

The Quality Improvement Programme

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The origins of the Quality Improvement Programme (QIP) are traced in this brief review of the principal activities under QIP. The principal conclusions and recommendations of two earlier reviews and of a recent national review are summarized and discussed. A recent brainstorming session served to focus attention on the future directions for QIP. A SWOT analysis identifies the principal positive and negative features and prospects.

THE NATURE AND SCOPE OF THE QUALITY IMPROVEMENT PROGRAMME (QIP)

THE QIP of the Ministry of Human Resource Development (MHRD) has been in existence for 20 years. One of the principal objectives of this programme has been the institutional development through individual development by upgrading the expertise and capabilities of faculty members of India's degree-level engineering institutions.

Before the advent of this scheme, faculty members of degree-level engineering institutions invariably had to go abroad for their doctoral degrees; most of them were deputed under international schemes such as the Colombo Plan (to the USA), the Commonwealth Fellowship Scheme (to Commonwealth countries, but principally to the UK), the German Academic Exchange Service (to West Germany), etc. The Indian Institutes of Technology, which had specific bilateral co-operation with different countries, sent their faculty members to the respective partner countries for postgraduate studies. This policy catered for only a small number, and thus with the rapid growth in the number of engineering colleges, the QIP was conceived.

By 1970, it was recognized that there was a core group of (at least) seven institutions—the five IITs, the Indian Institute of Science and the University of Roorkee—which had built up resources in terms of infrastructure, faculty and services comparable to those available in advanced countries, and that these must be utilized by the other, less-endowed institutions. This would also be a cost-effective way of upgrading the qualifications of faculty members. The government thus launched the scheme, placing the responsibility of implementing it with the core group, which have come to be known as the QIP Major Centres.

There are at present three principal activities under the QIP:

1. provision of opportunities for faculty members of the AICTE (All India Council for Technical

Education)-recognized engineering colleges to improve their qualifications;

2. organizations of short-term courses to serve teachers at identified QIP centres;
3. curriculum development in specific branches of engineering.

The QIP has provided sterling service to many of India's engineering institutions by elevating the level of academic performance of a large number of teachers. By and large, it may be said that the QIP is one of the most successful programmes launched by the MHRD, and it has largely fulfilled the perceived objectives.

Under the qualification improvement aspect, faculty members of AICTE-recognized engineering colleges are admitted through a national selection process administered by the QIP Coordination Committee to the M.Tech/ME programmes and the Ph.D. programmes at the seven major centres and about 20 other minor centres, which have been recognized as possessing the requisite facilities and expertise. Annually, approximately 120 admissions are made to the Ph.D. programmes, and 150 to the M.Tech/ME programmes. The QIP Coordination Committee meets about six times a year to discuss policy matters and to implement the different schemes.

EARLIER REVIEWS OF THE QIP

There have been two earlier reviews of the QIP—in 1978 and 1986. Some of the recommendations resulting from them are summarized below:

- steps to enable the auditing of relevant courses at the QIP centres by engineering college teachers for one or two semesters (no credits; only for knowledge's sake);
- opportunities for postdoctoral research;
- taking back equipment fabricated at the QIP centre during Ph.D. work to the parent institution;

- reinvasion for short periods of up to 3 months;
- shift emphasis from individual development to institutional development;
- evolve an integrated approach toward institutional development with the active involvement of the parent institution, e.g. in the choice of topic for Ph.D. research;
- short-term training in industry for teachers;
- advance admission of Ph.D. candidates one year ahead of regular admission;
- housing facilities for QIP scholars, particularly for married scholars.

Some of these recommendations have been implemented, e.g. taking back equipment fabricated at the QIP centres to the sponsoring institutions, reinvasion of QIP Ph.D. scholars, short-term training in industry, and advance admission of Ph.D. candidates one year ahead of actual admission. During this period, the candidate is expected to make at least four visits to the institution in which he/she is offered admission, for a total period of about 60 days, with the principal objectives of fixing up his/her area of research, identifying the guide, and starting preliminary work, including a literature survey. The final offer of admission will be made on the basis of the performance of the candidate during this period of advance admission.

RESULTS OF A RECENT NATIONAL REVIEW OF THE QIP [1]

With the principal objectives of assessing the effectiveness of the QIP system as it is currently functioning, and to suggest new policy initiatives, the national QIP Coordination Committee recently undertook a questionnaire-based national survey. This was intended to provide feedback information on the different activities under QIP in order to strengthen the deserving ones, weed out those that are not fulfilling their stated objectives, and initiate new, innovative programmes. The target population, sample size and design of the questionnaires were arrived at after considerable deliberations.

Three different questionnaires were prepared for the principals, research supervisors and past and present QIP scholars. Responses were received from 75 principals, 104 research supervisors and 121 QIP scholars.

At the outset, it was also desirable to identify some indices of performance of the QIP scholars, and also to formulate means of quantifying these indices, before preparing the instruments of assessment to determine improvements. The improvement required is in the performance of engineering teachers in their multiple roles after the participation in the QIP scheme. It is recognized at the outset that this is an in-service intervention during the career of teachers, who are by and large highly motivated and committed. What is tacitly assumed is that the acquisition of a higher degree would

automatically confer on the teachers the necessary qualities successfully to discharge their multiple responsibilities and perform better. Of course, this assumption is also the basis for hiring new faculty members on the strength of their Ph.D./M.Tech. degrees. The indices of performance were drawn from the multiple roles of teachers, while it must be admitted that the objectives are only implicit, and probably not deliberately pursued. The survey was aimed at identifying strategies to set right any imbalances and introducing any alterations or corrections in order to achieve the desired objectives.

Principal conclusions

- The QIP has definitely resulted in substantial improvement in at least some areas of institutional development. It has created a great deal of awareness among the institutional heads and faculty members about their goals and roles.
- By and large, the majority opinion is that the QIP should be continued, largely as it currently exists; the facilities offered by the QIP at present appear to be effective and adequate.
- There appear to be a perceptible improvement in the performance of faculty members undergoing the QIP in the spheres of teaching undergraduate courses and guidance of project work. There was negligible improvement in curriculum development and laboratory instruction.
- By and large, all categories of respondents believe that the QIP contributes significantly to the various aspects of institutional development.
- Some doubts have been expressed about the effectiveness of the recently introduced 'advance admission' procedure for Ph.D. candidates.

Principal recommendations

- In addition to opportunities for acquisition of advanced degrees, it is necessary to provide other opportunities to enable teachers to acquire the requisite knowledge, skills and attitudes for performing better in their multiple roles.
- The number of major and minor QIP centres and the number of Ph.D. and M.Tech. places may remain substantially the same as at present. This takes into account the necessity for quality control and the inability of many minor centres to attract candidates.
- There is an urgent need to increase the number of short-term courses in emerging areas, thrust areas and pedagogical techniques. While these courses are now invariably conducted at the major centres, it is suggested that some of them should also be offered in other institutions, jointly co-ordinated by faculty members of the major centres and those of the host institutions. Additional funds are required for this purpose from the MHRD.
- It is desirable to initiate part-time registration possibilities for faculty members from other institutions at the QIP centres.
- Opportunities should be provided for reciprocal

visits of former QIP scholars and their guides between the institutions of the former and the latter. This will promote joint research, joint conduct of short courses, joint consultancy, etc. The QIP Coordination Committee has recently worked out details of such a 'revisitation scheme'.

In summary, this survey has not really thrown up any radically innovative strategies for improving the QIP. Some suggestions for minor modifications/additions/deletions are offered, the most important of which are:

- part-time Ph.D. registration;
- more short-time courses;
- additional areas for research;
- revisitation schemes.

RESULTS OF A RECENT BRAINSTORMING SESSION ON FUTURE DIRECTIONS FOR THE QIP [2]

A brainstorming session was organized by the QIP Coordination Committee on 19 April 1992, with the objective of eliciting ideas, views and opinions from distinguished academicians who have all contributed in some way or the other to the QIP over the years. The principal conclusions and recommendations are summarized here:

Conceptual features

- The QIP has been of immense benefit in enhancing the level of performance of a large number of engineering teachers over the past two decades.
- There is a need to define quality in the context of institutional and individual faculty development. Only then can strategies be identified for improvement of quality.
- Currently, there appears to be a mismatch between the goals of institutions and individuals. This mismatch must be removed, and an integrated programme of institutional development must be worked out.
- The value addition to the QIP scholars as a result of their work in the QIP centres must result in better and more consultancy, sponsored R&D, publications, and an improvement in the quality of teaching.
- The QIP centres should perceive the activities under the QIP in the proper perspective, and not compare them directly with their regular programmes. The QIP should be looked upon as a national responsibility and challenge, with the broad objective of improving the quality of engineering education in the country through valuable inputs to the sponsoring institutions.
- It may be a better idea to recruit Ph.D.s and M.Tech.s as teachers, rather than appoint teachers without these qualifications and then send them to QIP centres to upgrade their qualifications. The QIP centres may then concentrate on strategies for improvement of the quality of

teaching and instructional materials and methodologies.

- The QIP should not be viewed as the only mechanism for improving the quality of engineering institutions. Other avenues and strategies must be formulated for this purpose.
- It is essential to review critically the status of engineering education in the country so that the strengths and weaknesses of the existing programmes can be evaluated. This will provide information on the types of programmes, such as the QIP, that should be additionally undertaken.
- Additional inputs must be obtained from industry and other users of engineering graduates in order to redefine the obligations of engineering teachers.

Future needs

- Very soon, a large number of self-financing colleges will obtain AICTE recognition. Consequently the number of teachers seeking QIP seats for Ph.D. and M.Tech. degrees will increase steeply. The QIP system must be prepared to cater to this increasing demand.
- Substitute teachers must be provided to engineering colleges in order to take up the teaching load of those who are deputed under the QIP; their salaries should be met through the QIP.
- In view of the large intake of B.Tech. graduates as teachers in engineering colleges, the number of M.Tech. seats under the QIP must be increased.

Proposals for new QIP activities

- New M.Tech. programmes must be initiated in areas such as mechanical engineering education, electrical engineering education, etc., to combine technical content and pedagogical techniques.
- Educational research and training must be promoted in the engineering colleges, with appropriate support by the QIP centres.
- It must be examined whether part-time registration of faculty members of engineering colleges at QIP centres would be beneficial. If both this scheme and the regular QIP are simultaneously available, there would be a tendency for sponsoring institutions to prefer their teachers to utilize the former.
- Opportunities for auditing full-semester courses at QIP centres will be more effective than the present short-term courses.
- It is necessary to create and maintain a database of the needs and objectives of different institutions in teaching, consultancy, R&D, etc. and also the expertise and facilities available at the QIP centres, so that a good match may be established.
- Programmes must also be organized for developing academic leadership and capabilities for management of engineering institutions.

Modifications to the present QIP

- It has been the experience in most QIP centres that the normal period for completion of a Ph.D. by regular (non-QIP) scholars is of the order of four years. In this context, the QIP Ph.D. duration may be increased from the present three years to four years.
- The present advance admission scheme does not appear to be effective, for several reasons. For example, the parent institutions are able to depute the scholars only during the winter and summer vacations. During this time, in many cases, the prospective guides are not available. Instead of the advance year, the QIP scholars would benefit more if the duration were increased to four years.
- The strategies for formulating changes in the present QIP system must include both marginal changes for short-term benefits, and also major changes for long-term benefits.

Curriculum development activities

- The mechanism for updating curricula must be strengthened. In this context, the Curriculum Development Cells at the QIP centres must play an active role, involving the teachers from the engineering colleges in their vicinity, and also practising engineers from industry.
- The QIP centres must also produce innovative textbooks and multimedia resource materials.
- The role of laboratories must be strengthened, and there is a lot of scope for the QIP centres in this regard. For example, they could provide information on the availability of equipment, design of experimental programmes, innovative open-ended experiments, etc.
- There is a need for examination reforms, including innovative strategies for student assessment.
- Topics in educational technology and curriculum development should be offered as short-term courses.

Post-QIP schemes

- Strong post-Ph.D. linkages with QIP centres should be promoted. Opportunities must be provided for QIP scholars to maintain academic contact with their QIP centres after graduation.
- In order to improve the quality of R&D in the engineering institutions, it is desirable to have joint proposals between the QIP scholars and their guides to be submitted to national funding agencies for support.

Role of parent (sponsoring) institutions

- In the selection of QIP scholars for sponsorship, seniority should not be the consideration, but the aptitude and motivation of the scholars, and the potential utility for the institution when they return.
- The parent institution should evolve plans and strategies for making effective use of the QIP scholars on their return. The current attitude of treating the sponsorship as a passive, routine affair must be changed.

- The parent institutions must demand accountability and enhanced performance from the returning QIP scholars in terms of teaching effectiveness, sponsored R&D, consultancy, continuing education, undergraduate and post-graduate project work, etc.
- The engineering colleges must ensure that the areas of work of the QIP scholars dovetail into the institutional plans and activities. They must therefore demonstrate more commitment in sponsoring the QIP scholars and designating their work areas. On their return, the colleges must strive to provide and promote an atmosphere and support conducive to the pursuit of meaningful R&D and consultancy.

Assistance to the polytechnic education sector

- There is an urgent need to initiate the QIP for polytechnic teachers, particularly in view of the requirements under the new AICTE scales for the heads of the department to possess post-graduate qualifications.
- There is a tremendous opportunity existing now for making significant contributions toward polytechnic education, particularly in view of the World Bank's massive assistance programme. The engineering college system must involve itself in this national effort. The responsibility for co-ordinating this activity may be entrusted with the Regional Engineering Colleges (RECs), which have now developed considerable facilities and expertise.

A SWOT ANALYSIS OF THE QIP SYSTEM*Strengths*

- Sustained financial support from the MHRD.
- Good and sustained demand from engineering colleges. (This is possibly due to the promotional policies which make the acquisition of advanced degrees a prerequisite for promotions.)
- Academic interaction between the QIP centres and the other engineering institutions in the country.

Weaknesses

- Frustration created in the teachers, on return to their parent institutions, because of lack of opportunities (in terms of graduate students, infrastructure, time) for sustained research work.
- Lack of appreciation of the benefits of the programme by some principals and directors of technical education, whose co-operation is difficult to get.
- A (somewhat) decreasing level of enthusiasm on the part of the major centres, who find the quality of the QIP Ph.D. and M.Tech. entrants inferior to that of their regular students.

Opportunities

- Facility for engineering teachers to conduct research and obtain a Ph.D.; and to obtain an

M.Tech. and thus become eligible for promotion.

- Possibility of institutional development through the efforts of the QIP participants.
- Opportunities for inter-institutional academic interaction between the QIP centres and other institutions.

Threats

- Dissatisfaction of QIP centres and guides with the quality of input.

- Frustration of QIP scholars on return to their parent institutions, because of lack of opportunities, facilities, administrative support, etc.
- The perception of engineering institutions that nomination as a QIP centre is a seal of recognition of quality, or attainment of a higher status, rather than exploring other avenues for taking up M.Tech. and Ph.D. programmes.
- Lack of adequate finances in the future.

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