TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME

(A Govt of India Programme Assisted By World Bank)

Assessment of Faculty Development/Training under TEQIP and Approach to Scale-up for Future: A Study

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Table of Contents

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1. Executive Summary

The World Bank assisted Technical Education Quality Improvement Programme (TEQIP) which was started in 2003 has given major focus of attention on faculty development and training to meet the overall project goal of upgraded teaching-learning process. 127 Institutes throughout the country were selected for TEQIP support. Subsequently the National Project Implementation Unit (NPIU) has conducted a study to assess the effectiveness of the programme and to scale-up for future. The study was conducted during October 2008-February 2009 with an objective to assess the gains in faculty development/training during TEQIP project, to identify the reasons for deficiencies noticed in meeting the desired objectives for faculty development, to identify best practices for faculty development/training in the project, and to recommend actions for scaling-up for faculty development/training and making the process more effective in future. For the assessment, 35 representative institutions were chosen and the assessment was conducted as per the guidelines and format provided by NPIU. The assessment was done through visits by the assessors appointed by NPIU at the chosen institutions. The assessors have subsequently submitted reports to NPIU on their findings. The summary of these assessment reports is presented in this Section.

It was noted by the assessors that the institutions have been engaged in faculty development/training programmes for many years, even in the pre-TEQIP period. But this was not a well-planned activity. However, this activity is now properly oriented, funded and strengthened under TEQIP, resulting in the institutions getting benefited from the outcome. In general, it was observed that the progress of TEQIP activities at many of the Institutes seems to have been rather slow in the initial years due to various reasons. However, subsequent progress was observed to be quite good.

At majority of the institutions, a comprehensive and systematic Training Need Assessment (TNA) based on the needs of the departments had not been carried out. While only a few institutes followed the NPIU format exactly, at many institutes the TNA was sketchy and was done on an ad-hoc basis without following any scientific and/or systematic approach. In view of this, it is necessary that the TNA activity needs to be fine-tuned and microscopic analysis needs to be carried out at departmental level to improve its effectiveness. The TNA format provided by NPIU needs to be simplified.

Almost at all institutes, initially the number of faculty members undergoing training was low. However subsequently the number had improved and in general, it was observed that 75-100 % faculty members had undergone one or the other training and by and large most of the faculty members have been covered under various training programmes. At number of institutes a gap was

observed between the total number of faculty members identified after TNA and the actual number who finally went for training. The slippage was largely due to clash of the timing of their commitment at institute with the timing of the training programme.

The institutions have been observed to get substantial gains as a result of the faculty development/training initiatives taken up under TEQIP in the last few years. From the interactions with the faculty members, it was noted that most of the faculty members were happy about the programme in general. The significant gain has been achieved in qualification up-gradation. Notable gains at faculty members' level in the departments are higher level of interest in and commitment to teaching and student related tasks and higher competence in guiding and advising students.

The TEQIP programme has resulted in motivating the faculty members to take new initiatives and start certain programmes/activities in their own institutes. Large number of faculty members has initiated steps to upgrade their qualification. Many institutes have initiated in-house programmes for the benefit of the faculty members and conducted conferences and workshops at national as well as international levels. A number of institutes have established contacts/signed MoUs with universities/ research laboratories for faculty development.

During the assessment of the institutions covered in the present study, a number of deficiencies were also observed. As stated earlier, in general TNA was not carried out in a systematic and scientific manner due to various reasons. The faculty development programme at many institutes had been usually a class room exercise with less industry related involvement/contents. At number of institutes, a wide gap was observed between the TNA and actual deputations of faculty members due to clash of timing of training programmes with the academic calendar. Also TEQIP could not lead to better consultancy output primarily due to lack of proper incentives to the faculty members. One important deficiency was that faculty members at few institutes could not participate/present papers in conferences/programmes abroad due to State Govts' bureaucratic policies.

After analyzing the findings of the assessors, a number of recommendations have been made in order to scale-up the programme and also to make the faculty development/training more effective.

2. Introduction

Recognizing that high quality manpower plays a major role in economic development and export of technology and services, and the growing demand for Indian professionals from all parts of the globe including developed countries, the Govt. of India gave high priority to human resource development in engineering and technology. During 1991-2007, Govt. of India supported the State Governments through three Technician Education Projects financed by the World Bank, which helped to strengthen and upgrade the system and thus benefited a large number of institutes/ colleges in the country.

The TEQIP is one such programme aimed at improving the technical education in the country. It is a centrally coordinated central and state sector project with a vision of providing freedom to institutions to develop their own institutional projects. Thus the programme has followed the bottom up approach and not the top down activity in its implementation. The broad objectives of the programme are: i) to create an environment in which engineering institutions can achieve their own set targets for excellence and sustain the same with autonomy and accountability, ii) to support development plans including synergetic networking and services to community and economy for achieving higher standards, and iii) to improve efficiency and effectiveness of the technical education management system in the State institutions/Central institutions. The programme aims at promoting academic excellence by starting new programmes specially PG programmes in emerging areas, revision of all curricula and updating of syllabi, accreditation as a mark of quality, increasing the intake for Master's/PhD programmes, improving the student evaluation system, and improving the faculty competence.

For the programme, 127 institutions were selected from 13 States including 22 private institutions, 18 Centrally-funded Institutions, 68 State Government-funded institutions and 19 polytechnics, on a competitive basis.

The review reports of faculty development activities from the start of TEQIP have brought out certain issues that were not conducive to achieving the goals of the programme. Therefore it was felt necessary to assess the effectiveness of the programme and also to find measures to scale-up for future. For this purpose, the National Project Implementation Unit (NPIU) has conducted a study on assessment of faculty development/training scheme under TEQIP with an objective to assess the present status and evaluate holistically the strategy and performance measures for upgrading the quality of teaching-learning process. For the assessment, 35 representative Institutions (**Appendix A)** were chosen and the assessment was conducted as per the guidelines and format provided by NPIU (**Appendix B)**. The assessment of each of the chosen Institutes was done by an assessor, who in turn submitted his findings in a prescribed format to the NPIU. The main elements of the study were:

(a) **To describe, analyze, and assess the faculty development/training carried out under TEQIP:** The various aspects covered under this element were use of training needs assessment, method for identification of training needs, classification of training in the training plans, classification of actually implemented training, assessment of difference between needs assessment versus planned training, and assessment of difference between planned versus implemented training.

(b) **To identify reasons for deficiencies noticed in meeting the objectives:** In this part, an assessment of obstacles faced in either planning or implementation of faculty development was to be covered.

(c) **To identify good and effective practices at the institution and state level:** This section was to address how institutional and state policies and structures have overcome the obstacles and also to identify the not-desirable cases of what not to do.

(d) **To recommend based upon the analysis, obstacles and best and worst practices what can be done to scale-up faculty development and make it more effective:** This element includes recommendations to scale-up at the institution, State and Central levels.

To facilitate the assessment, data available with TEQIP was made available to the assessors. The data included Concise Institutional Proposals (CIPs), list of faculty members from 2004 onwards, copy of the TNA conducted by the institution from 2004 onwards, copy of Annual Staff Development Plan from 2004 onwards, details of faculty training programmes actually held from 2004 onwards, list of teachers who underwent no faculty training programme since 2004, list of fresh teachers from 2004 onwards, summary sheets of responses of students and faculty members to the questionnaires during performance audit from 2007 onwards, output and outcome indicators from 2004 onwards and data on year-wise expenditure incurred on training by the institutions since 2004. Apart from this data, the assessors conducted group discussions with faculty members, Heads of Departments, TEQIP Coordinators, Conveners who have arranged in-house training by in-house experts, Directors/Principals and members of Board of Governors of the institutions.

The assessment covered all faculty training/development activities carried out by the institutions during TEQIP period, i.e., since 2004. The short term training/development activities covered under the assessment include conferences/workshops, attachment to institutions/organizations/industry (India and abroad) for upgrading professional knowledge/research competence, study tours and management development programmes. The long term training/development activities covered include attachment to institution/organization/industry (India or abroad) for upgrading professional knowledge/research competence in emerging and frontier areas, Continuing Education Programmes, and qualification up-gradation programmes.

In general, the procedure followed by the assessors was as follows. The assessors visited their respective institute/college and studied various documents stated earlier. In addition, focused group discussions were held with the various Heads of the Departments (HODs) and representative group of faculty members and undergraduate (UG), postgraduate (PG) and research students. During discussion, the assessor distributed response sheets to the participants, who in turn, submitted their sheets back to the assessor after filling them. Discussions were also held with the members of Board of Governors in few cases. Each assessor has summarized the assessment outcome under various headings such as (a) Analysis of Training Need Assessment (TNA), (b) Status of training carried out in various categories till Aug 2008, (c) Perceived gains, (d) Successful and effective practices and initiatives, (e) Identifying deficiencies and assessment of reasons for the deficiencies and (f) Recommendations for scaling up and making faculty training/development more effective; and submitted the findings in the form of a report to NPIU.

The institutes selected for the study were chosen from all regions and also from all categories such as Central Govt-funded, State Govt-funded and aided and self-financing private institutions, Polytechnics; institutes offering UG, UG and PG and UG, PG and PhD programmes, autonomous and non-autonomous institutions. Many of these institutes are well-established. From the list of institutions assessed for this study as given in Appendix A, the profiles of the institutions are given in Figure 1 and it can be observed that all types of educational institutes have been represented in this study.
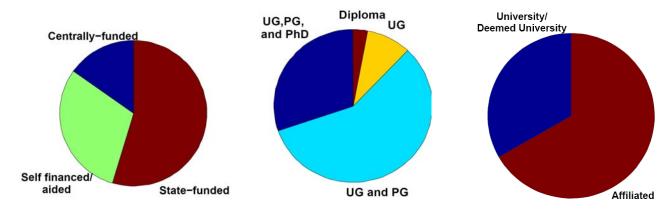
Figure 1: Profile of institutions/colleges/universities selected for the study

In general, it was observed that the progress of TEQIP activities at many of the institutes seems to have been rather slow in the initial years due to various reasons such as long wait for Board of Governor's approval to receive/utilize TEQIP grants, initial difficulties in understanding objectives of TEQIP and planning to meet the desired goals and objectives, shortage of faculty/staff members, need to strictly follow the bureaucratic procedures of state government irrespective of simplified procedures in the NPIU guidelines, non-availability of competent faculty members at some institutes. However, subsequent progress was observed to be quite good. The progress of faculty development programme depends on academic ambience and pursuit, encouragement to research and development activities and setting up of necessary facilities for the same, active interest of the management in the primacy of the faculty development, understanding the various components of faculty development, interest of the coordinator, and support from the head of the institute. However, the assessors found that in general the faculty members were very happy with the faculty development programme and highly appreciated the help given by TEQIP in improving the academic excellence of their institutions.

This report summarizes the findings of the assessment carried out by the various assessors at the selected 35 colleges/institutes.

3. Analysis of TNA

3.1 Analysis of TNA: The TEQIP has given major focus of attention on faculty development and training. The Training Need Assessment (TNA) is a crucial component of and a contributor to the excellence of a technical institute. The assessors found that in the pre-TEQIP period, institutions either did not have any practice of preparing annual training plans or have seldom prepared such a plan for their faculty members. This used to depend on a faculty member's individual initiative. The faculty members were deputed to various training programmes based on the request of the faculty members concerned and the recommendation of the Head of the Department (HoD). Moreover, there was virtually no possibility at the institutions to depute interested faculty members to such programmes in large numbers presumably due to limited budgetary provisions and high level of

academic load on the faculty members because of faculty shortage. However, this situation has changed for better under TEQIP and the institutions have been putting efforts in preparing TNA annually since their selection under TEQIP.

In few institutes, the TNA was prepared as per the format supplied by the NPIU. The TEQIP coordinators and the HODs jointly associated in preparing TNA and getting the same approved from Directors/Principals or Deans of the institutes. Inclusion of topics in TNA was largely based on faculty qualification, their need, aptitude and interest and discussions at the departmental level. At some places, the TNA has been filled up with areas of training/research collaboration in general. Areas are identified first and faculty members are matched afterwards. All faculty members prepared their TNA. Training plans, their classification and identification of faculty members to attend the programmes were based on departmental discussions bearing in mind the likely benefits to the Department/faculty members. In many cases Departments were unable to depute faculty for long (> 1 week) training during term time, due to tight teaching schedule; however no such problem existed during vacation periods. Also planned courses being not always available in the required time slots, there was general reluctance among faculty members to attend courses at other times due to the need for permission to avail leave and problem of additional classes to be taken on return. Hence although planned methodically, strict adherence to the same was difficult.

In few institutes, the TNA was carried out at the department level by circulating a questionnaire on the training programmes that each faculty will be interested in attending. The HoD prepared a consolidated statement and sent the same to the Principal for approval.

In a number of institutes, TNA was prepared department-wise by the concerned Head of the Department in consultation with respective faculty members. Such department-wise documents are then centrally compiled for preparation of the entire TNA for the whole institute. The document is prepared identifying departmental needs, faculty expertise and also even need for soft skill development.

In few institutes, the yearly TNA was prepared by inviting applications from the teachers and matching the same with the requirements of the department and the training calendar is finally drawn and implemented. In few cases, it was felt that faculty members did not fully understand TNA-how to prepare this, how to set goals, and so they needed an awareness programme. As there was no proper understanding of TNA, it was sketchy and ad-hoc. Thus at some places, comprehensive TNA based on the needs of the department and interest of the faculty members was not carried out. As and when an announcement on a training programme came to the institute/department, it was circulated among the faculty members and those who expressed willingness were sent for the programme. One suggestion that has emerged from the reports of 5 assessors is the necessity of simplification of the TNA format provided by the NPIU. At one institute, during focused discussions the Heads of Department expressed a view that although a formalized TNA existed, it was more in the process of according approval. The extant ad-hoc system of TNA needs to be supplanted by more effective practices, preferably by a third party review from outside the organization to allow cross-sectoral learning.

3.2 Concluding Remarks: At majority of the institutions, a comprehensive and systematic TNA based on the needs of the department has not been carried out. While only a few institutes followed the NPIU format exactly, at many institutes the TNA was sketchy and was done on an ad-hoc basis without following any scientific and systematic approach. In view of this, it is necessary that the TNA activity needs to be fine-tuned and microscopic analysis needs to be carried out at departmental level to improve its effectiveness. The TNA format provided by NPIU also needs to be simplified.

4. Status of Training Carried out in Various Categories till Aug 2008

4.1 Status of Training Carried out in Various Categories till Aug 2008: In general, for the year 2004-2005 which is the starting data point in this study, the faculty training was low. Under TEQIP, the faculty members got an opportunity to get exposed to various types of trainings activities. These include short and long term programmes for knowledge and qualification up-gradation, laboratory training, research methodology, professional work, institution/department management, institutional reforms and the like. The training was mostly of formal class room type. Besides, the training programmes have also covered conventional and new pedagogical techniques and exposure to modern educational aids/technologies. Few institutes conducted national as well as international conferences and workshops. The faculty members were also facilitated to attend national/international conferences and present their papers. These measures have attracted widespread attention among faculty members and enhanced their satisfaction level to a great extent. Major areas of training/development of faculty members covered technical skill development, and managerial capacity development. However, in some State Govt-funded institutes, all deputations were restricted to events in the country only, as none was permitted to attend programmes abroad, including for presentation of papers at well-known conferences; due to state government policies.

At few institutes, faculty development programmes included qualification improvement, long term visits to other institutions, visits to foreign universities, visits to research laboratories, in-house training programmes, and training programmes conducted outside. In few cases, programmes for improving communication skills of faculty members were organized for those who were identified to be deficient in English language communication. A good number of senior faculty members were sent for management development programmes as well.

In TEQIP, a general trend indicates that the number of faculty members undergoing training programmes has steadily increased since its inception. A representative distribution of training programmes attended by various faculty members at MS Ramaiah Institute of Technology, Bangalore is shown in Figure 2. The type of training programme associated with various stacks shown in Figure 2 is given in Table 1. One can observe that the total number of faculty members undergoing the training programmes has been increasing steadily.

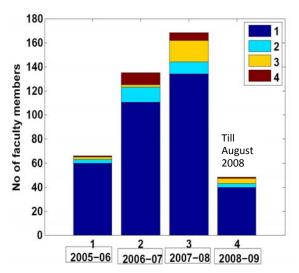|	Type of training
1	Conferences/Workshop
2	Attachment to Institution/Industry
3	Study tours/Exposure visits
4	Management Development Programme

Table 1: Types of training

Figure 2: A representative distribution of training programmes (2005-2008)

As another example, the faculty strength and the number of faculty members who have undergone training under TEQIP since 2005 at the LD College of Engineering, Ahmedabad are shown in Figure 3 and it can be observed that while the faculty strength remained more or less the same, the number of faculty members who have undergone training has increased steadily from 2005 to 2008. One can also note that in the year 2007-08, some faculty members had undergone more than one training programme resulting in the number of faculty members trained being more than the strength of the faculty members.
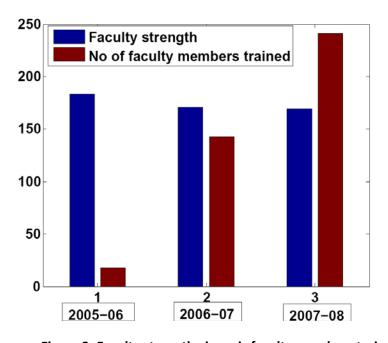

Figure 3: Faculty strength vis-a-vis faculty members trained

Interactions with the faculty members (a small percentage of the total faculty members) who did not participate in any training or faculty development activities brought out certain trends. Firstly faculty members belonging to this group were mostly at senior level and many of them had genuine concerns regarding health and age factors. Few stated the low standards of the training programmes as the reason for not participating in them. Teaching loads and alternate arrangements to be made for taking their classes during their period of absence were also cited as reasons for not participating in the programmes. However, they agreed on the need for periodical training to improve their teaching skills.

At a few places, it was observed that the total number of faculty members identified after TNA and the actual number who finally went for training were not the same. The slippage was due to the non-availability of programmes at a time suitable for the faculty members or inability of the faculty members to stick to their original commitment. However, interestingly, there is an increasing trend in the number of training programmes from 2005 to 2008.

In general, it was observed that 75-100 % faculty members had undergone one or other training programme and by and large most of the faculty members have been covered under various training programmes.

4.2 Concluding Remarks: Almost in all institutes, initially the number of faculty members who have undergone training was low. However, subsequently this number has improved and in general it was observed that 75-100 % faculty members had undergone one or other training and by and large most of the faculty members have been covered under various training programmes. At a number of institutes, a gap was observed between the total number of faculty members identified after TNA and the actual number who finally went for training. The slippage was largely due to clash of the timing of their commitment at institute with the training programme timing.

5. Perceived Gains

5.1 Perceived Gains: The institutions have been observed to get substantial gains as a result of the faculty development/training initiatives taken up under TEQIP in the last few years. From the interactions with the faculty members, it was observed that most of the faculty members were happy about the programme in general. The first gain is the attitudinal change, i.e., everyone feels training is essential for proper growth of a person and institution. The significant gain has been access to and understanding of very good institutions as well as qualification up-gradation. Faculty members who went for long term attachment training expressed great satisfaction at the benefit that they got in being associated with institutes of higher learning. It opened up new contacts for the faculty members to pursue their research and academic activities. The pedagogical training for fresh teachers has helped their level and style of teaching.
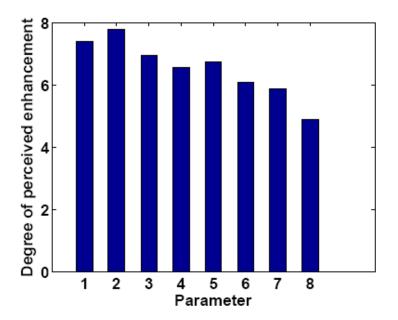
The gains perceived at the department and faculty members' levels as observed by the assessors are summarized below:

i. Higher level of interest in and commitment to teaching and student related tasks.
ii. Development of well-planned new laboratories, new experiments and exposure to better practical work.
iii. Better skill in academic management especially in guiding and advising students.
iv. Increased knowledge base and higher competence for teaching and project guidance.
v. Better confidence in academic innovation and initiation of programmes in new areas.
vi. Increased opportunities to improve qualifications/experiences in distinctive and specialized areas.
vii. Capacity enhancement to take up research/consultancy/extension activities.
viii. Better presentation skills in lectures/labs with focus on students' learning.
ix. Higher level of learned lectures and subject coverage leading to better satisfaction among the students.
x. Improved abilities to provide guidance on the state-of-the-art and future topics.
xi. Superior academic leadership.
xii. Better acceptance of a faculty member as a leader, mentor, advisor, guide and role model.
xiii. Improvement in communication ability, especially for the identified group of faculty members.
xiv. Formation of in-house development of faculty team capable of rendering soft skill training for the students.
xv. Development of core expertise in emerging areas.
xvi. Motivation for research related activities.
xvii. Improvement in quality of projects at UG and PG levels.
xviii. Increased opportunity and funds to travel abroad for presenting papers.
xix. Ability to offer new electives in some of the state-of-the art technology areas.
xx. Interaction with faculty members of reputed institutions leading to collaborative academic activities.

The assessors noticed that many faculty members have taken up training in the areas of interest to their departments and this increased their research output.

One very important gain for the faculty members from the long term training programmes those they had attended was establishing contacts with peers and exposure to modern developments in their fields of specialization.

Based on the data from the assessment reports of NIT Surat, DD University Institute of Technology, Nadiad, LD College of Engg, Ahmedabad, and Madan Mohan Malviya Engineering College, Gorakhpur, a finding on the (1) degree of enhancement perceived in faculty capabilities after training under TEQIP and (2) perception of need by newly recruited faculty members are shown in Figures 4 and 5 respectively. The faculty capabilities were defined/quantified in terms of various parameters given in Table 2. The faculty members were asked to state their degree of enhancement perceived with respect to these parameters on a 10 point scale. The degree of enhancement perceived is 7.4 in pedagogy, 7.77 in subject competence, 6.95 in laboratory development, 6.55 in research competence, 6.75 in management skills, 6.075 in continuing education, 5.875 in qualification up-gradation, and 4.875 in consultancy.

Figure 4: Degree of perceived gain

Bar No.	Parameter
1	Pedagogy
2	Subject Competence
3	Laboratory Development
4	Research Competence
5	Management Skills
6	Continuing Education
7	Qualification Upgradation
8	Consultancy

Table2: Parameters for evaluating faculty capabilities

Figure 5: Degree of perception of need

From figure 4, it can be noted that the faculty members benefited the most in subject competence (7.77) while the least benefit was obtained in consultancy activities. Also it is obvious that, in general the gains are quite satisfactory averaging at 6.53.

A finding for perception of need by newly recruited faculty members for the parameters stated in Table 2 is shown in Figure 5.

In general, the assessors have observed that there is appreciation of TEQIP's role in improving the quality of the faculty members through training programmes. During focused group discussions, the students stated that there was a significant improvement in quality of assignments, projects and lectures delivered by the faculty members who had undergone training or faculty development programme.

The students felt that familiarity of the faculty members with the latest computing hardware and software   has benefited them for their project work. The feeling among students was that training of

faculty members in delivery/communication skills and evaluation skills is necessary and that the faculty members have acquired better presentation skills and styles in the recent past due to the trainings. There was more emphasis on research while guiding the students. Higher level of learned lectures and subject coverage leading to better satisfaction among students was one major outcome of the training programmes.

5.2 Concluding Remarks: The institutions have been observed to get substantial gains as a result of the faculty development/training initiatives taken up under TEQIP in the last few years. From the interactions with the faculty members, it was observed that most of the faculty members were happy about the programme in general. The significant gain has been in qualification up-gradation. Notable gains at faculty member's level are higher level of interest in and commitment to teaching and student related tasks and higher competence in guiding and advising students.

6. Successful and Effective Practices and Initiatives

6.1 Successful and Effective Practices and Initiatives: The TEQIP programme has resulted in motivating the faculty members to take up new initiatives and start certain programmes/activities in their own institutes. One important initiative is in the area of qualification upgradation which has been done in a concerted manner at almost all institutes. In general, large number of faculty members have been deputed for long term training programmes which fetch them Masters' and Doctoral degrees. The initiative is commendable in a situation of faculty shortage in emerging and new disciplines.

At number of institutes, national and international conferences, seminars, and workshops have been organized apart from a number of students' seminars, technical symposia and project presentations, with the help of faculty members. Organizing these seminars and workshops has helped the faculty members in increasing their exposure to the emerging trends in various fields. To give an example, an International Conference on Advanced Communication Systems was organized for the first time at Government College of Technology, Coimbatore wherein about 250 participants from all over the world participated. Experts in the field of Advanced Communication Systems from The Netherlands, Germany and Switzerland were invited as resource persons.

One important outcome of the TEQIP is in initiation of inhouse programmes for the benefit of the faculty members. At MS Ramaiah Institute of Technology, Bangalore a total 28 tailor-made programmes were conducted to suit the faculty members' requirements. Experts from other institutions and industry were involved in conducting these programmes. At the National Institute of Engineering, Mysore a total 12 inhouse training programmes were conducted during 2005-08 in which faculty members from other engineering colleges also participated. At Siddaganga Institute of Technology, Tumkur, a one week inhouse course for faculty development programme was conducted at the beginning of every semester by each department involving outside subject experts and other

resource persons. This training, attended by all the faculty members in each department, gave the necessary exposure and depth of knowledge for teaching various courses effectively.

Another good practice followed by a number of institutes was to organize pedagogical training programme for all fresh faculty members on a regular basis. At the Maulana Azad National Institute of Technology, Bhopal, a practice of organizing pedagogical training to all the newly joined faculty members was followed. At Siddaganga Institute of Technology, Tumkur, a pedagogical training to all fresh faculty members has been organized on a regular basis. At GB Pant Agricultural and Technological University, Pantnagar, a long term programme on pedagogy was organized by the faculty members from University of Illinois, USA.

At few institutes, the TEQIP training has resulted in offering of   elective subjects in new areas. For example, at the Sant Gajanan Maharaj College of Engineering, Shegaon, Maharashtra, new electives in some state-of-the-art technology areas were introduced as a result of subject matter training. At IEM Kolkata, the Department of Computer Science has organized a finishing school programme for engineering graduates and the curriculum and syllabi have been finalized with the help of the leading Indian IT industry, the Tata Consultancy Services. At NIT Surathkal, two curriculum development workshops were organized inhouse separately for UG and PG courses which gave major impetus to adopt flexible curriculum for the courses offered. The Sree Chitra Thirunal College of Engineering, Thiruvananthapuram, offered new electives in some state-of-the-art technology areas as a result of subject matter training.

Some more initiatives and good practices consist of signing of MoUs with research laboratories and industries. Under the MoUs, some R and D projects and training programmes have been initiated. Also MoUs have been signed by few institutes with foreign universities for academic exchange. Research collaboration with and visits to other institutes were initiated by several institutes under the TEQIP programme. At Siddaganga Institute of Technology, Tumkur, an industrial competency laboratory to train students was established by the alumni of the college. In addition, MoUs were signed with Gas Turbine Research Establishment (GTRE), Bangalore and also with Tata Consultancy Services (TCS) under which some R & D projects and training programmes have been initiated. For academic exchange of students and faculty members, MoUs were signed with University of Memphis, USA, and RMIT, Australia. At the National Institute of Engineering, Mysore, inhouse training facilities for faculty members have been established in the college by industries such as Wipro, Eicher and Bosch-Rexroth. In addition, MoUs have been signed between the institute and Infosys, University of Minnesota, USA, for faculty development and with NAL for joint research projects. At the Government College of Technology, Coimbatore, a training programme on Embedded Systems was organized in collaboration with Vi-Micro Systems, Chennai. As a model of industry-academic collaboration, M/s Flextronics has established a Surface Mount Technology Laboratory worth Rs. 400 million at the College of Engineering, Guindy. A welcome initiative on the part of the state government came to notice in Himachal Pradesh wherein the Himachal Pradesh Government has sent the Director, Technical Education and Principals of TEQIP Institutions on a study visit to UK to broaden their vision.

At the University Institute of Technology-RGPV, Bhopal, a practice of recruiting a few research assistants by arranging their Fellowship from the TEQIP funds was started. These research assistants worked for their PhD and developed the necessary experimental facilities in the laboratories. After

completing their PhD, they may continue as regular faculty members at the institute. However, the facilities created by them will remain with the departments to be used by several students. This appears to be a good practice for creating a research culture. Due to lack of sufficient number of qualified faculty members, the institute has been appointing GATE-qualified MTech students to teach at the first year BTech level on a nominal hourly payment basis. The MTech time table for these teaching assistants is arranged in such a way that their teaching assignments do not interfere with the MTech class work. This practice is similar to the AICTE-approved method of using PhD students for 8-10 hours per week of tutorial/laboratory/drawing class assistance.

At Maulana Azad National Institute of Technology, Bhopal, a practice of arranging a technical training programme about the use of software available at the institute for all fresh and newly-recruited faculty members is followed. At Sree Chitra Thirunal College of Engineering, Thiruvananthapuram an inhouse software was developed for purposes such as laboratory experiment simulation, assistance for smooth conduct of university examinations etc.

At the National Institute of Technology, Hamirpur, initiative had been taken in identifying the needs for training to the organized and unorganized sectors of economy, as well as to the community around and the institute has conducted training as per action plan. The initiative has given the faculty members an insight into the problems of the community which can be addressed by the use of technology.

At few institutes, industrial training has been encouraged. For example, at DKTES' Textile & Engineering Institute, Ichalkaranji, Maharashtra, industrial training for faculty members during vacation for better exposure to latest industrial technology has been arranged. Also industrial visits of at least 15 days during winter vacation were made compulsory for the students.

At the College of Engineering Pune, a praise-worthy action taken by the administration is, constituting a committee of senior faculty members called "CAP-05 Knowledge Upgradation and Training" to devise means and methods to make the vision of the institute achievable in a finite period of time.

In effect, the TEQIP has motivated the institutes to initiate a number of activities that are supportive and necessary for the development of faculty members.

6.2 Concluding Remarks: The TEQIP programme has resulted in motivating the faculty members to take up new initiatives and start certain programmes/activities in their own institutes. Large number of faculty members have initiated steps to upgrade their qualification. Many institutes have initiated in-house programmes for the benefit of the faculty members and conducted conferences and workshops at national as well as international level. A number of institutes have established contacts/signed MoUs with universities/research laboratories for faculty development.

7.   Identifying Deficiencies and Assessment of Reasons Responsible for the Deficiencies

7.1 Identifying Deficiencies and Assessment of Reasons Responsible for the Deficiencies:
In spite of the best efforts of the institutions, the faculty development/training programmes have some deficiencies that came to light. The deficiencies observed by the various assessors and the reasons thereof are briefly summarized below.

In general, it was observed that TNA was done on an ad-hoc basis rather than following any systematic procedure. Several reasons have been attributed for this deficiency. At number of institutes, the TNA has not been understood in its proper perspective and there was no clear understanding as to what constitutes faculty development. The format of TNA supplied by NPIU was found to be rather complicated. Non-availability of information about the training programmes and their schedules has also come in the way of planning of proper TNA. Also the planning for Faculty Development Programme was not in line with TNA and duration was too short to meet the objectives.

In the faculty development programme, lack of industrial training by faculty members is another area that needs attention. It appears that industries are not usually keen to take faculty members for training, unless they get some benefit out of such association.

At number of institutes, a wide gap between TNA and faculty deputations has been observed even though enough budget was available. The clash of training programmes and academic calendar of the institutes was the main reason for this slippage. Sometimes non-availability of a training programme desired in the TNA has resulted in the concerned faculty member not undergoing training. General reluctance of faculty members for training during semester time, due to leave problems and need to take extra classes on return; have also contributed to the slippage. Institutional inability to match TNA with the training calendars of leading institutions was another important reason. The time-table of FDPs offered by various premier institutions was not available to the potential participants well in advance. The teaching commitments of the faculty members sometimes stood in the way for participating in such programmes. There was a lack of encouragement or incentives from the management in a number of institutions. Contract and ad hoc employees were not included in the training plan. Though specific data pertaining to gender inequality for training programmes are not available, women teachers find it hard to leave family for attending long term courses.

Training could have been more effective in greatly enhancing research/consultancy output of faculty members. There are several reasons for this gap. General preference of faculty members for short-term programmes has led to training inadequacy. On the other hand, there were few takers for long term training as such training programmes are not yet an institutional priority. No proper incentive/encouragement exists for faculty members to take up consultancy work due to unattractive provisions/policies of the institutes. This has been the main reason for low output on consultancy front. At some institutes, the main deficiency was the lack of adequate qualified faculty members in all the departments. Most of the faculty members were young and not very well-qualified. High attrition rate of faculty members was also one important reason for this deficiency on consultancy front.

At number of institutes, in-house strategy for faculty development/training is yet to receive the attention it merits. Also the culture of large scale deputation of faculty members for training is yet new and yet to take deep roots in these institutes. Lack of autonomy or limited autonomy of the

institutions also was responsible in fulfilling of the TEQIP objectives in its right perspective at several institutes. Inability of faculty members to participate/present papers in conferences/programmes abroad due to State Govt policies is one example in this regard. Limited academic flexibility due to rigid university structure also has contributed to some extent towards this gap.

7.2 Concluding Remarks: In general TNA was not carried out in a systematic and scientific manner due to various reasons. The faculty development programme had been usually a class room exercise with poor industry related participation/contents. At number of institutes a wide gap was observed between the TNA and actual deputations of faculty members due to clash of timing of training programme and academic calendar. The TEQIP programme could not lead to better consultancy output primarily due to lack of incentives to the faculty members. Faculty members could not participate/present papers in conferences/programmes abroad due to State Govt policies.

8. Conclusions and Recommendations for Scaling up and Making Faculty Training/Development More Effective

8.1 Conclusions: Many of the institutes have a good record of faculty development/training for many years, even in the pre-TEQIP period. However, this has been properly oriented, funded and strengthened during the TEQIP period. This activity has to be nurtured further, maintained and formalized in the post-TEQIP period as well. Although the progress of the TEQIP activities at many of the institutes was slow in the initial years, subsequent progress was observed to be quite good. It is too early to see the results of faculty development/training initiatives taken up under the TEQIP scheme. However, the initial outcome is indicative of a need to broaden/deepen training in all areas of academic work, like curriculum planning/design, course presentation/delivery/examinations etc. The initial results of faculty development/training programmes conducted under TEQIP are indeed encouraging. In general, the assessors have observed that due to the participation in the TEQIP, the faculty development/training programmes at the institutions got properly oriented, funded and strengthened. It was also noted that the faculty members and the institutions gained significantly as a result of the TEQIP. For example, the programme has given opportunity to the faculty members for up-gradation of their qualification, participation in national/international conferences and participation in various types of training activities making them better equipped professionally.

8.2 Recommendations: The faculty development/training activities in the phase-I of the TEQIP programme mainly included qualification up-gradation, conduct of in-house training programmes, participation in various short as well as long duration programmes, and participation, organization and conduct of national/international conferences etc. While these activities are important in the faculty development process, there exist scope in making the programme more effective by improving the existing activities and adding some more activities to it. Thus in phase-II, steps can be

initiated to improve the effectiveness of the TEQIP programme further and to make it more fruitful to both, faculty members as well as the participating institutions.

8.2.1. Recommendations for up-scaling training:

i. In order to have a proper TNA, the NPIU should facilitate in the preparation of a training manual. It should define what is faculty development, what are the different types of faculty development activities, where the opportunities are available, how does one conduct the training need assessment/analysis, what is the process involved in conducting the training needs, how does one prepare a training plan and orient it towards the goals of a department/institution, how does one assess the impact of training, and how does one use the output of training. The NPIU may set up a training portal which should contain information about training programmes, links to institutions, research methodology and other related information. Students' feedback may be used in the preparation of TNA. The format for TNA may be simplified. Provision can be made to post comments/suggestions on the NPIU webpage.

ii. Many of the faculty members being only under-graduate or post-graduate degree holders at present, the institutions have been encouraging them to take up higher studies/research either on part-time or full-time basis. This may be continued and strengthened further in the coming years, as this will give impetus to teaching and research activities, sponsored projects and consultancy activities by the faculty members and also for increasing their research publications in refereed Journals and thus improving the overall academic ambience of the institutions. The deputation of identified faculty members for acquiring Ph.D degree under Quality Improvement Programme (QIP) should be continued and stepped up to cover all the eligible faculty members in a planned manner. The institutions may like to make it mandatory for every faculty member to work towards improving qualifications up to Ph.D., attend faculty development/training courses periodically, and patent/publish research results.

In spite of the professional benefits that accrue through qualification up-gradation, there exist faculty members who are reluctant to do so due to variety of reasons such as lack of time, lack of funding, lack of incentives, age or health issues, non-availability of a programme desired, and not getting admission into the programme they desire. In phase II of the TEQIP, efforts may be made to address these issues. For example, frequently faculty members seeking admission in PG/Doctoral programmes at IITs/IISc, are not successful in getting admission in these institutes due to stiff competition and limited seats. To address this issue, the NPIU may approach the IITs/IISc with a request to grant admission to such faculty members in larger numbers. On the other hand, institutions should make efforts to ensure that the faculty members are partially relieved from their regular duties to facilitate completion of their higher studies. Schemes providing incentives for acquiring higher qualification may also be thought. To cite an example of such a scheme, the Defence Research and Development Organization (DRDO), Ministry of Defence, Govt. of India grants a fixed financial incentive to any individual who acquires higher qualification while in service. Finally the faculty members may be motivated to upgrade their qualification by making it a pre-requisite for their promotion/career advancement. Faculty members who express lack of time

as a reason may be motivated to take up the qualification up-gradation activity through part-time programme instead of undergoing full-time programme. To ensure proper funding for this cause, funds allotted for this purpose may be substantially increased.

iii. In the current study, the assessors have observed that the benefits of TEQIP are the least in consultancy activities, i.e., the TEQIP programme was not enough effective in motivating and promoting consultancy activities by the faculty members. One important reason for this was the lack of proper incentive/encouragement to faculty members for undertaking consultancy work. In phase-II, efforts may be made to address this issue. The institutions may be asked to look into this aspect and frame provisions/policies so that adequate motivation exists for faculty members to undertake industrial consultancy.

iv. The faculty development programmes conducted by many institutes are by and large class room exercise with less practical contents. The lack of industrial training by faculty members is another area that needs attention. These are important issues which should be addressed in phase-II of TEQIP. One reason for this shortcoming is that industries are not usually keen to take faculty members for training, unless they get some benefit out of such association. It is desirable to have training programmes more interactive and have more practical contents. Senior industry personnel/professionals should be associated with in-house training programmes and industry exposure to form an integral part of all such programmes. Training on engineering practices, industry practices, standards, quality etc. may also be encouraged. Compulsory summer and winter training of faculty members in industry may be introduced if required. The faculty members may be encouraged to take up collaborative projects with the industrial personnel to provide solutions to problems in industry. Postgraduate and research students too can interact with industries and take up project work involving industrial problems. In fact, in this study, the assessors have found that such an interaction has already been established in some institutes under TEQIP and such a trend is required to be strengthened.

v. The institutions have a large number of Research/Post-Graduate students on their roll. This group may be assigned specific academic duties regularly under the guidance of senior faculty members, which would help in getting them properly trained/oriented. Such training programmes could be launched in-house during vacation periods. The students can be of great help in contributing to research projects undertaken by the faculty members, thus getting themselves enriched in the process.

vi. The institutions should identify new and upcoming research areas and conduct more in-house training programmes for the same.

vii. Faculty development/training through distance learning may also be explored as it has several advantages. The approach provides a valuable alternative to those faculty members who cannot afford to attend regular classes due to paucity of time or difficulty in traveling or leaving place of work. It also allows one to learn in his/her own time and pace. Also the course fee/funding requirement for such courses is much lesser as compared to those of the regular courses. With the availability of large number of courses and variety of specializations

available through this approach, the distance learning has a potential of playing an important role in TEQIP programme.

viii. More intensive programmes should be organized during semester breaks to enable participation of maximum number of faculty members.

ix. Development/training centers at leading institutions such as IISc/IITs should be approached to conduct need-based specific programmes.

x. New recruits should be assigned academic duties only after their orientation/induction training programmes.

xi. Motivate faculty members to undergo training programmes; attending the same should be made a pre-requisite for their promotion/career advancement scheme.

xii. One important parameter that was not considered in this assessment study is the post-TEQIP outcome of faculty members in terms of quality of research paper publications. In phase II, stress may be given on the publications by faculty members; both in terms of quality as well as quantity and thus to boost research output of the faculty members. In phase I, there was no proper monitoring of quality of Conferences and Journals. Institutes should start a practice of rewarding a faculty member who publishes papers in reputed international journals. This will act as a motivation for the faculty members to produce good quality research output. While sponsoring a faculty member to attend a Conference, its quality should be assessed by the detailed reviews received for the accepted paper, the acceptance ratio of papers, the status of the various Chairs and Members of the Conference Committees, and publisher of the Conference Proceedings etc.

xiii. Temporary faculty members are not sent for training. It is desirable that all institutes initiate urgent steps to recruit regular faculty members to fill all the vacancies.

xiv. The practice of appointing research assistants to carry out doctoral work at the institute on payment of remuneration from TEQIP funds may be considered.

xv. Under TEQIP phase-II, it is suggested that faculty members be encouraged and helped to have more interaction with universities/research laboratories/industries abroad. To facilitate the same, the formalities for obtaining No Objection Certificate (NOC) from Government of India to undergo training in foreign countries should be simplified. The requests for attending training programmes conducted in foreign Universities may be processed faster by simplifying the administrative procedures involved. The Department of Science and Technology, Government of India, has a similar programme called BOYSCAST for young researchers.

xvi. Identifying resource persons for various kinds of training is a difficult task. The NPIU can compile a list of resource persons and their expertise to be made available to various institutions.

xvii.   The faculty members may be encouraged to get associated with national as well as international professional societies to broaden their horizon in the area of their work. Provision can be made to reimburse their full/partial Membership fees.

xviii.   In this study, the assessors found that, in general, the faculty members were happy with the faculty development programme and appreciated the assistance/support given by TEQIP in improving the academic excellence of their institutions. It is necessary that this activity needs to be nurtured further, maintained and formalized in the TEQIP phase-II period as well. Funds allotted to faculty training may be substantially increased by the World Bank in the second phase so that more faculty development programmes could be organized; if need be outside the country. The above initiatives are expected to enable the institutions to enhance and scale up their training activities and earn goodwill and respect of technical professionals in the country.

8.2.2. Recommendations for Effective Training:

i.   An important step in any faculty development/training programme is to carry out proper TNA. The assessors have pointed out that at number of institutions; the TNA was carried out on an ad-hoc basis instead of following any systematic or scientific approach. To ensure that this crucial activity is carried out properly, it is necessary that clear guidelines and procedures for carrying out TNA are required to be formulated and then followed religiously at the participating institutions. Every institution should prepare/formalize the process of preparing annual training plan. It should have goals for each department and for the institute as a whole. It should identify areas of activities such as PG programmes, research activities etc. It should also identify institutions that have competence in the new areas and should establish links with these institutes.

ii.   The institutions should conduct a large number of in-house faculty/staff development and training programmes. It will be a good idea to formalize these activities by establishing a Faculty/Staff Development Center or Center for Continuing Education Programme on the campus so that all kinds of training initiatives can be taken up in a planned and focused manner. The center can coordinate various programmes with the concerned departments, and can provide necessary assistance and infrastructure support to faculty members for organizing various programmes. The center can also be involved for the development of TNA of the institute as a whole so that a calendar of activities can be prepared in an integrated manner. The center can help in identifying new and upcoming research areas and details of expertise available in other institutes/industry to maintain a database of resource persons. The center can also maintain a database of the various training programmes offered in specialized areas within the country as well as abroad. The activities of the Staff Development Center may be planned on similar lines as those of the Centers for Continuing Education Programme existing at reputed institutes such as the IITs and IISc. The details of faculty development programmes can be displayed at their websites.

iii.   Duration of training programmes is an important aspect to consider. In general short duration programmes (<1 week) are preferred at institutes having shortage of faculty members. Though the AICTE stipulates a Faculty – Student ratio of 1:15, in reality, many colleges maintain a ratio around 1:20. This results in heavy teaching load and inadequate time for other academic activities such as faculty training, R & D and Consultancy etc. The net result is

that departments are unable to depute faculty members for long duration training programmes. On the other hand, faculty members are also not interested in going for training programmes exceeding 2 – 3 days as they have to make alternate arrangements for their classes or take extra classes on their return from training. In effect, this has resulted into in a general preference of faculty members for short-term programmes. However, such programmes lead to training inadequacy due to their short duration. This provides a motivation for conduct of long duration programmes. It has been suggested that training programmes should be of longer duration to ensure depth of knowledge transfer and it is observed that faculty members who went for long term attachment training expressed great satisfaction at the benefits. In view of these pros and cons, the duration of the training programmes to be conducted/participated by the faculty members should have a judicious mix of both. Although the long term attachment training (above one month) is highly useful to faculty members as well as to students, usually it is not encouraged by the college managements as they have to recruit temporary faculty members to handle the classes. The best way to solve the problem will be for the TEQIP colleges to have a few additional faculty members in each department (say a faculty – student ratio of 1:12) so that at any given point of time, about 10% of the faculty members can be away on training/research visits, as in the case of IITs.

iv. To improve R&D and consultancy culture, the TEQIP colleges should introduce some form of sabbatical Leave as it exists in IITs and IISc. The duration of the sabbatical leave could be six months, if one year is considered too long. This assured paid holiday can be utilized by faculty members to update their research capabilities at an Institute of their choice.

v. The institutions should identify some research areas and take up intensive and cooperative training of some faculty members in those areas in reputed institutions.

vi. It is desirable to go in for mentoring of younger faculty members by senior faculty members through mentoring/advise on selection of research topics, identification of resources, suggestions on the type of training and places for training etc.

vii. Another important step that would help in achieving the goals of TEQIP more effectively is by sharing knowledge through seminars, workshops, discussions, news groups etc. Faculty members who attend a training programme/conference/workshop should on their return disseminate the knowledge gained by presenting a seminar to other faculty members/students. Faculty members should be encouraged to attend training programmes outside their institute so that they can interact with faculty members of other institutes and colleges and observe their best teaching practices.

viii. The needs of women teachers should be kept in mind while finalizing training programmes since they constitute a significant percentage, particularly in departments such as Computer Science and Engineering, Information Science and Engineering, and Electronics and Communication Engineering etc.

Apart from these, some schemes operated by the AICTE under its Faculty Development programme may also be made part of the FDP of the TEQIP. The FDP of the AICTE operated by the FD Bureau is geared to ensure quality, relevance, excellence and equity in Technical Education. The objectives envisaged are to support programmes aimed at promoting quality of teachers; to promote programmes that facilitate career and faculty development; to recognize and support meritorious teachers; to provide opportunities for upgradation of knowledge and skills of teachers of technical

education and working professionals; to encourage research and development. Following schemes operated by the FD Bureau of the AICTE may also be considered in the TEQIP scheme:

i. **Travel Grant:** enables meritorious teachers to attend international level Conferences/Seminars/Symposia etc. to present their papers. Teachers from AICTE approved Technical Institutions /University departments are eligible for this grant.

ii. **Career Award for Young Teachers:** identifies young talented teachers for promoting their professional growth by enabling them to devote maximum time to research with minimum teaching responsibility.

iii. **Emeritus Professorship:** utilizes services of highly qualified and experienced superannuated Professors of Technical Institutions / Universities in stimulating and achieving excellence in Technical Education.

iv. **Early Faculty Induction Programme:** aims at attracting bright and young students to AICTE approved institutions to take up teaching as their career.

v. **AICTE-INAE Distinguished Visiting Professorship:** AICTE and Indian National Academy of Engineering (INAE) have jointly initiated this scheme. Under this scheme, highly experienced technical professionals from the industry visit Technical Institutions for short durations to give state-of-the-art technical lectures for the benefit of students and faculty members. They also help in curriculum design and in formulation and guidance of projects for students.

vi. **National Doctoral Fellowship:** To attract highly qualified and motivated candidates to pursue doctoral degree and offer themselves for teaching position in the Technical Education system. To provide research support to bright and young candidates for pursuing exciting and innovative research in the field of Technical Education.

The above initiatives are expected to enable the institutions to enhance and scale up their training activities and earn goodwill and respect of technical professionals in the country.

Acknowledgement

Appendix A. List of Assessors and Institutions Assessed

	Assessor	Institutions Assessed
1.	Prof AK Ghose	1. College of Engineering-Andhra University, Vishakhapatanam, AP 2. College of Engg - Osmania University, Hyderabad, AP 3. Srinidhi Institute of Science & Technology, Hyderabad, AP
2.	Prof AK Sinha	4. Institute of Engg and Management, Kolkata, West Bengal 5. Netaji Subhash Engg College, Kolkata, West Bengal
3.	Prof BB Bhattacharya	6. Bengal Science and Engg University, Howrah, West Bengal 7. NIT Surathkal, Karnataka 8. College of Engg, Chengannur, Kerala 9. Sri Chitra Tirunal College of Engg, Thiruvananthpuram, Kerala 10. Shri Sant Gajanan Maharaj College of Engg, Shegaon, Maharashtra
4.	Prof BS Sonde	11. NIT, Surat, Gujarat 12. DD University Institute of Technology, Nadiad, Gujarat 13. LD College of Engg, Ahmedabad, Gujarat
5.	Prof DK Subramanian	14. Dehradun Institute of Technology, Dehradun, Uttarakhand 15. Birla Institute of Technology, Mesra, Ranchi, Jharkhand 16. College of Technology-GBPUAT, Pantnagar, Uttarakhand 17. Jabalpur College of Engg, Jabalpur, Madhya Pradesh
6.	Dr KA Bhaskaran	18. MS Ramaiah Institute of Technology, Bangalore, Karnataka 19. National Institute of Engg, Mysore, Karnataka 20. Siddganga Institute of Technology, Tumkur, Karnataka 21. NIT, Bhopal, Madhya Pradesh 22. University Institute of Technology-RGPV, Bhopal, Madhya Pradesh
7.	Prof LS Srinath	23. College of Engg, Pune, Maharashtra 24. DKTE Society's Textile and Engg Institute, Kolhapur, Maharashtra
8.	Dr NR Shetty	25. Govt College of Engg, Coimbtore 26. College of Engg-Anna University, Guindy, Chennai 27. Thanthai Periyar Govt Institute of Technology, Vellore, Chennai 28. DCR University of Science & Technology, Murthal, Sonipat, Haryana
9.	Prof Rajnish Prakash	29. NIT Hamirpur, Himachal Pradesh 30. Govt Polytechnic College, Sundernagar, Himachal Pradesh 31. NIT Rourkela, Orissa 32. YMCA Institute of Engineering, Faridabad, Haryana
10.	Prof SP Kallurkar	33. MMCET Gorakhpur 34. HBTI Kanpur 35. IET Lucknow

Appendix B. Guidelines for Assessment of Faculty Development/Training and Options to Scale-up for Future

I Background

The review reports of faculty development activities from beginning of TEQIP have indicated a lack of planning in the preparation of the training schedules and concentration on the activities, which could be described as limited exposure to good academic practices, and some limited interaction with peers. Further, there has been a shortcoming in faculty development compared to perceived needs and expectations. Therefore, it is felt desirable to describe, analyze, and assess the faculty development activities taken place so far. In particular, there is a need to identify the reasons for shortcoming, which have contributed to the lack of planning and implementation, and to deficiencies in meeting identified training needs.

1.   Objective and Need of the Study

To assess the gains in faculty development/training during TEQIP project, to identify the reasons for deficiencies noticed in meeting the desired objectives for faculty development, to identify best practices for faculty development/training in the project, and to recommend actions for scaling-up faculty development/ training and making the process more effective in future.

2.   Elements of the Study:

The study will be conducted in 35 representative Programme institutions including 5 centrally funded institutions, covering the following four elements.

Element I: To describe, analyze, and assess the faculty development/training carried out under TEQIP. This will rely upon the available information and also draw upon interviews with faculty, HoDs and senior administrators, and discussion with students and other stakeholders (industry, employers). This element covers:

- Use of Training needs assessment
- Method for identification of training needs
- Classification of Training in the training plans
- Classification of actually implemented training
- Assessment of difference between Needs assessment versus planned training
- Assessment of difference between planned versus implemented training

This first element describes the organization of faculty development activities at the institutional, network, and State level:

- Who coordinates training and provides assistance in finding relevant programmes (Is there a formally responsible staff/faculty member for faculty development? Is faculty aware of this person; is there assistance to elaborate a training programme?)
- Did the networked institutions facilitate faculty development activities?

Further, this element shall describe the follow-up that took place in institutions after the training, this section would briefly analyze:

- The mechanism for evaluating effectiveness of the training received,
- The impact on the teacher's capability in teaching quality or enhancement in subject knowledge,

- Dissemination of the training gains benefiting other faculty members who did not undergo training from the teachers received training, and
- Whether there was a visible improvement in academic governance after senior faculty and administrators underwent management training.

Element II: To identify reasons for deficiencies noticed in meeting the objectives. This part shall systematically describe the obstacles faced in either planning or implementation of faculty development at the personal, departmental, institutional, state and central level. This part would involve detailed discussion with Director/Principal and senior faculty involved in planning the training schedule and laying down the objectives to be met. There should also be detailed discussion with a number of faculty to get their views on the possible reasons for the deficiencies in meeting the desired objectives. Further, it should be combined with the information and analysis from the first element. This section should at least discuss the following obstacles for faculty development activities:

- Relevance
- Quality
- Location
- Timing
- Sufficient time to plan attendance
- Lack of information regarding offerings
- Admission restricted / insufficient seats
- Lack of training offers in industry
- Too costly
- Not enough time (teaching load/family obligations)
- Central/State/Institutional norms encourage/discourage faculty development
- Not an institutional priority (and why not? afraid of higher turn-over of faculty)
- Not a personal interest/priority:
  o No financial incentives for faculty development
  o No perceived rewards (institutions or system fail to recognize value of faculty development)
  o Faculty development does not improve teaching or technical knowledge
  o No institutional facilitation of faculty development

Element III: To identify good and effective practices at the institution & State level. This element could address how institutional and state policies and structures have overcome the obstacles identified in the second part. Further, this part should also give identify the worst cases of what not to do. The section should contain boxes that describe concrete cases from institutions with data to sustain the classification as a best or worst case. The cases should be selected as to cover the major obstacles identified and best overall performers. This section should -

- Identify institutions with strong faculty development initiatives
- Identify States with strong faculty development initiatives
- Analyze and describe how the best institutions overcame the above obstacles, and how the other institutions failed to do so.
- Discussion whether and how the good and effective cases can be replicated.

The identification of best cases should be substantiated. To add value, this section could also identify practices that have shown to have a negative impact on faculty development.

Element IV: To recommend based upon the analysis, obstacles and best and worst practices what can be done to scale-up of faculty development and make it more effective. This will include recommendations at the institution, State and Central level. This section should draw upon analysis and findings of the previous three sections.

3.   Information Sources

I. Available data from TEQIP project

- Concise institutional Proposal (CIP)
- List of faculty members: 2004 and onwards (yearwise)
- Copy of Training Need Assessment conducted by the institution: 2004 and onwards (yearwise)
- Copy of Annual Staff Development Plan: 2004 and onwards (yearwise)
- Details of faculty training actually held: 2004 and onwards (yearwise)
- List of teachers who underwent no faculty training since 2004
- List of fresh teachers (two years or less of joining the institution)
- Tally Sheets (summary of responses of students and faculty to the questionnaires during performance audits): Third round of performance audit (Sept 2007) and onwards
- Output and Outcome indicators: 2004 and onwards (yearwise)
- Expenditure on training: 2004 and onwards (yearwise)

II. Conduct focused group discussion with relevant stakeholders

- Faculty
- Heads of Departments
- TEQIP Coordinator
- Conveners who have arranged in-house training by in-house experts
- Director/Principal
- One/Two member/s of Board of Governors of the institution

III. A sample survey of students.

4.   Conduct of the assessment: Assessment will be through visits by the assessors appointed by NPIU at sample institutions (nos 35).

5.   Time Frame: The study aims to start in September 2008 and ends in November 2008.

II General Considerations Pertaining to the Study

- The assessment covers all faculty training/development activities carried out by the institutions during TEQIP period: Since 2004 and onwards.

- The assessment covers all faculty training/development activities of any duration.

- The assessment covers all faculty training/development activities supported either from TEQIP funds or from other funds.

- Following types of training/development activities are covered under assessment.
    - I)   Short Term Training/Development (upto 30 days):
        - Conferences/Workshops (national and international)
        - Attachment to institution/organization/industry (India and abroad) for upgrading professional knowledge/research competence
        - Study tours/Exposure visits (India and abroad)
        - Management development programmes

II) Long Term Training/Development (more than 30 days):
- Attachment to institution/organization/industry (India and abroad) for upgrading professional knowledge/research competence in emerging and frontier areas
- Continuing education programmes for enhancement of knowledge/skills
- Qualification upgradation programmes.

III Guidelines for the Assessor

1) The assessment is being conducted through the assessors (auditors) appointed by NPIU at sample institutions only.

2) Each assessor will conduct the assessment at the institutions assigned to him and complete the same at each institution in 3-4 days.

3) Assessors will be paid an honorarium as per the norms circulated by NPIU earlier. In addition to the honorarium, the expenditure on travel, lodging, boarding and conveyance made by the assessor will be reimbursed by NPIU as per the existing norms.

4) One of the assessors will consolidate, analyze and prepare of a final report of the study along with key conclusions and recommendations based upon the institutional reports. For the task he will be paid an honorarium as per the norms circulated by NPIU earlier.

5) Assessors are required to prepare report of each assessment and forward (soft copy) to NPIU along with a reimbursement claim for the expenditure made by him supported with original bills.

6) Assessor and Coordinator (Contact Person) are expected to communicate each other to finalize suitable dates for the visit/s to be undertaken for the assessment.

7) Lodging, boarding and local conveyance will be arranged by the institution as per the assessor's travel plans.

8) Assessor will have focused group discussion with the faculty and students in following separate groups.

Group I) Teachers who have undergone some kind of training and/or faculty development programme

Group II) Teachers who didn't undergo any training or development programme

Group III) Fresh teachers (two or less years of joining)

Group IV) Heads of Departments

Group V) Under graduate students

Group VI) Post graduate and PhD students

Group VII) TEQIP Coordinator at the institution

Group VIII) Conveners who have arranged in-house training by in-house experts

Group IX) Director/Principal of the institution

Group X) Member/s of Board of Governors of the institution

9) Sampling of Stakeholders

The following is a suggestive sample size for conducting group discussions with various stakeholders. Assessor may modify the sample size as per the requirement and situation at the institution.

i)	Teachers who underwent some kind of training/ development programmes	:	30%-40% of such teachers (minimum nos 25 or all if number less than 25).
ii)	Teachers who didn't undergo any training/ development programme	:	30%-40% of such teachers (minimum nos 25 or all if number less than 25).
iii)	Fresh teachers (joined the institution in last two years)	:	30%-40% of such teachers (minimum nos 25 or all if number less than 25).
iv)	HODs	:	60%-70% of total HODs.
v)	Under Graduate students (from all disciplines)	:	Maximum 100 (five students from each class roll).
vi)	Post Graduate and PhD students (from all disciplines)	:	Maximum 75 (five students from each class roll) and all PhD students.

During discussion the assessor will distribute a response sheet to the stakeholders at i), ii), iii), iv), v) and vi) above. They are required to furnish and submit the same to the assessor. The assessor may select some of the teachers present in the focused group discussion, for more detailed discussion later.

10) Assessor will prepare a report of his assessment of each institution within seven days, and forward to NPIU. A broad outline of the report is indicated in Chapter VI.

11) While covering successful & effective practices/initiatives and difficulties pertaining to faculty training at the institution in the report, the assessor may include his impressions pertaining to these aspects based on his earlier visits to other institutions.

IV Guidelines for SPFU

1. The Coordinator (Contact Person) at SPFU will coordinate with the assessor and the institutions covered (communicated separately) in the assessment from the State. Coordinator (Contact Person) at SPFU is expected to discuss the dates suitable to both the assessor and the institution before finalization of schedules of the visits.

2. The arrangement of lodging, boarding and local conveyance will be made by the institution as per the assessor's travel plans. Coordinator (Contact Person) at SPFU will ensure the assessor regarding appropriate arrangements for lodging, boarding and local conveyance.

3. The Coordinator (Contact Person) at SPFU should ensure: i) all desirable support is extended to the assessor at the institution, ii) all relevant data* made available to the assessor by the institution, and iii) smooth conduct of entire assessment including facilitation in holding group discussions with relevant stakeholders** at the institution.

4. One officer from SPFU is expected to accompany the assessor during the assessment at each institution.

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*Relevant Data:

I) Concise institutional Proposal (CIP)
II) List of faculty members: 2004 and onwards (yearwise)

III) Copy of Training Need Assessment conducted by the institution: 2004 and onwards (yearwise)

IV) Copy of Annual Staff Development Plan: 2004 and onwards (yearwise)

V) Details of faculty training actually held: 2004 and onwards (yearwise)

VI) List of teachers who didn't undergo any training since 2004

VII) List of fresh teachers (two or less years of joining the institution)

VI) Tally Sheets (summary of responses of students and faculty to the questionnaires during performance audits): Third round of performance audit (Sept 2007) and onwards

VII) Output and Outcome indicators: 2004 and onwards (yearwise)

VIII) Expenditure on training: 2004 and onwards (yearwise)

**Relevant Stakeholders:

I)   Teachers who have undergone some kind of training and/or faculty development programme

II)   Teachers who have not undergone any training or faculty development programme

III) Fresh teachers (two or less years of joining)

IV)   Heads of Departments

V)   Under graduate students

VI)   Post graduate and PhD students

VII) TEQIP Coordinator at the institution'

VIII)   Conveners who have arranged in-house training by in-house experts

IX)   Director/Principal

X)   Member/s of Board of Governors of the institution

V Guidelines for the Institution

1   The arrangement of lodging, boarding and local conveyance will be made by the institution as per the assessor's travel plans. The Coordinator (Contact Person) at SPFU will inform the assessor's travel plans to the institution.

2. Director/Principal of the institution should ensure entire facilitation and smooth conduct of the assessment in all respects.

3. Director/Principal should ensure all relevant data made available to the assessor. Following data are required to be kept ready and handed over to the assessor while he visits the institution.

I)   Concise institutional Proposal (CIP)
II)   List of faculty members: 2004 and onwards (yearwise)

III) Copy of Training Need Assessment conducted by the institution: 2004 and onwards (if TNA done yearly)

IV) Copy of Annual Staff Development Plan: 2004 and onwards (yearwise)

V)   Details of faculty training actually held*: 2004 and onwards (yearwise)

VI) List of teachers who didn't undergo any training since 2004

VII) List of fresh teachers (two or less years joining the institution)

VI) Tally Sheets (summary of responses of students and faculty to the questionnaires during performance audits): Third round of performance audit (Sept 2007) and onwards

VII) Output and Outcome indicators: 2004 and onwards (yearwise)

VIII) Expenditure on training: 2004 and onwards (yearwise)

3. Director/Principal will ensure presence (in desired number as suggested at 4.) of faculty and students during visit by the assessor. The assessor will interact with the faculty and students in following separate groups.

I)   Teachers who underwent some kind of training/faculty development programme

II)   Teachers who didn't undergo training/faculty development programme

III) Fresh teachers (two or less years joining the institution)

IV) Heads of the Departments from all disciplines

V)   Under graduate students across institution

VI) Post-graduate and PhD students

VII) Conveners who have arranged in-house training by in-house experts

VIII) TEQIP Coordinator at the institution

IX) Director/Principal

X) One/Two member/s of Board of Governors of the institution

4. Focused Group Discussion with Stakeholders: The following is a suggestive sample size for conducting group discussions with various stakeholders. Assessor may modify the sample size as per the requirement and situation at the institution.

i)	Teachers who underwent some kind of training/ development programmes	:	30%-40% of such teachers (minimum nos 25 or all if number less than 25).
ii)	Teachers who didn't undergo any training/ development programme	:	30%-40% of such teachers (minimum nos 25 or all if number less than 25).
iii)	Fresh teachers (joined the institution in last two years)	:	30%-40% of such teachers (minimum nos 25 or all if number less than 25).
iv)	HODs	:	60%-70% of total HODs.
v)	Under Graduate students (from all disciplines)	:	Maximum 100 (five students from each class roll).
vi)	Post Graduate and PhD students (from all disciplines)	:	Maximum 75 (five students from each class roll) and all PhD students.

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*Details of faculty training actually held are to be reported yearwise in the proforma given on the following page.

Proforma for Faculty Training/Development Carried Out

The institution should furnish this report categorywise* and yearwise for 2004-05, 2005-06, 2006-07 and 2007-08 for the assessment.

(All multiple trainings attended by the a faculty member should be furnished in the proforma in simultaneous rows one after another)

	Name of faculty member	Department	Title of training	Date & year of training	Duration in days	Expenditure Rs Million
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

*Group the training data in following broad & sub categories:

I)   Short Term Training/Development (upto 30 days):
   - Conferences/Workshops (national and international)
   - Attachment to institution/organization/industry (India and abroad) for upgrading professional knowledge/research competence
   - Study tours/Exposure visits (India and abroad)
   - Management development programmes
II)   Long Term Training/Development (more than 30 days):
   - Attachment to institution/organization/industry (India and abroad) for upgrading professional knowledge/research competence in emerging and frontier areas
   - Continuing education programmes for enhancement of knowledge/skills
   - Qualification upgradation programmes.

Response Sheet I: Faculty Who Underwent Some Training/Development

Name, Designation and Department of the Faculty:

1) Training/Development Programmes* you attended:

	Title of the Training	Date and Year	Duration in days	Satisfaction with training effectiveness (on a 10 point scale: 1 is lowest and 10 is highest)	Utilization** of gains from training
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

*Coverage of faculty training/development:

I) Short Term (upto 30 days)
- Conferences/Workshops (national and international)
- Attachment to institution/organization/industry (India and abroad) for upgrading professional knowledge/research competence
- Study tours/Exposure visits (India and abroad)
- Management development programmes

II) Long Term (more than 30 days):
- Attachment to institution/ organization/industry (India and abroad) for upgrading professional knowledge/research competence
- Continuing education programmes for enhancement of knowledge/skills
- Qualification upgradation programmes.

**Identify the area/s in which gains from training were utilized or will be utilized in future:

- Pedagogy (teaching - learning processes) • Subject Competence • Lab Development • Research Competence
- Management Skills • Personality Development • Consultancy • Other (please specify)
………………………………………………………………………………………………..

2) If a faculty member is desirous to undergo some training/development what opportunities are available in your department.

3) If a faculty member is desirous to undergo some training/development what procedures are required to be followed in your department.

4) After attending a training/development programme, do you (put a tick mark on the relevant one):

   - ➢ Write a report on the contents, quality and gains acquired
   - ➢ Give a seminar to the peers
   - ➢ Replicate the training programme for peers

5) Rate the degree of enhancement in your following capabilities after undergoing training on a 10 point scale (1 is lowest and 10 is highest):

   - ➢ Pedagogy (teaching - learning processes):
   - ➢ Subject Competence:
   - ➢ Lab Development:
   - ➢ Research Competence:
   - ➢ Management Skills:
   - ➢ Continuing Education:
   - ➢ Qualification Upgradation:
   - ➢ Consultancy:
   - ➢ Other (please specify):

6) Have you ever participated in the training need assessment (TNA) or similar exercise in your department?: Yes / No

7) How (method) training needs assessment (TNA) or similar exercise is carried out in your department?

8) Have you ever identified your training needs and expressed in the TNA exercise?: Yes / No

9) Have you received training as per training needs identified by you: Yes / No

   If no, what were the reasons contributed to not undergoing training as per plan.

10) Your suggestions for scaling up faculty training.

11) Your suggestions for making faculty training more effective.

Response Sheet II: Faculty who did not undergo any training/development

Name, Designation and Department of the Faculty:

1) Do you feel that you require an enhancement in your professional knowledge/competence?: Yes / No

2) Could some training help you in enhancing your professional knowledge/competence?: Yes / No

   If yes, in which area/s you wish to undergo (put a tick mark on your preference/s).

   ➢ Pedagogy (teaching - learning processes):
   ➢ Subject Competence:
   ➢ Lab Development:
   ➢ Research Competence:
   ➢ Management Skills:
   ➢ Consultancy:
   ➢ Continuing Education:
   ➢ Qualification Upgradation:
   ➢ Others (please specify):

3) State the reasons that contributed to you not undergoing training.

4) If a faculty member is desirous to undergo some training/development what opportunities are available in your department.

5) If a faculty member is desirous to undergo some training/development what procedures are required to be followed in your department.

6) State the difficulties you anticipate in undergoing training and/or development.

7) Your suggestions for involving all teachers in training and making such training beneficial to faculty and also effective for the institution.

8) Your suggestions for scaling up faculty training/development, if any.

Response Sheet III: Fresh Faculty (two or less years of joining)

Name, Designation and Department of the Faculty:

Date of Joining:

1) Did you undergo an induction programme?: Yes / No

   If no, do you feel it was required?: Yes / No

2) Did you undergo pedagogy training?: Yes / No

   If no, do you feel it was required?: Yes / No

3) Do you feel that you need enhancement in any of the following areas (put a tick mark on your preference/s)?:

   ➢ Pedagogy (teaching - learning processes):
   ➢ Subject Competence:
   ➢ Lab Development:
   ➢ Research Competence:
   ➢ Management Skills:
   ➢ Consultancy:
   ➢ Continuing Education:
   ➢ Qualification Upgradation:
   ➢ Other (please specify):

5) If a faculty member is desirous to undergo some training/development what opportunities are available in your department?

6) If a faculty member is desirous to undergo some training/development what procedures are required to be followed in your department?

6) State the difficulties you anticipate, if any in undergoing training and/or development.

7) Your suggestions for involving all teachers in training and making such training beneficial to faculty and also effective for the institution.

Response Sheet IV: Heads of the Departments

Name and Department of the HoD:

1) What are the common difficulties you faced in identifying training needs of your faculty?

2a) How (method) the training needs of faculty are identified in your department?

2b) Your suggestions for making training needs assessment (TNA) process more scientific and beneficial.

3) If one of your faculty member is desirous to undergo some training/development what opportunities are available in the institute?

4) What are the common difficulties you anticipate in making your faculty undergo training?

5) If a faculty member is desirous to undergo some training/development what procedure he/she is required to follow?

6) To understand the effectiveness of the training attended by faculty members who of the following method followed in your department (put a tick mark on the relevant ones)?

   ➢ Written report:
   ➢ Seminar for peers:
   ➢ Replication of the training for peers:
   ➢ None:

7) Rate the degree of enhancement you perceive in following capabilities of those faculty who underwent relevant training on a 10 point scale (1 is lowest and 10 is highest). (Since different faculty members may be graded differently as per your perception, give an overall average. However, also identify the best and worst case ratings separately.)

   ➢ Pedagogy (teaching - learning processes):
   ➢ Subject Competence:
   ➢ Lab Development:
   ➢ Research Competence:
   ➢ Management Skills:
   ➢ Consultancy:
   ➢ Other (please specify):

8) What kinds of grievances from faculty (pertaining to training) you hear most often?

9) Your suggestions for scaling up faculty training.

10) Your suggestions for making faculty training more effective.

Response Sheet V: Students

Name:
Programme Pursuing (put a tick mark):   UG / PG / PhD
Semester and Discipline:

1a) Rate performance level of your teachers who have taught you so far in following items on a 10 point scale (1 is lowest and 10 is highest). (You may have had many teachers, some excellent, others good, and some not so good, give an overall average grading.)
- ➢ Subject knowledge:
- ➢ Pedagogy (teaching learning) skills:
- ➢ Communication skills:
- ➢ Evaluation (of students performance) skills:
- ➢ Research competence:

1b) Of all the teachers who have taught you, mention the numbers of teachers in following categories.

- ➢ Out standing/Excellent:
- ➢ Very Good:
- ➢ Good:
- ➢ Satisfactory:
- ➢ Poor:

2) Do you feel that any of the following capabilities of your teachers need to be enhanced (put a tick mark on the relevant ones).

- ➢ Subject knowledge:
- ➢ Pedagogy (teaching learning) skills:
- ➢ Communication skills:
- ➢ Evaluation (of students performance) skills:
- ➢ Research competence:

3) Do you give your feedback on performance of your teachers?: Yes / No
If yes, state frequency of feedback (put a tick mark on the relevant one):
Once a year / Twice a year / Once a semester / Twice a semester

4) Whether (to your knowledge) your institution makes any use of students' feedback?: Yes / No
If yes, please write about how students' feedback are utilized by the institution:

6) Some of your teachers may have undergone training. Please rate the degree of improvement in performance after their return from the training, on a 10-point scale (1 is lowest and 10 is highest). (Your rating may differ for teacher to teacher, give an overall average rating and also identify rating for best and worst case):

7) Your suggestion regarding improvement in faculty training: planning, procedures and implementation, if any.

VI Suggestive Contents of Assessment Report

- Executive Summary (2-3 pages) of faculty training at the institution.

Section A: Analysis of TNA (whether done or not, if done was it proper and comprehensive, whether used for preparing annual training plans).

Section B: Status of training carried out in various categories till August 2008 (by each financial year and by categories*). The Assessor will comment on: a) the coverage of faculty that have undergone various training programmes and on the trend, and b) the training planned and actually held.

Section C: Perceived gains (by categories* in percentage terms), faculty satisfaction with opportunity for training/development, quality of training received, utilization of gains.

Section D: Successful and effective practices and initiatives.

Section E: Identifying deficiencies and assessment of reasons contributed for the deficiencies.

Section F: Recommendations for scaling up and making faculty training/development more effective.

Annexure: • List of various focus discussion group participants (faculty that underwent training, faculty that did not underwent training, fresh faculty (2 years of joining), Heads of Departments, TEQIP Coordinator, Conveners who have arranged in-house training by in-house experts, UG, PG and PhD students, and Director/Principal)

• Summary of each focused group discussions (written by assessor based on responses of stakeholders in group discussions)

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*Categories of training/development:

I) Short Term Training (upto 30 days):
- Conferences/Workshops (national and international)
- Attachment to institution/organization/industry (India and abroad) for upgrading professional knowledge/research competence
- Study tours/Exposure visits (India and abroad)
- Management development programmes
II) Long Term Training (more than 30 days):
- Attachment to institution/organization/industry (India and abroad) for upgrading professional knowledge/research competence
- Continuing education programpmes for enhancement of knowledge/competence/skills
- Qualification upgradation programmes.