply for the degree admission in only few states. In other states only those diploma holders are permitted to apply for degree admission who have passed senior secondary examination. It denies large number of students to pursue degree courses though good number of seats remains vacant in the respective quota.

A reasonable solution to first part of the issue is to make all diploma programmes of uniform duration and minimum qualification for admission may be fixed as a pass from secondary school. It will help students to decide well in advance about their future plans. For second part of the issue, all diploma holders may be permitted to pursue degree courses depending upon their performance in the diploma programme. It will also minimize the vacant seats of diploma to degree admission quota.

2.2 Intake Capacity of the Institutes

The numbers of engineering colleges and polytechnics at the time of independence were 38 and 53 respectively [1]. These numbers have increased rapidly in the eighties and early nineties mainly due to the establishment of the self-finance colleges in the four states namely Karnataka, Maharastra, Tamilnadu and Andrapradesh. The trend was followed in other states in the last ten years resulting in very large number of engineering colleges and polytechnics in the India. The impact of such a large increase in intake is being now felt as numbers of seats remain vacant and more importantly engineering graduates and diploma holders are struggling to get the job of their calibre. Rapid increase in intake in information technology in last five years is now resulting in the large number of vacant seats.

The rapid increase in the intake also resulted in the dilution of the quality of the technical education. Majority of the institutes started recently does not have infrastructure to deliver the required quality of the graduates and diploma holders. The increase has also disturbed the ratio of the technicians to the engineers. Table (1) gives the details of the intake and ratio of diploma and degree intake [1] since 1947.

There is also imbalance in the development of the technical education in the geographical distribution as it has no relevance to any felt manpower needed or projected. This development is also not based on any state level planning for the technical education.

It requires for the reliable forecasting method for manpower requirement considering various factors. Future increase in intake should be based on the above forecasting. National level seminars can help in deciding the forecasting method.

Table 1 INTAKE CAPACITY AND RATIO OF DIPLOMA AND DEGREE INTAKE

Year	Diploma Institutes		Degree Institutes		Ratio (Diploma to Degree)
	Number	Intake	Number	Intake	
1947	53	3670	38	2500	1.47
1967	284	47000	137	25000	1.88
1977	*	60000	*	30000	2.00
1997	1100	184000	547	131000	1.40
2000	1224	232000	838	188000	1.234

* Data not available

2.3 Admission Procedure

The issue, which require immediate attention of the managers of the technical education, is of streamlining the admission procedure. For admission to degree level institute, presently JEE, AIEEE and other state level pre engineering tests are conducted. Few private institutions are also conducting test separately. Some of the states do not have any pre test and admissions are based on the senior secondary performance. These multiple tests result in overstressing of students, wastage of resources and time, create confusion in the minds of the students and parents and also frequent reshuffling of students from one institute to another institute.

Admission procedure is delayed for one or another reason and the effects are severed by the long duration of admission procedure. Past three years has witnessed the commencement of first semester of degree and diploma programme nearly after four to six months. For diploma it is further delayed as admission to diploma programmes which generally starts after the two or three weeks from the commencement of admission to degree programmes. Outcome of delayed semesters is short duration of semesters, students with poor basic knowledge, financial burden on the parents as student takes admission in science colleges also, causes wastage of valuable time of the students without being engaged in the fruitful activity.

Issue of such importance demands serious thinking at highest level as decision-making bodies are from all quarters of the technical education management bodies. A firm decision based on the long term planning of technical education can only bring a solution to this issue.

One way of reducing the multiple tests is to have maximum of two tests. A national level test equivalent to JEE meant for admission to IIT's and NIT's and all other institutes who desire to admit students at national level. State level admission can be based either on the performance in the pre engineering test conducted at the state level or the performance in the senior secondary examination.

Duration of the admission procedure may be shortened by extensive use of the information technology. Admission can be carried out simultaneously at various places using the Internet, which will not only reduce the duration of the admission procedure but also reduce the expenses incurred and problems faced by the parents and students while reporting to the admission centre.

2.4 Autonomy and Accountability of the Institutes

Autonomy as defined by J. N. Kapur [2] is the government of an organisation by the persons most deeply affected by the organisation, in the best interest of the organisation, and with minimum interference from the other agencies. Autonomy of the university means the government of the university by the stakeholders for the furtherance of education and research with minimum interference from the government while college autonomy means that the principals & Faculty members are the in charge of the admission, curriculum design, teaching, examinations and appointments subject to the control of the university.

Autonomy and accountability are mutually complementary. Accountability ensures the correct use of autonomy. An accountable system in technical education, comprised of the teachers, principal and administrative staff will bring the credibility to the college and as well as to the university. Accountability helps in achieving the quality in technical education.

With the sharp increase in the numbers of self-financed institutes, one may think to increase the control in examinations, admission, curriculum and method of teaching to achieve desired quality in technical education. But examples like IIM's may prove this philosophy wrong. Autonomy permits to vary the system parameters to achieve quality. On the other hand false use of autonomy will lower the credibility will automatically decrease institute reputation among the customers (students). Therefore autonomy forces the college and university to prove them continuously and hence quality (in terms of the student satisfaction) is being ensured.

Recent conversion of REC's in to NIT's and awarding them Deemed to be University status is just a step forward. Trend has been also followed by some of the Self-financed institutions is a good indication for the betterment of the technical education. To follow the worldwide trend [2] more progress is required in this area.

2.5 Research Activities

As already mentioned, the growth of the rich countries was due to their ability to develop new products and processes and to use them effectively for the betterment of the industry and the society. In context of India, we are succeeded partially. Our research activities are carried out at few institutes with a major share of IIT's. Research activities in the rest of the institutes are mainly oriented for the award of the degree. At diploma level nobody even think of carrying out research activities.

We need to carry out research at every level. Our activities must be oriented towards the development of the new products and processes then only these activities can prove their worth. Lack of funds to carry out research activities is a major cause for low profile of these activities. One way of forcing the institutions to carry out research activities is by asking them to generate part of the fund necessary for the functioning of the institutes. Not only it will bring society, industry and institute together but also improves the quality of education in an institute.

2.6 Postgraduate and Ph. D Studies- Importance and Quality

Intake to postgraduate courses was 70 in the year 1947 [1]. Intake capacity for postgraduates increased from 6000 in the year 1977 to 21460 in the year 2000. For PhDs annual out turn was only 370 in the year 1997. In past few years, the numbers have increased but still falling short of the requirement of the technical educational system. Majority of the postgraduates and PhD holders are absorbed in the educational field only. The shortage of PhD holder is felt severely after AICTE's has made compulsory PhD for the post of Assistant Professor and Professor.

Number of institute imparting quality education at postgraduate level and PhD are very less as compared with number of degree level institutes. Majority of the decisions in the institute offering UG and PG are driven by the need of the undergraduate programmes. Curriculum of the postgraduate courses are hardly revised and updated over the years. Placement activities in the institutes are mostly focused on the undergraduates. PhD work's application is also very limited.

To ensure quality at postgraduate level, the curriculum required to be revised, more funds to be allocated to fulfil the need of the postgraduate courses, faculties required to be more focused towards the postgraduate studies. By increasing placement for PG level, more number of students with better quality will be attracted to pursue postgraduates studies.

To fulfil the demand of PhD holders in near future, students are required to be motivated financially. The present increase in scholarship has already starting showing the results. PhD holders requirement is mainly in the field of the technical education. For the teachers who are already working in the institutes, they do not find any difficulty in pursuing PhD. On the other hand a fresh PhD holder has to search a job and required to compete with degree holders even for the post of the lecturer. Some suitable measures in this matter are required so that students are motivated to pursue PhD studies.

2.7 Curriculum & Industry

In the last decade, large numbers of institution were working to promote industry and institute interaction. Driving force behind this trend was to meet the demands of the industry where rapid changes in the technology resulted in the requirement of the specialized qualitative manpower. One of the results of the interaction was updating of the curriculum to meet the requirement of the industries. Diploma courses are finding difficult to fill all the seats mainly because of the inability of the curriculum to meet the industrial requirement. Therefore quantum of refinement required in curriculum is more for diploma courses. Diploma courses of general nature should be converted to specific nature depending upon the local requirements. A continuous revision can only meet the industry requirement.

2.8 Industry and institute Interaction

As already mentioned, interaction between industries and institutes is producing fruitful results. To a large extent domain of interaction is limited. Still it is requires to involve industries from all the areas. This is the most important key issue, which can bring the real value and quality to the technical education. Industries are still reluctant to involve education institutes in the research and development. Primary reason for non-involvement is due to the limitations and approach of the institutes. Autonomy imparted to the institutes may remove such hurdles. Also research activities in the institutes are required to be oriented towards the industrial problems. A large number of industries in India are not research oriented, which is also the one of the major reason for lesser industry and institute interaction.

Therefore to increase real and productive interaction institutes research activities must be based on the industrial problems. Once this process is started, industries confidence will also increase and result into more fruitful interaction.

3. CONCLUSION

Managers of the technical education are facing the various challenging issues to ensure quality in technical education as well as to meet the industrial requirement of qualitative and specialized manpower. It is felt that emphasis on research activities, which are oriented towards developing the new products and process, will raise the quality of education. It is also felt that autonomy will ensure that customers (students) requirements are fulfilled to pursue degree and diploma courses with improved quality.

4. REFERENCES

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