

NATIONAL REPORT ON TRACER STUDY OF ALUMNI OF TEQPII INSTITUTIONS

Prepared by

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CONTENTS

Executive Summary

1: TEQIP Overview

Preamble, TEQIPI, TEQIPII,

2: Tracer Study of Alumni

Objectives, Scope, Methodology, Expected outcomes

3: Questionnaire Development and its Use

Preparative steps, Questionnaire, Conducting the study

4: Tracer Study Findings and Inferences

Preliminary steps, General information, Specific information

5: Recommendations

General, Specific

Annexure A: The *Questionnaire*

Annexure B: Tracer Study 2016-Data Analysis

Executive Summary

The Report describes the *Tracer Study of Alumni of TEQIPII Institutions at the National Level* conducted in September 2016 by National Project Implementation Unit (NPIU), MHRD-Government of India in the closing stages of World Bank assisted technical education project TEQIPII. The Study included receiving *on-line* responses from alumni of project institutions of two recent batches, i.e., 2013-14 and 2014-15 to a professionally designed *Questionnaire* (Annexure A) distributed to them seeking their evaluation of the functioning and outcomes of the TEQIPII project at their respective institutions. Of the 190 institutions in the project, 5,584 alumni from 116 institutions responded to the *Questionnaire* and their responses compiled and brought out in Dec. 2016 by NPIU in a document entitled, 'Tracer Study 2016-Data Analysis' (Annexure B). This has been the basis for the National Report presented in the following pages.

The Report is divided into five sections including the relevant data/information provided in tabular form wherever found necessary. While Section 1 gives an overview of TEQIP and brings out the importance of TEQIPII, the Tracer Study of Alumni including its objectives, scope, methodology and expected outcomes are detailed in Section 2. Development of the *Questionnaire* and conducting the Study are then taken up in Section 3. The tracer study findings and inferences are then presented in Section 4 including the general information on respondents followed by specific information provided by alumni relating to different aspects of curricular, co-curricular and placement-/employment-related activities pursued at their respective institutions. The Recommendations emerging from the Study are then outlined in Section 5 which is the concluding section of the Report. Although data/information made available for the Report is rather limited due to a large cross section of the alumni not availing of the opportunity to provide their responses to the *Questionnaire*, it is expected that the outcome of the Study is good enough to indicate the trends in functioning and achievements of TEQIPII in the country. However, **it is believed that any future surveys like this need to make more serious attempt to associate all the project institutions** and get their alumni responses on a 100% basis to be able to draw more meaningful inferences from the Study.

1. TEQIP Overview

1.1 Preamble:

It is well known that the Indian engineering education system has become large and unwieldy nowadays with over 3500 degree institutions and annual intake of about 1.5 million students. But, this expansion has not yet resulted in any significant growth of quality engineering graduates due to many limitations in the system, like:

- Acute shortages of qualified/experienced faculty in most of the institutions.
- Poor industry-academia collaboration in most cases.
- Obsolete learning infrastructure and inability to cope up with change.
- Stagnating quality and standard of research output of faculty/students.
- Difficulties in attracting good students to take up teaching as a career.

Recognizing these limitations the Government of India had launched the Technical Education Quality Improvement Programme (TEQIP) as a long-term strategy in 2002-03, to be implemented with financial and administrative support from the World Bank. The main objective of TEQIP organized in three phases was the systemic transformation of the technical education system in the country with major focus on degree level engineering education.

1.2 TEQIP I:

The first phase of TEQIP (TEQIP I) was conducted during 2003-09. This phase covered 127 institutions including 109 from 13 States and UTs and 18 Centrally Funded Institutions (CFIs). In this phase, each institution selected by competitive bidding was provided good funding and many incentives to progress at a rapid pace by implementing a set of well-defined reforms promoting academic and administrative autonomies. The bottoms-up approach empowered these institutions to improve their curriculum, teaching, assessment and expand their research and related activities. Autonomy and accountability reforms took place through the creation of Board of Governors in each case, as each participating institution took the first step towards autonomous governance and increased accountability. Further, TEQIP funds could be invested for faculty development, attending national and international conferences, procuring modern laboratory/research equipment as

necessary and expanding/improving the physical infrastructure at each participating institution. This facilitation, periodic mentoring and performance auditing and close monitoring of each institution by the State/Central Government and the World Bank have enabled TEQIPI to achieve good success. Notable results of TEQIPI in the period 2003-09 cover the improvement in placement of graduates (from 41% to 78%), increase in the number of research papers published (from 453 to 4273), increase in the number of PG's passing out (from 7,218 to 10,571) and Ph.D.'s produced (from 342 to 587). In the same period, the percentage of programmes accredited rose from about 40 to 93.

1.3 TEQIP II:

The second phase, TEQIPII was initiated in March 2010 for the period 2010-16, based on the success of TEQIPI. This phase was more ambitious as it covered 190 engineering institutions in all, including 164 from 23 States and UTs as well as 26 CFIs, competitively selected for further improvements in the quality of technical education imparted. The strategy adopted here involved further strengthening of institutional and systemic reforms to achieve the goals set. Activities under TEQIPII followed the same principles as of TEQIPI, but beefing up the implementation with rigorous /detailed monitoring and computerized procedures. Further, scaling up of capacity-building of Government officials, Governing bodies, Directors and Faculty, boosting up efforts in nurturing more post-graduate engineers to reduce faculty shortages and taking up more R&D work and collaboration with industry were also given importance under TEQIPII. Hence, the project objectives focused on two Components of project institutions, viz., 1. *Improving the quality of education* covering four Sub-Components, i.e., 1.1: Strengthening of institutions to produce high quality engineers for better employability (at 113 institutions), 1.2: Scaling-up of PG education and demand-driven R&D and Innovation (at 77 institutions), 1.2.1: Establishing Centres of Excellence for focused applicable research (at selected ~30 institutions from those under 1.2), 1.3: Training of faculty for effective teaching (pedagogical training) at all 190 institutions; and 2. *Improving the System management* covering two Sub-Components, i.e., 2.1: Capacity building to strengthen management, 2.2: Project management, monitoring and evaluation, both being at all the 190 institutions. Substantial funding and incentives were provided to the project institutions under TEQIPII also and their progress in fulfilling the objectives laid down was well facilitated. Together with periodic mentoring, performance auditing and close monitoring of each institution by the State

/Central Government and the World Bank, it has been possible to achieve good success of TEQIP II. At a recent meeting of the TEQIP II Joint Review Mission (5th in the series) held at New Delhi in Jul-Aug 2015, it was decided to conduct a feedback survey among recent alumni of project institutions to get their comments/suggestions on the functioning of TEQIP II at their respective institutions with a view to supplement the performance audits and close monitoring being done separately. For this purpose, an *on-line* survey termed as '*Tracer Study of Alumni*' was undertaken by NPIU during 2015-16. This is described in the following sections along with the outcomes/results of the study.

2. Tracer Study of Alumni

The *Tracer Study of Alumni* of TEQIP II project institutions were conducted as follows:

2.1 Objectives:

After detailed discussion at various levels, it was decided to have the following objectives for the study:

- (a) Determining the quality of engineering education as perceived by alumni based on the feedback response from them relating to their respective institutions.
- (b) Understanding the level of professional success of alumni after graduation from their respective institutions based on their feedback response.
- (c) Enabling the national-/state-level technical education planners and the project institutions to get useful feedback on strengths and weaknesses of the programmes studied by alumni.
- (d) Making use of the feedback responses received under (a)-(c) above, to take necessary steps for planning and implementing the technical education system for better quality/standard.
- (e) Formalizing the alumni' role in improving the quality and standard of technical education in the country and enhancing their relationship/interactions with the respective institutions.

2.2 Scope:

As impressions on their studentship days at their respective institutions would be fresh in alumni' minds in the first few years after their graduation, it was decided to confine the study to more recent batches only. And, looking at the need to cover alumni from all the project institutions in the country, it was decided to limit the alumni to only those who passed out in two recent years,

i.e., 2013-14 and 2014-15. With this, it was felt that the number of respondents could go to as high as 200,000 and this number would be satisfactory for the *Tracer Study of Alumni* to be able to draw national/state/institutional level inferences on TEQIP II as may be required.

2.3 Methodology:

After discussion at various forums, the following methodology was decided for conducting the *Tracer Study of Alumni*:

- (a) Decide on a reliable and accurate methodology to address the above objectives and scope of study with a view to get alumni responses quickly for being able to draw inferences.
- (b) Design an appropriate *Questionnaire(s)* for seeking *on-line* alumni response on various experiences during their study years in the respective institutions.
- (c) The *Questionnaire* to focus on academic activities of a student from admission to graduation like, curriculum, teaching-learning, labs/library, R&D work and industry exposure.
- (d) The *Questionnaire* to also include campus placement, co-/extra-curricular activities and other facilities like infrastructure, hostels, counseling/guidance and for professional growth.
- (e) The *Questionnaire* so designed after wide discussion, fine tuning and getting approval from the competent authorities to be administered to alumni of the two batches as planned.
- (f) The *Questionnaire* to be widely publicized through websites of NPIU/SPFUs/Project Institutions and other means to reach out alumni for *on-line* response before a deadline.
- (g) The *on-line* response to the *Questionnaire* to be subjected to analysis for extracting relevant information on TEQIP II performance at the institution/state/national level as required.

2.4 Expected Outcomes:

This study is expected to provide a variety of useful information on TEQIP II performance at the institutional/state/national levels as given below:

(a) Institutional level:

- The extent to which alumni are satisfied with their studies at the institution concerned.

- The extent to which alumni of the institution are successful in their professional careers.
- Contribution of the institution concerned in the success of alumni in their careers.
- SWOT analysis of the institution based on its TEQIPII performance as perceived by alumni.
- The role of alumni in stimulating their institutional efforts during assessment/accreditation.

(b) State level:

- State level classification of institutions based on the quality of their educational outcomes.
- Overall performance of the state under TEQIPII and its major achievements.
- SWOT analysis at state level based on TEQIPII performance of engineering institutions.
- Listing of remedial actions needed in the State concerned to rectify the deficiencies, if any.

(c) National level:

- National level classification of institutions based on the quality of educational outcomes.
- Overall performance at national level under TEQIPII and its major achievements.
- SWOT analysis at national level based on TEQIPII performance of engineering institutions.
- Listing of remedial actions needed at national level to rectify the deficiencies, if any.

It is expected that the Reports of this study at the institutional/state/national levels covering the above outcomes would be beneficial to the respective institutions, the states concerned and at the national level as the case may be. Besides providing valuable data/information on the *quality status* of engineering education as perceived by the alumni, these Reports can also supplement the Performance Audit and other evaluation reports of the institutions concerned.

3. Questionnaire Development and Conducting the Study

3.1 Preparative Steps:

Based on the objectives, scope, methodology and expected outcomes given in the previous section, the *Questionnaire* had to be developed to seek the relevant information *on-line* from the alumni of TEQIPII institutions. For this purpose it was decided to take into account the following major factors during the *Questionnaire* design:

- The relevant information on institutional performance to be built into the questions in the *Questionnaire* so that the *responses* truly reflect the *Alumni Satisfaction Level* in each case.
- As the *response* to include assigning a grade (4-5 levels) or marking yes/no/nil (3 levels) for a *question*, the question-wise percentage scores need to be computed to yield the result.
- This requires administering the properly designed *Questionnaire on-line* to alumni and getting their response also *on-line* for which software like 'Survey Monkey' to be of help.
- This step to be also helpful in analyzing the response received and generating result sheets giving institution-wise, state-wise or national-level percentage scores for each question.
- These result sheets to form the basis for drawing up of inferences on the question-wise *Alumni Satisfaction Level* at the institutional/state/national level as may be necessary.

3.2 Questionnaire:

Considering these factors and in consultation with technical education planners and experts in the field of technical education it was decided to seek the alumni response on their studentship at the respective institutions in the following six broad areas. It was also decided to work out a set of points/queries under each of these areas to frame suitable questions in the *Questionnaire* (given in Annexure A) for seeking alumni response on them *on-line*:

(a) General information on the alumni respondents:

- State/UT of the institution from where the alumnus had obtained the engineering degree.
- Name of the institution wherein the alumnus had studied for the engineering degree.
- Method followed by the alumnus for identifying the institution for engineering studies.
- Year of graduation of the alumnus with the B.E. degree.
- Gender of the alumnus.
- Engineering branch in which the alumnus had studied for the B.E. degree.
- Number of years taken by the alumni for graduating with the B.E. degree.
- Number of years taken by the alumnus for transition from 1st to 2nd year in the programme.

(b) Alumni opinion on institution wherein he/she studied for engineering degree:

- Evaluation scheme followed at the institution for students' academic performance.

- Methodology of teaching-learning followed at the institution in the classrooms/labs.
- Grading by the alumnus of learning experience at the institution.
- Grading by the alumnus of academic and other facilities at the institution.
- Grading by the alumnus of other experiences the institution.
- Grading by the alumnus of the usefulness of engineering studies
- Conducting bridge courses at the institution for the benefit of students.
- Conducting remedial classes at the institution for the benefit of weak students.
- Providing guidance and counseling at the institution for the benefit of students.
- Satisfaction level of the alumnus having studied at the institution.

(c) Alumni opinion on studies' related activities at the institution:

- Facilities at the institution on Industry-Institute Interaction (III).
- Recommendation of the *alumnus* to the institution on the setting up of III cell.
- Facilities for industrial training and/or internship provided by the institution.
- Availability of Internship Assistance (IA) cell at the institution.
- Recommendation of the alumnus to the institution on the setting up of IA cell.

(d) Alumni opinion on placement activities at the institution:

- Semester in which placement activities were started at the institution.
- Availability of Placement cell at the institution.
- Grading by the alumnus of the Placement cell and its facilities at the institution.
- Grading by the alumnus of the placement experience at the institution.
- Semester in the B.E. programme preferred by the alumnus for starting placement activities.

(e) Opinion of alumni on matters: of interest to alumni at the institution

- Availability of Alumni Association (AA) set up at the institution.
- Membership status of the alumnus in the AA at the institution.
- Possible contribution of the alumnus to the development of the institution.

(f) Alumni opinion on employment-related matters:

- Extra training/courses undertaken by the alumnus during or after B.E. degree course.

- Specific reasons for undertaking such training/courses by the alumnus.
- Current employment status of the alumnus.
- Method followed by the alumnus for getting the first job after getting the B.E. degree.
- Time taken by the alumnus to get the first job after getting the B.E. degree.
- Number of jobs applied for by the alumnus after getting the B.E. degree.
- Number of factors important for the alumnus in being employed.
- Type of professional training received by the alumnus from the first employer.
- Number of times the jobs changed by the alumnus since getting the B. E. degree.
- Current place of employment the alumnus.
- Length of service of the alumnus in the present place of employment.
- Type of employer for present job of the alumnus.
- Area/Department wherein the alumnus working at present.
- Relationship of the work profile of the alumnus with engineering branch of graduation.

3.3 Conducting the Study:

The *Questionnaire* prepared in this manner and given in Annexure A formed the basis for the *Tracer Study of Alumni* conducted by NPIU in Sept. 2016. This included a total of 68 questions covering the six broad areas listed above, with the questions classified into three categories, viz.,

- i. 10 Questions (14.98%) seeking graded response from alumni in 4-5 levels, e.g., Q32-37, Q41, Q49-50 and Q59;
- ii. 14 Questions (20.88%) seeking response from alumni by marking in 3 levels, e.g., Q38-40, Q42-46, Q48, Q51-53, Q60 and Q66;
- iii. 44 Questions (64.14%) seeking alumni response by identifying the applicable alternative in the list given, e.g., Q1-31, Q47, Q54-58. Q61-65, Q67 and Q68.

This type of categorization and the range of questions included in the *Questionnaire* appear to be satisfactory for fulfilling the objectives of the study. For being able to administer the *Questionnaire* to alumni and get their responses *on-line*, the e-mail IDs of alumni who had graduated in the years 2013-14 and 2014-15 were obtained from the respective TEQIP II institutions and the *Questionnaire* mailed to them to seek their responses. 'Survey Monkey' software was found useful here and also for compiling the responses received to yield the information required on the opinions sought from

alumni respondents. Additionally website announcements by NPIU, SPFUs of all the 23 States/UTs and the project institutions themselves and personal contacts wherever possible were made use of to reach out to a large cross section of alumni and obtain their feedback response. These responses have been tabulated by NPIU in a document entitled '*TEQIPII Tracer Study 2016-Data Analysis (Dec.02, 2016)*' enclosed as Annexure B to this Report, wherein the question-wise response scores both in absolute values and in percentages for all the 68 questions as responded by alumni from all over the country have been computed. These Tables provide useful data/information on the functioning of TEQIPII nationally as perceived by the alumni of project institutions and form the basis for further analysis and drawing up of inferences on the performance of TEQIPII. This is discussed in the next Section.

4. Tracer Study Findings and Inferences

4.1 Preliminary:

In all, 5584 alumni provided their responses *on-line* to the *Questionnaire* in Annexure A (which was administered by NPIU using 'Survey Monkey' software) before the prescribed closing date of **Sep. 30, 2016. Although this number is rather small in comparison to the expected number of engineering graduates passing out in each year**, it was decided to conduct the analysis of the responses received to understand the perception of the 2013-14 and 2014-15 graduates on the trends in TEQIP II functioning at their institutions. For this purpose, it was decided to extract the following data/information on the institution from the alumni responses received:

1. General information on respondents:
 - (a) Distribution of alumni respondents in States/UTs/CFIs.
 - (b) Distribution of alumni respondents at institutions.
 - (c) Engineering branches preferred by alumni.
2. Specific information provided by respondents:
 - (a) B.E. degree studies at chosen institution.
 - (b) Industry-Institute interaction.
 - (c) Placement activities.
 - (d) Alumni-related activities.
 - (e) Employment-related activities.
 - (f) Contributions to institutional progress.

These are now being discussed in detail in the following sub-sections, along with the author's Observations and Inferences in each case.

4.2 General Information on Respondents:

(A) Distribution of alumni respondents in States/UTs/CFIs: Table 1 gives a summary of the distribution of alumni respondents arranged State/UT/CFIs-wise based on their responses to Q1-Q27 in the *Questionnaire*. Also included in this Table is the distribution of State/UT/CFIs-wise TEQIP II institutions in the country in column 3 **extracted from the NPIU website** for comparison with the data given in column 4. The alumni responses received in each case are given in column 5 of the Table. The following observations are being made now from the data presented in this Table:

- (a) Responses to the *Questionnaire* have been received from alumni of 116 out of 190 (=60.15%) TEQIP II institutions only.
- (b) Of these responses received, State/UT-level TEQIP II institutions constitute 104/164 (=63.41%) and the CFIs constitute 12/26 (=46.15%).
- (c) Majority of the respondents (~50%) belong to TEQIP II institutions from only three States, viz., Karnataka (24.48%), Tamil Nadu (13.27%) and Kerala (10.95%).
- (d) *No or poor response (<1%)* received from alumni of TEQIP II institutions in nine States at S. No.2, 5-7, 12-14, 21 viz., Bihar, Haryana, HP, Jharkhand, NCT-Delhi, Odisha, Punjab, Rajasthan and UP.
- (e) Ranking of States/CFIs based on the number of respondents in each case indicates that CFIs are at 5th position below the States of Karnataka (1), Tamil Nadu (2), Kerala (3) and Maharashtra (4).
- (f) Out of the total number of respondents (=5584), 39.92% belong to the 2013-14 batch and 60.08% are from the 2014-15 batch.
- (g) But, the number of respondents from each year is too small compared to the annually expected number of graduates (~100,000), i.e., 2229 (<2.3%) in 2013-14 and 3355 (<3.5%) in 2014-15.
- (h) Breakdown of total number of respondents gender-wise, i.e., male: 4392 (=75.07%) and female: 1392 (=24.93%), corresponding closely to the students' admission pattern in recent years.

From these observations, it can be inferred that:

- Serious attention being given to TEQIP II mainly in four States, viz., Karnataka, Tamil Nadu, Kerala, Maharashtra and in CFIs.

- Very poor alumni response indicative of TEQIP II functioning as yet at a low level in the States listed under (d) above or their SPFUs/project institutions concerned being non-serious.
- Poor alumni response from many states may possibly be **due to limitations in the publicity drive of NPIU in** tracing the alumni of project institutions and reaching the *Questionnaire* to them.

Table 1: Distribution of Alumni Respondents from TEQIP II Institutions at State/UT/CFIs Level
Total Number of Respondents: 5584, Questions covered: Q1-Q27

S. No.	States/CFIs	TEQIP II Institutes No.*	Institutes having Alumni responses		Alumni Responses received		Remarks
			No.	%	No.	% of Total	
1	Andhra Pradesh	11	08	70.27	253	4.46	8 th in Responses No.
2	Bihar	02	00	00	00	00	No response
3	Chhattisgarh	04	03	75.00	83	1.43	13 th in Responses No.
4	Gujarat	07	07	100.00	315	5.66	7 th in Responses No.
5	Haryana	06	00	00	00	00	No response
6	Himachal Pradesh	01	01	100.00	34	0.61	Too few responses
7	Jharkhand	02	01	50.00	01	0.02	Too few responses
8	Karnataka	19	12	63.15	1377	24.48	1 st in Responses No.
9	Kerala	19	10	52.63	601	10.95	3 rd in Responses No.
10	Madhya Pradesh	05	03	60.00	110	1.95	12 th in Responses No.
11	Maharashtra	17	11	65.29	590	10.42	4 th in Responses No.
12	NCT-Delhi	01	00	00	00	00	No response
13	Odisha	02	02	100.00	02	0.02	Too few responses
14	Punjab	08	05	62.50	06	0.11	Too few responses
015	Rajasthan	09	04	44.44	35	0.59	Too few responses
16	Tamil Nadu	09	09	100.00	746	13.27	2 nd in Responses No.
17	Telangana	13	06	46.15	242	4.33	9 th in Responses No.
18	Tripura	01	01	100.00	76	1.24	14 th in Responses No.
19	UT-Chandigarh	03	03	100.00	173	3.10	10 th in Responses No.
20	UT-Puducherry	01	01	100.00	56	1.00	15 th in Responses No.
21	Uttar Pradesh	07	05	71.42	51	0.82	Too few responses
22	Uttarakhand	03	03	100.00	123	2.20	11 th in Responses No.
23	West BenOgal	14	09	64.29	323	5.76	6 th in Responses No.
24	CFIs	26	12	46.15	433	7.75	5 th in Responses No.
Total		190	116	60.15	5584	100.00	
		*in website			Breakdown		
Graduated in 2013-14		_____	_____		2229	39.92	No specific comment
Graduated in 2014-15		_____	_____		3355	60.08	
Male Respondents		_____	_____		4192	75.07	Satisfactory
Female Respondents		_____	_____		1392	24.93	

(B) Distribution of alumni respondents at institutions: Table 2 gives an analysis of information relating to the distribution of alumni respondents at TEQIP II institutions arranged

State/UT/CFIs-wise as expanded from Table 1. For convenience, Table 2 includes the data from only those States/UTs/CFIs which are ranked 1-15 in Table 1 based on the number of respondents in each case. While column 4 in this Table reproduces the respondent numbers State/ UT/CFIs-wise from Table 1, the institutions in each State/UT or from CFIs having more than 10% respondents in each case are only listed in column 2 and the actual percentage breakdown of the respondents in these institutions is presented in column 5. The following observations are being made now based on the data presented in Table 2:

- (a) Alumni from only 48 including State/UT (44) and CFI (4) TEQIP II institutions have responded to the *Questionnaire*, i.e., 44/104 (=42.5%) and 4/12 (=33.33%) of the total in each case.
- (b) Surprisingly the list does not include alumni of many well performing TEQIP II institutions under both State/UT and CFI categories, as no responses to the *Questionnaire* received from them.
- (c) The alumni respondents reasonably well distributed across all the State/UT/CFI institutions included in the list, providing useful information through their responses.

From these observations, it can be inferred that:

- **Wide publicity and more efforts required to reach out all TEQIP II institutions**, contact their alumni and receive their responses to the *Questionnaire*.

Table 2: Analysis of Alumni Respondents from TEQIP II Institutions at States/UTs/CFIs
Total Number of Respondents: 5584, Questions Covered: Q2-Q25

S. No.	State/CFI	Institutions having >10% respondents in each State/UT/CFI	Responses received (Total No.)	Institution-wise respondents (% of Total No.)
1.	Andhra Pradesh	1 Shri Vidyanikethan Engg. College, Chittoor 2 JNTU College of Engg., Kakinada 3 Aditya Institute of Tech. & Mgmt. , Srikakulam 4 Shri Vishnu Engg. College for Women, Bhimavaram	253	33.99 24.90 22.13 17.00
2.	Bihar	Nil	Nil	Nil
3.	Chhattisgarh	1 Govt. Engg. College, Raipur 2 Govt. Engg. College, Bilaspur	83	83.13 15.66
4.	Gujarat	1 Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar 2 Lukhdirji Engg. College, Morbi 3 Shantilal Shah Engg. College, Bhavnagar 4 Govt. Engg. College, Gandhinagar 5 Lukhdiji Engg. College, Morbi 6 Govt. Engg. College, Patan	315	24.44 17.46 16.83 16.83 12.70 11.11

5.	Haryana	Nil	Nil	Nil
6.	Himachal Pradesh	Nil	Nil	Nil
7.	Jharkhand	Nil	Nil	Nil
8.	Karnataka	1 BMS College of Engg., Bangalore 2 Dr. Ambedkar Institute of Tech., Bangalore 3 Malnad College of Engg., Hassan 4 Univ. Visvesvaraya College of Engg., Bangalore	1377	16.85 13.87 11.55 10.31
9.	Kerala	1 TKM College of Engg., Kollam 2 School of Engg., CUSAT, Kochi 3 LBS Institute of Tech. for Women, Thiruvananthapuram 4 College of Engg., Kannur	601	30.28 17.14 12.65 11.45
10.	Madhya Pradesh	1 Samrat Ashok Tech. Inst. Vidisha 2 Madhav Institute of Tech. & Science, Gwalior	110	52.73 46.36
11.	Maharashtra	1 Veermata Jijabai Tech. Institut Mumbai 2 Dr. Babasaheb Ambedkar Tech. Univ. Lonere 3 Rajarambapu Institute of Tech., Islampur 4 Walchand College of Engg., Sangli	590	29.32 25.08 18.98 16.44
12.	NCT-Delhi	Nil	Nil	Nil
13.	Odisha	Nil	Nil	Nil
14.	Punjab	Nil	Nil	Nil
15.	Rajasthan	Nil	Nil	Nil
16.	Tamil Nadu	1 PSG College of Tech., Coimbatore 2 Govt. College of Tech., Coimbatore 3 Govt. College of Engg., Salem 4 Bharathidasan Inst. of Tech. Campus, Tiruchirapalli 5 Thiagarajar College of Engg., Madurai 6 AC College of Engg., & Tech., Karaikudi	746	16.35 15.68 14.61 14.08 13.81 13.09
17.	Telangana	1 Vasavi College of Engg., Hyderabad 2 GR Inst of Engg. & Tech. Hyderabad 3 Aurora's S,T&R Acad., Hyderabad	242	50.00 31.82 15.29
18.	Tripura	1 Tripura Inst. of Tech. Narsingarh	76	100.00
19.	UT-Chandigarh	1 PEC Univ. of Tech., Chandigarh 2 Univ Inst of Engg.&Tech Chandigarh	173	54.34 44.51
20.	UT-Puducherry	1 Pondicherry Engg. Coll., Puducherry	56	100.00
21.	Uttar Pradesh	Nil	Nil	Nil
22.	Uttarakhand	1 BT Kumaon Inst. of Tech., Almora 2 GB Pant Engg.Coll., Pauri Garhwal	123	49.59 47.15
23.	West Bengal	1 Narula Inst. of Tech. Parganas 2 RCC Inst. of IT, Kolkota 3 College of Engg. &Mgmt., Kolaghat	325	30.77 29.85 21.54
24.	CFIs	1NIT, Silchar (Assam)	434	26.04

	2MNNIT, Allahabad (UP)	11.52
	3NIT, Raipur (Chhattisgarh)	11.06
	4 VNIT, Nagpur (Maharashtra)	10.37

(C) Engineering branches preferred by alumni: Table 3 is based on the alumni responses to Q28 in the *Questionnaire*, wherein their response on the ‘engineering branch of study’ chosen by them for their first engineering degree has been sought. As seen from this Table, eight branches of engineering, i.e., ME, ECE, CV, CSE, EEE, EE, IT, CH have received significant preference from the respondents. The following observations are being made now based on the data in Table 3:

- The most preferred branch of engineering chosen by alumni was *mechanical engineering* followed by *electronics & communication engineering* and *civil engineering* in that order.
- Although studies and specialization in a large number of branches is possible in the country, most alumni have preferred one of the eight branches specified only for their B.E. degree.

From these observations, it can be inferred that:

- It is possible that the order of preference observed under (a) above may not correct, as a large proportion of respondents has been left out of the survey.
- It is well known from popular perception and many other surveys that the preference among engineering students in descending order is ECE, CSE, EEE, IT, ME.
- This calls for widening the alumni participation covering TEQIP II institutions from all the States/UTs/CFIs in the feedback survey to get a better accuracy of the inference.

Table 3: Engineering Branches of Study by Alumni Respondents of TEQIP II Institutions
Total Number of Respondents: 5584, Question covered: Q28

S. No.	Specialization Branch at UG	Chosen by Alumni No. (%)	Preference Ranking
1.	Mechanical Engineering (ME)	18.89	1 st
2.	Electronics & Communication Engineering (ECE)	15.06	2 nd
3.	Civil Engineering (CV)	13.02	3 rd
4.	Computer Science & Engineering (CSE)	11.73	4 th
5.	Electrical & Electronics Engineering (EEE)	8.65	5 th
6.	Electrical Engineering (EE)	6.05	6 th
7.	Information Technology (IT)	4.64	7 th
8.	Chemical Engineering (CH)	2.60	8 th
	All other branches (~50) pooled together	13.36	Least preferred
	Total	100.00	

4.3 Specific Information Provided by Alumni:

In response to the *Questionnaire* of Annexure A administered by NPIU, alumni of TEQIPII institutions have provided specific information on a variety of topics covering their study period at their respective institutions. These include B.E. degree studies at the chosen institution, Industry-institute interaction, Placement activities, Alumni-related activities, Employment-related activities and Contributions to institutional progress. Responses to specific questions on all these have been categorized and given in Table 4 A-F, along with brief observations in each case. This is now discussed further along with additional observations and inferences.

(A) B.E. degree studies at chosen institution: As seen from Table 4A, this sub-section is covered by

S. Nos. 1-13 in the Table corresponding to responses to questions Q29-Q41 in the *Questionnaire*.

A few additional observations are being made now based on these responses:

- (a) Although CGPA evaluation scheme is widely used by project institutions, the coverage is yet not 100%.
- (b) Tutorials, internships and industry visits are not yet receiving serious attention at project institutions to improve teaching-learning.
- (c) While learning experience as student is in order, industry orientation and lab work quality seem to have been de-emphasized at the institution.
- (d) Too much emphasis seems to have been given by institutions in the personality development of students and not in encouraging their technical work.
- (e) Bridge courses, remedial classes and guidance/counseling do not seem to have attracted the attention they merit at the institutions.

From these observations, it can be inferred that:

- The institutions to which majority of alumni belong are either of the non-autonomous type or they are yet not engaged in using the autonomous status, if they already have it.
- Many institutions do not seem to appreciate the usefulness and importance of bridge and remedial courses in students' education and training.
- The need of good guidance and counseling facilities to take care of the students in their troubled times seems to have been glossed over by many institutions.

(B) Industry-Institute interaction: This is given in Table 4(B) under S. Nos. 14-18 covering questions Q42-Q46 in the *Questionnaire*. Based on the responses to the questions included herein a few additional observations are now being made:

- (a) There seems to be in general, a lack of understanding on the usefulness of this activity at majority of project institutions.
- (b) It is also seen that majority of project institutions are not encouraging/assisting their students in taking up industry internship, although this is an important part of engineering education.

From these observations, it can be inferred that:

- Establishing Industry-Institute interaction cell and enabling students to formally go through specified industry internship need to be given serious attention at project institutions.

(C) Placement activities: As seen from Table 4(C), this sub-section includes S. Nos. 19-22 covering questions Q47-Q50. It is seen from the observations on responses to these questions that the alumni respondents are generally satisfied at the quality of current placement facilities at the project institutions. However, a few inferences as follows can be drawn from these responses:

- Establishing 'finishing school' at each institution for better employability of graduates has not attracted the attention of project institutions, although its usefulness emphasized in TEQIP II PIP.
- Also, interaction between student groups and alumni in relation to placement activities yet at a low level requiring serious attention at the institutions.

(D) Alumni-related activities: These are presented in Table 4(D). As seen from this Table, S. Nos. 23-26 covering questions Q51-54 in the *Questionnaire* and their responses are included here. Based on these responses, a few additional observations are now given:

- (a) It is surprising to note that a good proportion of alumni do not seem to know the existence of Alumni Association at their institutions and over 30% of alumni are not members of AA as yet.
- (b) Alumni have indicated overwhelmingly that they took up B.E. course mainly for knowledge enhancement which is also very much surprising.

From these observations, it can be inferred that:

- Either the Alumni Association is not active in drawing students' attention/interest or the institution is not encouraging the growth of AA activities.

- The keenness of students in planning for their future career by enhancing their knowledge base during their studies is clear from this.

(E) Employment-related activities: As seen from Table 4(E), these are given under S. Nos.27-38 in the Table and cover questions Q55-Q66. Some observations in addition to those given in the Table are now given.

- (a) It is somewhat surprising that alumni going for higher education constitute a very small percentage, even smaller than the percentage of unemployed B.E. degree holders.
- (b) Government Employment Exchanges are virtually ineffective in getting employment for the engineering graduates nowadays.
- (c) While merit in engineering examinations is important, there are many other requirements to be satisfied by graduate engineers for getting employed easily.
- (d) Among the various employment sectors open for engineering graduates, MSMEs and self-employment appear to be the least preferred ones.
- (e) It is an interesting revelation that alumni do not take up teaching/education as a preferred career although the vacancies in this sector are growing year by year.
- (f) It is the feeling of a substantial number of alumni respondents that their present work profile is not related to their B. E. degree, which is yet another surprising finding from the study.

From these observations, it can be inferred that:

- By not choosing to take up higher education, alumni seem to be more concerned of the short-term gains through employment than the possible long-term benefits of higher education.
- Strengthening the Training and Placement Cell at each institution is the best route to ensure that all the graduates are gainfully employed.
- 'R&D and Innovation' initiatives at institutions need to be strong and self-sustaining to enable the graduating engineers taking up gainful employment in MSME and self-employment sectors.
- It is possible that as students they are not made aware of personal research, publications, patenting, sponsored R&D, consultancy and other opportunities open to engineering teachers.
- Matching of work profile with qualifications is an important requirement to ensure satisfying careers for engineers, which needs to be addressed in the institutional curricula and corrected.

(F) Contribution to institutional progress: This can be seen in Table 4(F) at S. Nos. 39, 40 covering questions Q67 and Q68. A few additional observations are now being made as follows on the responses listed in the Table:

- (a) While it is good to see that a large number of alumni are willing to contribute by way of expert lectures, it is surprising that an equally large number are not able to decide on what to do.
- (b) Majority of alumni suggesting to reschedule placement activities in 5th-6th semesters than in 7th semester as followed at present.

From these observations, it can be inferred that:

- Institutions may give suitable consideration to different possibilities of alumni support and decide a strategy for better results in consultation with their respective Alumni Associations.
- Rescheduling of placement activities needs to be given careful consideration to avoid its likely impact on the students' academic programme at the institutions.

Table 4: Response by Alumni of Project Institutes on Specific Questions in the Survey
Total Number of Respondents: 5584, Questions covered: Q29-Q68

S. No.	Question	Response*	Observation
A.	<i>B.E. Degree Studies at Chosen Institution (S.No.1-13)</i>		
1.	Q29: No. of years taken by you to complete B.E. Degree?	<ul style="list-style-type: none"> • 3 Years: 8.17% • 4 Years: 89.20% • 5 Years: 2.24% • >5Years: 0.34% 	Majority Regular: 4years Lateral entry: 3 years
2.	Q30: Your transition from 1 st to 2 nd Year of B.E. programme?	<ul style="list-style-type: none"> • Cleared all papers: 87.95% • Not cleared in all, but admitted to 2nd Year :11.62% 	Majority clearing all/ most papers at 1 st attempt
3.	Q31: Student evaluation scheme at your institution?	<ul style="list-style-type: none"> • CGPA scheme: 80.23% • Percentage marks: 19.77% 	Majority adopted CGPA scheme
4.	Q32: Basis of choice of institute for admission to B.E. course?	<ul style="list-style-type: none"> • Reputation: 92.67% • Branch preferred: 89.02% • Placement record:80.59% • Nearness: 48.23% • Other's advice: 60.49% 	Major basis: 1. Reputation, 2. Preferred branch, 3. Placement record
5.	Q33: Importance of teaching-learning modes at your institution?	<ul style="list-style-type: none"> • Lectures: 82.33% • Lab work: 78.71% • Tutorials: 57.95% • Projects: 78.11% • Internship: 60.06% 	Major modes used: 1.Lectures, 2.Lab. work, 3.Projects

		<ul style="list-style-type: none"> • Industry visits:58.15% 	
6.	Q34: Rating of learning experience at your institution?	<ul style="list-style-type: none"> • Syllabi structure: 75.82% • Contents of core: 79.17% • Teaching quality: 60.60% • Lab work quality: 59.53% • Ind. orientation: 38.55% • Int. assessment: 59.64% • Teacher help outside: 67.94% • Prof. activities: 54.20% 	Learning experience satisfaction rating: 1.Core contents, 2.Syllabi structure, 3.Teacher' help beyond classroom
7.	Q35: Rating of the facilities at the Institution?	<ul style="list-style-type: none"> • Classrooms: 76.40% • Lab space: 74.88% • Equipment quality: 63.40% • Library access: 73.96% • Books quality: 73.03% • Books quantity: 66.19% 	Facilities satisfaction rating: 1.Classrooms 2.Lab space 3.Library access
8.	Q36: Rating of experiences at the Institution?	<ul style="list-style-type: none"> • Co-curricular: 71.37% • Extra-curricular: 67.93% • Facility centre: 52.88% • Medical facility: 45.41% • Hostels: 52.02% • Safety adequacy: 57.59% 	Other experiences rating: 1.Co-curricular 2.Extra-curricular 3.Student' Facilities Centre
9.	Q37: Usefulness of studies at the Institution?	<ul style="list-style-type: none"> • To find good job: 59.12% • To do tech. work: 52.18% • To future career: 56.03% • To develop personality: 60.81% 	Usefulness ratings: 1. Personality dev. 2.Finding good job 3.Future career
10.	Q38: Bridge courses conducted at the Institution?	<ul style="list-style-type: none"> • Yes: 40.74% • No: 31.23% • Don't know: 28.03% 	Not too sure
11.	Q39: Remedial classes conducted at the Institution?	<ul style="list-style-type: none"> • Yes: 49.53% • No: 36.19% • Don't know: 14.27% 	Not too sure
12.	Q40: Guidance/counseling extended at the Institution?	<ul style="list-style-type: none"> • Yes: 49.03% • No: 33.18% • Don't know: 17.78% 	Not too sure
13.	Q41: Satisfaction level with studies at the Institution?	<ul style="list-style-type: none"> • High: 66.60% • Neutral: 20.2004% • Low: 13.16% 	Majority satisfied
B.	<i>Industry-Institute Interaction (S.Nos.14-18)</i>		
14.	Q42: Industry-Institute Interaction cell set up at the Institution?	<ul style="list-style-type: none"> • Yes: 38.32% • No: 39.80% • Don't know: 25.88% 	Not too sure
15.	Q43: Do you recommend setting up III cell at the Institution?	<ul style="list-style-type: none"> • Yes: 88.49% • No: 7.10% • Don't know: 4.40% 	Majority favouring III Cell

16.	Q44: Internship programme attended at the Institution?	<ul style="list-style-type: none"> • Yes, arranged by Inst.: 28.01% • Yes, arranged by self: 48.24% • No: 13.90% • Didn't try: 9.85% 	Self-arranged internship a majority
17.	Q45: Internship cell set up at the Institution?	<ul style="list-style-type: none"> • Yes: 25.39% • No: 53.47% • Don't know: 21.13% 	Not too sure
18.	Q46: Do you recommend setting up of Internship Cell at the Institution?	<ul style="list-style-type: none"> • Yes: 89.59% • No: 6.73% • Don't know: 3.68% 	Majority favouring Internship cell
C.	<i>Placement Activities (S. Nos.19-22)</i>		
19.	Q47: In which semester did placement activities begin at the Institution?	<ul style="list-style-type: none"> • Fifth: 10.10% • Sixth: 26.04% • Seventh: 50.16% • Eighth: 3.40% • None: 10.30% 	Major activities in 7 th semester
20.	Q48: Placement Cell set up at the Institution?	<ul style="list-style-type: none"> • Yes: 94.22% • No: 3.83% • Don't know: 1.95% 	Majority endorsing Placement Cell being available
21.	Q49: Rating of facilities at Placement Cell at your Institution?	<ul style="list-style-type: none"> • Dedicated, expert staff: 61.03% • Interview rooms: 70.80% • Equipped auditorium: 75.55% • Video conferencing: 53.18% • Computer facilities: 76.01% 	Placement Cell facilities rating: 1.Computers 2.Auditorium 3.Interview rooms
22.	Q50: Rating of placement related experiences at your Institution?	<ul style="list-style-type: none"> • Help in getting internship : 50.22% • Advance information on placement: 67.23% • Placement procedure made known: 62.51% • Campus interview arrangements: 66.51% • Placement performance evaluation: 51.83% • Company specific placement: 44.33% • Career guidance assistance: 55.12% • Soft skills training: 60.04% • Personality development: 65.96% • Finishing school arranged : 00.00% • Interactions-students and alumni: 45.12% 	Placement experiences rating: 1. Giving advance information 2.Campus interviews 3. Personality dev.

		<ul style="list-style-type: none"> • Entrepreneurship development: 42.32% 	
D.	<i>Alumni-related Activities (S. Nos.23-26)</i>		
23.	Q51: Alumni Association (AA) set up at your Institution?	<ul style="list-style-type: none"> • Yes: 80.44% • No: 7.34% • Don't know: 12.21% 	Majority endorsing AA
24.	Q52: Registered member of AA of your Institution?	<ul style="list-style-type: none"> • Yes: 68.59% • No: 31.41% 	Majority AA members
25.	Q53: Any extra training/course taken during your B.E. studies?	<ul style="list-style-type: none"> • Yes: 33.13% • No: 66.87% 	Majority not taken extra studies
26.	Q54: Reason for taking up the B.E. course you chose?	<ul style="list-style-type: none"> • To enhance knowledge: 72.48% • To develop IT skills: 26.01% • To develop soft skills: 16.47% • To develop entrepreneur –ship skills: 14.32% • Other: 14.11% 	Majority endorsing knowledge enhancement
E.	<i>Employment-related Activities (S. Nos.27-38)</i>		
27.	Q55: Your current employment status?	<ul style="list-style-type: none"> • Full time employed: 50.11% • Self-employed: 1.77% • Trainee: 2.35% • Contract employee: 22.06% • Opted for higher education: 5.53% • Not employed: 14.15% • Other: 	Majority in full-time employment
28.	Q56: How did you get your first job after graduation?	<ul style="list-style-type: none"> • Campus placement: 61.48% • Responding to advt.: 11.39% • Govt. employment exchange: 2.05% • Private employment agency: 4.71% • Personal contacts: 14.95% • Contacting employers: 2.41% • Other: 	Majority by campus placement.
29.	Q57: How long did you take to get your first job after B.E.?	<ul style="list-style-type: none"> • ? 	Not clearly responded.
30.	Q58: How many jobs did you apply for after graduation?	<ul style="list-style-type: none"> • Zero: 30.95% • One: 18.20% • Two: 11.77% • Three: 7.59% • Four: 5.02% • More:0 	Majority applied for one job only.
31.	Q59: How important were these for getting employed?	<ul style="list-style-type: none"> • Syllabi structure: 62.47% • Contents of core: 73.68% 	Most important ones:

		<ul style="list-style-type: none"> • Institute's reputation: 77.80% • Departmental reputation : 64.28% • CGPA/% Marks scored: 61.73% • Work experience during study: 74.84% • Core tech. knowledge: 83.85% • Soft skills: 87.46 • Computer skills: 81.06% 	<ol style="list-style-type: none"> 1.Soft skills 2.Core technical knowledge 3.Computer skills.
32.	Q60: Any professional training received from first employer?	<ul style="list-style-type: none"> • Yes: 68.59% • No: 31.41% 	Majority endorsing training by employer
33.	Q61: How many times you changed your employer since first taking up job?	<ul style="list-style-type: none"> • Nil: 78.65% • Once: 14.58% • Twice: 5.18% • Thrice: 1.16% 	Majority endorsing no job change since first employment.
34.	Q62: Your current location of workplace?	<ul style="list-style-type: none"> • State in which graduated: 59.24% • Outside the state in which graduated: 36.46% • Abroad: 4.28% 	Majority employed in the same state where graduated.
35.	Q63: How long are you working with your present employer?	<ul style="list-style-type: none"> • ? 	Not clearly responded.
36.	Q64: Type of employer you are working with?	<ul style="list-style-type: none"> • Central Govt.: 4.73% • State Govt.: 3.25% • Self-employed: 0.64% • Public limited co.: 8.11% • Private limited co.: 77.27% • SSI: 1.48% • Informal employment: 0.39% • Other: 4.12% 	Major employer types: <ol style="list-style-type: none"> 1. Private Ltd. Co. 2. Public Ltd. Co. 3. Central Govt.
37.	Q65: Area/Dept. of your current job?	<ul style="list-style-type: none"> • Administration: 1.42% • Management: 3.99% • R&D: 14.26% • Product design: 7.41% • Production, planning and control: 5.09% • Materials management: 1.16% • Production/Manufacturing: 6.05% • QC: 4.15% • Testing: 7.15% • Applications engineering: 12.19% • Sales/Marketing: 2.35% • Service and support: 12.69% • Training: 1.84% 	Major areas/ 25 pts...: <ol style="list-style-type: none"> 1.R&D 2. Appl. Engineering 3.Product design

		<ul style="list-style-type: none"> Teaching/education: 2.99% Other: 10.07% 	
38.	Q66:Relationship of your work profile with your B.E. Degree:	<ul style="list-style-type: none"> Fully related: 47.46% Partly related: 30.68% Not related: 21.86% 	Majority endorsing work profile with B.E. Degree
F.	<i>Contribution to Institutional Progress (S. Nos.39-40)</i>		
39.	Q67: How would you contribute to the progress of your Institution?	<ul style="list-style-type: none"> Helping students in real-life projects: 28.64% Giving expert lectures for students: 38.88% Permitting use of your facilities by students: 13.36% Extending placement support to students: 29.98% Helping arrange industry visits for students: 20.31% Supporting financially weak students: 11.77% Arranging faculty training in industry: 13.47% Contributing to working of II Interaction cell: 16.85% Not able to decide now: 39.76% Other: 2.92% 	Major willingness areas: 1.Expert lectures 2.Placement support 3.Help in real-life projects
40.	Q68: Your opinion on the semester to launch placement activities?	<ul style="list-style-type: none"> Fourth: 15.54% Fifth: 30.10% Sixth: 46.02% Don't know: 8.33% 	Most preferred semester: Sixth

- 'Very good' and 'good' ratings combined together as rating 1 for convenience.

5. Recommendations

Recommendations of the Tracer Study are now given below in two categories, i.e., General and Specific as a follow up of the findings of the Study and inferences discussed in Section 4.

5.1 General Recommendations:

- More efforts need to be made by NPIU to associate all the 190 project institutions in the country in the Survey and get most of their alumni responding to the *Questionnaire*.
- Websites of NPIU/SPFUs/Project institutions to be used widely to publicize the Survey and the institutions to reach out all their respective alumni seeking their response promptly.

- (c) The present *Questionnaire* being mainly oriented to UG institutions under TEQIP II, due attention needs to be given to design a *Questionnaire* for use with PG institutions.
- (d) Expert review and improvement of questions included in the *Questionnaire* need to be done to enable the alumni to respond to them in less time and be more focused in the responses.
- (e) This National Report to be used as a model for generating State/UT/CFI-wise and project institution-wise Reports by using relevant data made available from Annexure B document.

5.2 Specific Recommendations:

- (a) Project institutions need to give priority attention to enhance the quality, standard and relevance of their academic programmes taking advantage of their autonomous status.
- (b) Non-autonomous project institutions need to take early steps to have academic and other autonomies so as to be able to pass on the benefits to their students.
- (c) Project institutions need to be encouraged to set up Industry-Institution Interaction Cells and/or activate them to benefit their students through exposure to industry requirements.
- (d) Project institutions need to be facilitated to have close linkages with leading institutions of higher learning and R&D to develop a culture of R&D and innovation beneficial to students.
- (e) 'Findings & Inferences' in Section 4 to be given due attention at project institutions so that students benefit from *studies, industry exposure, placement, AA and employment activities*.

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