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The World Bank

Report No: ICR0000570

IMPLEMENTATION COMPLETION AND RESULTS REPORT  
(IDA-34130)

ON A

CREDIT

IN THE AMOUNT OF SDR 48.9 MILLION  
(US\$ 64.9 MILLION EQUIVALENT)

TO

INDIA

FOR A

THIRD TECHNICIAN EDUCATION PROJECT

December 26, 2007

Education Sector  
Human Development Unit  
South Asia Region

CURRENCY EQUIVALENTS  
(Exchange rate effective June 30, 2007)  
Currency Unit - Indian rupee (Rs.)  
Rs. 100.00 = US\$ 2.466  
US\$ 1.00 = Rs. 40.55

FISCAL YEAR  
April 1 - March 31

ABBREVIATIONS AND ACRONYMS

A&N	-	Andaman & Nicobar Islands
AICTE	-	All India Council for Technical Education
DEA	-	Department of Economic Affairs, Ministry of Finance
DTE	-	Directorate of Technical Education
EdCIL	-	Educational Consultants India Ltd.
FM	-	Financial Management
FMS	-	Financial Management System
GoI	-	Government of India
IBRD	-	International Bank for Reconstruction and Development
IDA	-	International Development Association
IEG	-	Independent Evaluation Group
IRG	-	Internal Revenue Generation
ISO	-	International Standards Organization
J&K	-	Jammu & Kashmir
JKPCC	-	Jammu & Kashmir Project Construction Corporation
LACI	-	Loan Accounting Change Initiative
LRUC	-	Learning Resource Utilization Center
MHRD	-	Ministry of Human Resource Development
MIS	-	Management Information System
NCB	-	National Competitive Bidding
NTTF	-	Nettur Technical Training Foundation
NITTTR	-	National Institute for Technical Teachers' Training and Research
NPD	-	National Project Directorate
NPIU	-	National Project Implementation Unit
OED	-	Operations Evaluation Department (now IEG) ( World Bank)
PAD	-	Project Appraisal Document
PDO	-	Project Development Objective
PWD	-	Public Works Department
QAG	-	Quality Assurance Group (World Bank)
SDR	-	Special Drawing Rights
SOE	-	Statement of Expenditure
SPIU	-	State Project Implementation Unit
Tech. Ed.	-	Technician Education
UT	-	Union Territory

Vice President: Praful C. Patel  
Country Director: Isabel M. Guerrero  
Sector Manager: Michelle Riboud  
Project Team Leader: Shashi K. Shrivastava  
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**INDIA**  
**THIRD TECHNICIAN EDUCATION PROJECT**

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<b>A. Basic Information</b>			
Country:	India	Project Name:	Third Technician Education Project
Project ID:	P050658	L/C/TF Number(s):	IDA-34130
ICR Date:	12/26/2007	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERNMENT OF INDIA
Original Total Commitment:	XDR 48.9M	Disbursed Amount:	XDR 48.9M
<b>Environmental Category: C</b>			
<b>Implementing Agencies:</b> Ministry of Human Resource Development			
<b>Cofinanciers and Other External Partners:</b>			

<b>B. Key Dates</b>				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	12/13/1999	Effectiveness:	01/17/2001	01/17/2001
Appraisal:	03/22/2000	Restructuring(s):		02/04/2004
Approval:	09/07/2000	Mid-term Review:		02/04/2004
		Closing:	06/30/2006	06/30/2007

<b>C. Ratings Summary</b>	
<b>C.1 Performance Rating by ICR</b>	
Outcomes:	Highly Satisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

<b>C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)</b>			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory
<b>Overall Bank Performance:</b>	Satisfactory	<b>Overall Borrower Performance:</b>	Satisfactory

<b>C.3 Quality at Entry and Implementation Performance Indicators</b>			
<b>Implementation Performance</b>	<b>Indicators</b>	<b>QAG Assessments (if any)</b>	<b>Rating</b>
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	Satisfactory
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

<b>D. Sector and Theme Codes</b>		
	<b>Original</b>	<b>Actual</b>
<b>Sector Code (as % of total Bank financing)</b>		
Sub-national government administration	10	10
Tertiary education		20
Vocational training	90	70
<b>Theme Code (Primary/Secondary)</b>		
Access to urban services and housing	Primary	Secondary
Education for the knowledge economy	Primary	Primary
Gender	Secondary	Secondary
Participation and civic engagement	Secondary	Secondary
Rural services and infrastructure	Primary	Secondary

<b>E. Bank Staff</b>		
<b>Positions</b>	<b>At ICR</b>	<b>At Approval</b>
Vice President:	Praful C. Patel	Mieko Nishimizu
Country Director:	Isabel M. Guerrero	Edwin R. Lim
Sector Manager:	Michelle Riboud	Emmanuel Y. Jimenez
Project Team Leader:	Shashi K. Shrivastava	Shashi K. Shrivastava
ICR Team Leader:	Andreas Blom	
ICR Primary Author:		

## **F. Results Framework Analysis**

### **Project Development Objectives (from Project Appraisal Document)**

The objective of the project is to assist the industrially and economically underdeveloped, and geographically remote states of the (Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura), Jammu & Kashmir, and the union territory (UT) of

Andaman & Nicobar Islands to expand capacity and improve the quality and efficiency of technician (polytechnic) education to meet the specific economic needs of each state. The project will also aim at increasing access of some disadvantage sections of society (women, scheduled tribes, and rural youth) to technician education and training.

**Revised Project Development Objectives (as approved by original approving authority)**

**(a) PDO Indicator(s)**

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
<b>Indicator 1 :</b>	Percent of polytechnic graduates employed/self-employed in their field of training within one year of graduation			
Value quantitative or Qualitative)	AN 8; APR NA; J&K 30; MGL 40; MZR NA; NGL 50; SKM NA; TPR 60%	AN 65; APR 65; J&K 65; MGL 65; MZR 65; NGL 65; SKM 65; TPR 65%		AN 78; APR 46; J&K 45; MGL 64; MZR 78; NGL 70; SKM 88; TPR 70%
Date achieved	08/01/2000	06/30/2007		06/30/2007
Comments (incl. % achievement)	Achieved (108%)			
<b>Indicator 2 :</b>	Percentage of women students in enrollment in formal programs in each project states			
Value quantitative or Qualitative)	AN 38; APR NA; J&K 29; MGL 15; MZR 50; NGL 40; SKM NA; TPR 25%	AN 40; APR 45; J&K 40; MGL 40; MZR 68; NGL 47; SKM 33; TPR 50%		AN 46; APR 37; J&K 41; MGL 23; MZR 60; NGL 37; SKM 14; TPR 47%
Date achieved	08/01/2000	06/30/2007		06/30/2007
Comments (incl. % achievement)	The ambitious target partially achieved (81%). Enrolment of women increased from 487 to 3,038 (625%). Women made up 38 percent of the student body in 2006/07 - against the national average of 22%.			
<b>Indicator 3 :</b>	Percentage of Scheduled Cast/Scheduled Tribe students in formal Programs in polytechnics			
Value quantitative or Qualitative)	AN 3; APR NA; J&K 50; MGL 95; MZR 95; NGL 98; SKM NA; TPR 47%	AN 11; APR 70; J&K 7; MGL 95; MZR 95; NGL 98; SKM 50; TPR 47%		AN 2; APR 74; J&K 14; MGL 99; MZR 92; NGL 100; SKM 43; TPR 47%
Date achieved	08/01/2000	06/30/2007		06/30/2007
Comments (incl. % achievement)	Achieved (100%)			

**(b) Intermediate Outcome Indicator(s)**

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
<b>Indicator 1 :</b>	Increased total enrollment capacity for diploma programs			
Value (quantitative or Qualitative)	Capacity: 3630	Capacity: 8,135		Capacity: 9133
Date achieved	08/01/2000	06/30/2007		06/30/2007
Comments (incl. % achievement)	Achieved (122%)			
<b>Indicator 2 :</b>	Percentage of curricula revised / developed during project period			
Value (quantitative or Qualitative)	Nil	100		100
Date achieved	08/01/2000	06/30/2007		06/30/2007
Comments (incl. % achievement)	Achieved (100%) - some curricula revised twice ( not included in percentage calculation)			
<b>Indicator 3 :</b>	Average time (in years) taken by students to complete a three-year diploma program			
Value (quantitative or Qualitative)	4.5	3.4		Average: 3.3 AN 3.2; APR 3.4; J&K 3.2; MGL 3.4; MZR 3.5; NGL 3.5; SKM 3.3; TPR 3.1
Date achieved	08/01/2000	06/30/2007		06/30/2007
Comments (incl. % achievement)	Achieved (102%). Not all polytechnics have an information system capable of tracking students across years. Thus for those polytechnics, this indicator relies on sampled information.			

**G. Ratings of Project Performance in ISRs**


No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	02/02/2001	Satisfactory	Satisfactory	0.00
2	06/01/2001	Satisfactory	Satisfactory	2.89
3	12/20/2001	Satisfactory	Satisfactory	3.29
4	05/28/2002	Satisfactory	Satisfactory	3.62
5	11/25/2002	Satisfactory	Satisfactory	6.04
6	06/23/2003	Satisfactory	Satisfactory	11.09

7	12/01/2003	Satisfactory	Satisfactory	14.28
8	05/10/2004	Satisfactory	Satisfactory	20.90
9	11/29/2004	Satisfactory	Satisfactory	29.24
10	05/24/2005	Satisfactory	Satisfactory	41.14
11	11/04/2005	Satisfactory	Satisfactory	48.82
12	05/09/2006	Satisfactory	Satisfactory	54.66
13	11/08/2006	Satisfactory	Satisfactory	62.96
14	03/23/2007	Satisfactory	Satisfactory	63.72
15	06/27/2007	Highly Satisfactory	Satisfactory	68.52

### H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
02/04/2004		S	S	16.34	

### I. Disbursement Profile

	
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# 1. Project Context, Development Objectives and Design

## 1.1 Context at Appraisal

1. ***Liberalization of the Indian economy, its gradual integration with the world economy and rapid transformation into a knowledge-based society are increasing the demand for a well-trained workforce-*** a workforce that is not only literate and has mastered specific skills, but is also able to acquire new skills and knowledge independently. The pace of change and the intensity of competition are both likely to increase as the economy continues to reform.

2. ***The northeastern states, Sikkim and Andaman & Nicobar Islands, with comparatively small populations, have already achieved rates of primary and secondary school enrolments and literacy that are much higher than the national average.*** However, despite the existence of a better educated labor force and considerable natural resources, these states/union territory (UT) have not been able to benefit much from the ongoing economic reforms in India due to their locational disadvantage, difficult terrain, extremely low population densities, and lack of competent technical manpower. A significant proportion of the population continues to live below the poverty line. Jammu & Kashmir too has not been able to exploit its full economic potential due to inadequacy of technical manpower and the periodic disturbed conditions. Most of these states have a very high percentage of people belonging to various tribal communities and/or minorities. Lack of opportunities for proper training and employment is resulting in frustration amongst the youth. The Government of India has supported major schemes for economic and industrial development of these states. The success of these investments will depend on, amongst other things, the availability of quality technical manpower in adequate numbers.

3. ***The main sector issues identified in a Bank sector study on Scientific and Technical Manpower Development in India from 2000 were:*** (a) over-centralization and lack of autonomy and accountability of institutions; (b) resource constraint and wastage; (c) poor quality and relevance; (d) poor technology/infrastructure support; and (e) limited access and regional disparity (equity).<sup>1</sup>

4. ***The Bank rationale for the project was linked to the following elements of the Country Assistance Strategy (CAS) for India from 1997*** (Report No. 17241-IN): (a) increase the efficiency and responsiveness of technical training institutions to the changing labor market; (b) support to key areas of policy reforms through the program's reforms to improve effectiveness and efficiency of technical education; (c) focus on poverty alleviation activities through greater participation of women, tribal communities and other disadvantaged groups in technician education, and formal and non-formal programs for technical training of the rural and urban poor; and (d) Bank support for better infrastructure facilities for technical education in the states.

5. ***The Bank's value added to the project was oriented towards capacity building and the discipline attending to implementation of an investment project assisted by the World Bank.*** In the case of the comparatively deprived and isolated States, this was thought to be even more important than it was for the States covered by the first and the second Technician education projects. Further, the Bank would increase the special attention to equity including the economic needs of women and tribal communities and the necessity for balanced development of the technological infrastructure.

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<sup>1</sup> India Scientific and Technical Manpower Development in India, Report No. 20416-IN, World Bank (2000).

## **1.2 Original Project Development Objectives (PDO) and Key Indicators (as approved)**

6. The objective of the project was to assist the industrially and economically underdeveloped, and geographically remote states of the northeastern region (Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura), Jammu & Kashmir, and the union territory (UT) of Andaman & Nicobar Islands to expand capacity and improve the quality and efficiency of technician (polytechnic) education to meet the specific economic needs of each state. The project also aimed at increasing access of some disadvantage sections of society (women, scheduled tribes, and rural youth) to technician education and training.

## **1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification**

7. Neither the Project Development Objectives nor Key Indicators were formally revised and approved by the World Bank's Board.

## **1.4 Main Beneficiaries,**

8. *The PAD identified the following as main beneficiaries:*

- Students completing 10/12 grade, who wish to develop specialized skills for employment; about 8,000 regular students will be enrolled in project polytechnics and over 2,500 students will graduate every year after all new programs are introduced;
- Tribal groups and women from low and middle-income families will constitute majority of students;
- The continuing education and non-formal training programs will primarily cater to the needs of youth (largely from rural and urban poor families); about 10,000 persons are expected to undergo such training during the project period;
- The polytechnics will serve the needs of small and medium-scale industries and various government departments through training of quality manpower, continuing education programs, and consultancy services;
- Community service activities of the project polytechnics will be targeted to cover 8-10 villages or about 500 poor households near each polytechnic during the project, and
- The general administration in project states could also benefit from the experience gained during the project through institutional networking, computerization of administrative and financial records, performance-based financing, transparent methods of procurement of civil works/goods/services, and systematic project management through monitoring and evaluation.

## **1.5 Original Components (as approved)**

9. *The project covering a total of 12 existing and 6 new polytechnics in the eight project states had three components:* (i) Developing/ expanding capacity to provide increased access to technician education; (ii) Enhancing quality of education to produce better trained technicians; and (iii) Improving efficiency through better planning, administration and utilization of the system and increasing its responsiveness to emerging labor market needs.

- (i) Capacity Development/Expansion (US\$ 48.18 million) will be achieved by: (a) establishing six new co-educational Polytechnics and a skill development center, (b) strengthening 12 existing polytechnics and introducing new programs, (c) introducing continuing education and non-formal training programs for industry and community, and (d) providing student and faculty housing facilities.
- (ii) Quality Enhancement (US\$ 22.85 million) will be achieved by: (a) modernizing existing laboratories and workshops, (b) developing/revising curricula to meet labor market needs

as well as imparting entrepreneurial skills, (c) improving staffing and imparting staff training, (d) increasing utilization of learning resources and media, and (e) promoting interaction with industry and community.

- (iii) Efficiency Improvement (US\$ 9.05 million) will be achieved by: (a) establishing/strengthening state boards/councils/directorates and other support units dealing with technician education to provide better planning, monitoring and guidance, (b) conducting research studies for systemic reforms, (c) instituting computer-based project and financial management systems, (d) providing substantial academic, financial and administrative autonomy with accountability to project polytechnics, (e) networking of polytechnics with other institutions/organizations, and (f) enhancing state-level policy support for technician education

## 1.6 Revised Components

10. None of the components were revised.

## 1.7 Other significant changes

11. *At mid-term review, the GoI and the Bank assessed that costs savings permitted financing of three new polytechnics, thereby increasing enrolment capacity.* These were not planned for in the PAD and represent an over-achievement. The states of Tripura and Jammu & Kashmir managed to design, contract, construct, and equip the three new Polytechnics in less than three years.

12. *The project scaled-up support to technical and vocational education and training (TVET).* At mid-term, US\$ 8.9 million of unallocated loan proceeds were reserved to institutionalize and support scaling-up of vocational training courses. The financing supported the creation of 19 additional Skills Development Centers, in addition to the one that was planned in the PAD. Further, two extension centers were added to the six already planned for the Andaman & Nicobar Islands.

13. *The scope of outside quality certification was increased during project implementation.* This went beyond the original project design. External quality certification was achieved through ISO-9000 certification and academic accreditation by the National Board of Accreditation.

14. *The project was extended one year on the basis of three factors:* (i) the mountainous and rocky construction sites required unforeseen groundwork. Further, the remoteness of the construction sites implied difficulties in identifying qualified contractors, transporting equipment and supplies to the sites; (ii) natural calamities such as the 2004 Asia Tsunami in Andaman & Nicobar Islands, heavy snowfall and earthquake in Jammu & Kashmir, and severe land slides in Nagaland delayed implementation (see section 2), and (iii) many of the states were first time implementers of externally funded project and possessed limited institutional capacity.

## 2. Key Factors Affecting Implementation and Outcomes

### 2.1 Project Preparation, Design and Quality at Entry

15. *Quality-at-Entry was Satisfactory* for the following reasons: the design built upon lessons learned from earlier projects, corrected earlier weaknesses, and was more ambitious in target setting. It benefited from a thorough sector study. It foresaw critical risks and substantially mitigated those risks in project implementation. Lastly, the project was swiftly prepared, while still conducting consultation with all stakeholders.

16. *The project improved design from the second Technician Education.* The third Technician Education project increased focus on skills in high demand among employers, such as

soft skills (team work, presentation skills, communication skills, etc.), problem-oriented skills, and entrepreneurial skills. Further, the project scaled-up effective networking by linking the supported polytechnics with successful polytechnics in earlier projects and with NITTTR

17. ***The design incorporated lessons learned from relevant projects.*** The project design followed recommendations from: (i) an Operations Evaluation Department (OED) review of projects in technical education and training in India by involving more state institutions, increase efforts to raise internal revenue generation (IRG), and set more ambitious targets for access for women, and (ii) the ICR for the Technician Education project I and II (Tech. Ed. I and II). In addition, the design emphasized up-front policy reforms, such as autonomy, IRG policies, and strengthening of state boards, which the ICR found had not sufficiently taken place in Tech. Ed. I and II.<sup>2</sup>

18. ***The project design was informed by a sector study on technical education*** allowing for a comprehensive sectorial approach to reform of technical education in the concerned states/UT.

19. ***The design identified the critical risks.*** The PAD discussed the following substantial-and medium-level risks of the project: (i) expected policy reform may be delayed, (ii) limited opportunities for industrial linkages in the states, (iii) limited demand for new programs, (iv) slow procurement, (v) funds flow from states may not be adequate, (vi) faculty recruitment for new programs may pose difficulties due to non-availability at the local level, (vii) civil work may be delayed due to remoteness of location and hilly terrain and limited fair weather—the only risk rated substantial, and (viii) weak implementation capacity. Risk (i) to (vi) were effectively mitigated by the proposed actions, see Section 3. Risk (vii) and (viii) resulted in a one year extension of the project. In hindsight, the risk related to procurement was underestimated and/or the mitigating action of appointing procurement consultants was insufficient.

20. ***The Quality Assurance Group of the Bank (QAG) assessed the Quality of Entry to be Satisfactory, albeit with shortcomings.*** The assessment praised the government's ownership, the thorough preparation of the technical aspects, and the focus on equal access to training for women. The review warned that: (i) the project was supply-driven and did not sufficiently involve the private sector, (ii) the PAD was over-optimistic in terms of demand for graduates in the state/UT economies and the economic analysis was insufficiently detailed, (iii) the PAD could have further described intended policy reforms and clearly defined the key indicator for the reforms, and (iv) the PDO contained a multiplicity of conflicting objectives. In hindsight, this

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<sup>2</sup> The project implementation structure maintained the same nomenclature as in the Tech. Ed. I and II projects, but there was a larger involvement of the state and union entities in implementation. In most states, the State Directors of the project were either part of the state directorate of technical education or a principal of a supported polytechnic. At the union level, the Project Director was over an extended period also an official in the Ministry of Human Resource Development (MHRD). This closer involvement of the government institutions ensured a strong ownership of the project and a sustainable strengthening of institutional capacity. Further, the third phase built upon the capacity in the NITTTRs. Nevertheless, the project could have formally involved the All-India Council for Technical Education, AICTE, as part of project implementation. AICTE oversees technical education in India. Such formal collaboration could have increased dissemination of best practice and beneficial interaction for both AICTE and the participating states and polytechnics. However, the Government of India did not endorse a formal involvement of AICTE in the project at the time of project preparations.

report finds warning (iii) to be partially appropriate, while warning (ii) and (iv) seem overly zealous.<sup>3</sup>

21. ***The Project Development Objective (PDO) was clear, concise, and ambitious.*** Further, the project's activities could reasonably be expected to influence the PDO during the lifetime of the project. The PDO was closely linked to the monitoring and evaluation framework, which contained baseline values and targets. The PDO was ambitious in the sense that it targeted improvements in five key aspects of technician education: expansion, quality, efficiency, relevance, and equity. As recommended by the QAG review, the PDO could have established primary objectives and secondary objectives as a way to differentiate the importance of each the five objectives of reform. This differentiation could explicitly have guided implementation when deciding upon activities that involved trading-off improvement in one objective over another.<sup>4</sup>

## **2.2 Implementation**

22. ***Implementation was rated satisfactory at all times of implementation.*** The project was at no time flagged as a project at risk due to continuous efforts from the states, federal government, and the Bank. During the first two years of implementation, there were significant efforts by the NPIU and the Bank team to support the slower performing states in accelerating implementation. Thereafter, implementation progressed according to plan.

## **2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization**

23. ***The design of the monitoring and evaluation system was better than the average project at the time of approval.*** The key indicators were clearly defined. They were appropriately linked to component output, project output, and project impact. The number of indicators was suitable. The PAD contained baseline values in most cases, and targets were ambitious and unambiguous.<sup>5</sup>

24. ***The M&E framework was implemented, actively utilized, and acted upon during implementation.*** There was a strict and periodic monitoring of indicators as indicated in each Review report by the NPIU and the Aide memoirs. Further, polytechnics and state implementers commissioned tracer studies to establish the indicators related to the labor market performance of graduates. Considering the dearth of data at project initiation, the concurrently available information on all critical aspects of the education process is noticeable. The M&E framework

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<sup>3</sup> For warning (iii), the PAD clearly describes intended provision of substantial autonomy to the support polytechnics, but the key indicator for policy reforms could be clarified. Private sector involvement was sought not through provision but through involvement in the educational process (curriculum design, industry training, industry assessment, and job-interviews. In hindsight, these strong linkages from the supported public institutions to industry achieved the desired targets of employment. As discussed in section 4, these linkages seem likely to be sustainable, but it cannot be guaranteed. Lastly, the QAG warnings led the Bank team to further increase its emphasis on private sector involvement, which pre-empted the realization of the warnings.

<sup>4</sup> There exist trade-offs between the five objectives. However, they are not necessarily conflicting as suggested by the QAG review. As shown by the outcomes of the project, it is possible to achieve improvements on all five objectives in the same project.

<sup>5</sup> Two impact indicators could have been fully defined at approval: (i) effectiveness and stage of implementation of proposed systemic reform, and (ii) nature and level of interaction with local community and industry. As explained in Annex 2, these indicators were constructed ex-post as composite indicators determined by a combination of other impact and output indicators.

included an impact study and two utilization studies, which each summarized detailed utilization reports from each of the 21 institutions. These studies relied upon field visits to each supported polytechnic and large surveys of beneficiaries as reported below and in Annex 5.

#### **2.4 Safeguard and Fiduciary Compliance**

25. ***Social assessment and Tribal plan was successfully implemented.*** Safeguards for indigenous people were triggered for this project. The tribal plan was implemented as described in the PAD. In particular, the project undertook an extensive social assessment following project approval. This plan interviewed more than 150 interviewees for each participating state including NGOs, local people in the communities, and opinion leaders. The assessment collected suggestions from the communities regarding educational programs, needs, constraints, non-formal training and other types of interventions that were subsequently introduced. As explained below, this is likely to have been one of the reasons behind the improvements in access of women, tribal, and rural students, and the increase in community interactions.

26. ***Procurement process was decentralized to the State level.*** Slow procurement through a centralized agency constituted the Achilles heel of the Second Technician Education project. Decentralized procurement was found to be more nimble (ICR No. 20415-IN). As a consequence, the procurement processes were fully decentralized for the third Technician Education project. Each State Project Implementation Unit (SPIU) was assigned the procurement responsibility in order to increase coordination with approving state authorities and accelerate the release of funds. Beyond reviews of the first National Competitive Bidding for goods and for civil works for each state, prior review only existed for International Competitive Bidding (ICB) and for all civil works above US\$ 300,000. Other procurement only required post reviews. For works five states engaged national level construction agencies as procurement consultant. Three depended on their own departments/ agencies. For goods, national level procurement agencies were selected competitively by each state with the approval of the Bank. To build local capacity at the state level, NPIU conducted a series of training sessions in procurement and provided guidance to the SPIUs. States complained about slow processing by the procurement consultants. After mid-term, the contracts with procurement consultants were gradually closed and states undertook procurement independently.

27. ***Adherence to procurement guidelines for local procurement was insufficient:*** Although provided in the legal agreement, the project was not subjected to regular post-procurement reviews. The report of the first review (for 2004-05) conducted in 2006 was not made available to states. The detailed post-review for 2005-06 for all states/UT conducted after the project closing found deviations from guidelines in all 8 States/UT. The post review examined 99 contracts out of 407 for the year (24 percent). It found deviations from procurement guidelines in 53 contracts. Of these, 18 contracts (including 9 local shopping contracts from Nagaland and 3 works contracts from J&K) had significant deviations. The deviations were among others: use of state procedures instead of Bank procedures, splitting up of seemingly similar purchases to avoid using national competitive bidding, insufficient documentation of 3 quotes under shopping, insufficient adherence to bidding dates and bid opening procedures. The Bank has sought response from the states to the observations to take appropriate action.

28. ***Oversight of the local procurement process was insufficient.*** The decentralization of the procurement process was appropriate in order to build local procurement capacity and speed up procurement. Further, government officials appreciated the use of Bank guidelines and standard documents. In several states, standard clauses in Bank documents were invoked to ensure contractors delivered high quality civil works. The Bank team undertook regular visits to institutions and SPIUs—all institutions were visited during the project period. These visits included review of procurement processes and usage of procured items. In the first half of the

project, a procurement specialist was part of the visiting team. Further, the Bank team and the National Project Director followed up on two specific complaints, which led to termination of services of a procurement consultant, review of a works contract before award, and a report to the Bank's independent Department for Integrity regarding fraudulent certificate of a local contractor. Nevertheless, the Bank and Borrower's oversight was insufficient to ensure sufficient adherence to procurement guidelines for local procurement. Given the new modality of decentralized procurement, oversight should have been more careful. This could have been undertaken through, more frequent post-reviews, and more direct oversight of Bank procurement specialists. More Bank oversight would have increased the hassle-factor of working with the Bank and slowed down the procurement process, but this seemed to have been necessary. Earlier post reviews with follow-up on findings and dissemination to state governments would probably have strengthened state officials' strict adherence to Bank procurement guidelines without slowing down significantly the procurement processes.

29. ***There were no major Financial Management (FM) issues, but oversight could have been strengthened.*** Financial Management oversight was mostly limited to desk review of documents, and usually did not include field visits/ interaction with project states or institutions. Therefore review of FM aspects relating to internal controls, staffing, effective utilization of funds etc. was inadequate. Audits were carried out as required and submitted timely with some states submitting audit reports with 1-2 months delay. Though audit reports did not unearth major Financial Management issues, these were focused on review of eligibility of expenditure for reimbursement from the Bank.<sup>6</sup> Increased participation of FM specialists in review missions or other missions would have strengthened Bank guidance and review of financial management. This shortcoming has been taken into account in the on-going TEQIP project where the Bank's FM specialist has participated regularly in the review missions since project inception.

## **2.5 Post-completion Operation/Next Phase**

30. ***The transition from project finance to regular budgeted state finance has to a large extent been achieved.*** The project financed few recurrent costs. Recurrent costs for operations funded out of the regular budget grew gradually over the life time of the project. Participating States have allocated recurrent expenditures for the polytechnics for FY07/08. Copies of state budgets for fiscal year 07/08 and/or financial sustainability plans have been reviewed. Therefore, the recurrent budget will fund the institutions for teacher and administration salaries, training and maintenance of infrastructure and equipment. Further, each polytechnic prepared an institutional sustainability plan with a budget as part of their strategic planning.<sup>7</sup>

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<sup>6</sup> The project equally financed the development and institution of a computer-based project and financial management system. This was a requirement under the mandatory Loan Administration Change Initiative (LACI) in Bank project approved from 1998 to 2001. This system was successfully developed by NPIU and installed and tested on a pilot basis in the SPIU in Andaman and Nicobar Islands in 2001. Hardware and software and training were provided to other states also. However, the scaling-up proved cumbersome, since the requirements for system made it difficult to integrate with existing institutional, state and federal accounting systems. This was a common criticism of the LACI requirement. In December 2001, the Bank responded by making its guidelines for Project Financial Management more flexible and dropped the requirement of a standardized, fully integrated project management system. Given the downsides of the fully integrated project system and its implementation difficulties, the project partners decided not to implement the developed system in all project states.

<sup>7</sup> Some of the institutions may be eligible for support on a proposed second project of the Technical/Engineering Education Quality Improvement project (TEQIP II). However, this potential second

31. ***Maintenance, training for maintenance, and spares of equipment and laboratories are found to be satisfactory.*** A second utilization study from May 2007 relying on site-visits to all polytechnics concluded that: (i) consumables, spares and operational manuals are available and in proper and regular use, except in very few cases, (ii) training of staff in maintenance has occurred in most cases, (iii) in-house capacity for maintenance exist in the majority of cases for vehicles and for some equipment, while other major equipment is still covered by manufacturers' guarantee. Most buildings and equipment are new thus requiring minimum maintenance. Nevertheless, there exists room for improvement through annual maintenance contracts for major equipment, and in long term maintenance either through establishment of an effective oversight mechanism of maintenance by public work departments or a formal contract for maintenance to a contractor.

32. The sustainability of reforms, institutional capacity, and financing of the polytechnics is further discussed in Section 4 on risk to development outcomes.

### **3. Assessment of Outcomes**

#### **3.1 Relevance of Objectives, Design and Implementation**

33. ***The project is highly relevant for following five reasons:***

- The objective of support to the less economically developed states with full ownership to supported project was and still is appropriate. The federal government and the selected states had a strong ownership of the project as aimed for in the Bank's CAS for FY 1998-2000. Further, the importance of equal distribution of the fruits of economic growth was emphasized during the time of project implementation. This project focused exclusively on assistance to less economically developed and remote states/UT of India. This is equally consistent with the India CAS approved in 2004.
- The focus on inclusion of disadvantaged groups of society is highly appropriate given their low participation in technician education. Inclusion remained a strategic priority in the three CAS' covering the project's duration, the two federal government's plan for technical education (9<sup>th</sup> and 10<sup>th</sup> five-year plan) and the Bank's sector plan for technical and vocational training. The 11<sup>th</sup> five year plan and the government in power at the time of writing (2007) emphasizes inclusive growth where inclusion of disadvantaged groups in the education system is key to a more equal distribution of the benefits of India's rapid growth.
- Increasing access to quality technician education is relevant for the Indian economy. First, the education sector remained a priority sector for Bank assistance during the years of the project. Second, recent economic growth is driven by service sectors, including the IT sector, and manufacturing. Lack of skilled technicians is becoming a bottleneck for continued high growth in both sectors. For example, the industry association for software and services, NASSCOM, estimates that India will lack 500,000 engineers by 2010, (NASSCOM 2005). The project preceded and accommodated this surge in demand for technically skilled labor.
- The design included both policy reform and investments. A large share of the loan proceeds financed construction and equipment (64 percent) for public institutions. These

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project is expected to support creation of post-graduate programs, which few of the Polytechnics have the academic capacity to introduce. All projects states have been informed about this option and limitation.



“hardware” purchases were combined with policy changes, such as decentralization of decision making through increased autonomy, curriculum reform, training, and revenue generation/cost-sharing. Further, the project included actions to ensure teaching was aligned with private sector demand. The public intervention is justified by the need to promote equity in provision of educational opportunities. The design was in line with both the Bank’s sector study for India undertaken jointly with project preparations, and the Bank’s education strategy, World Bank (1999).<sup>8</sup>

- The project design and implementations focus on sharing expertise through networking institutions and sharing experience across states through joint review missions. networking with excellent polytechnics to adopt best teaching practices, assist in helping in industrial training, curriculum reform and facility interviews for graduates. For instance, the two Polytechnics in Mizoram were twinned with S.B.M. Polytechnic in Mumbai, which was a well-performing institution under the first Tech. Ed. project. Similarly, Sikkim twinned with Nettur Technical Training Foundation (NTTF), a non-governmental organization from Bangalore. Given the large experience in India, this cross-fertilization of experiences is considered good practice.

### **3.2 Achievement of Project Development Objectives**

34. *The project more than fully achieved its objective.* It assisted the Government of India and State governments in expanding enrolment by 388 percent, improving quality (83 percent of graduates are either employed or accepted in further education) and raising efficiency (utilization rate of seats increased from 58 percent to 84 percent). Further, the project increased access to disadvantaged sections of society. Intake of both women and SC/ST students increased five-fold in absolute numbers. Achievements exceeded expectations in three key areas: first, three additional and new institutions were created reaching further remote and under-served areas. Second, improvements in quality were externally certified through accreditation and ISO-9000 certification. Finally, these improvements were achieved while lowering annual recurrent per student costs by 35 percent in real terms.

35. This section will first examine the project’s achievement of the PDO as measured by the outcome indicators specified in the PAD. Second, it summarizes the achievements of the outputs as gauged by the PAD targets. Lastly, it discusses the link between output and outcome.

#### **A. Impact and Outcomes**

36. The project succeeded in systematically reforming technician (polytechnic) education in the supported states/UT. This reform consisted of six elements:

- (i) Increased capacity and enrollment, in particular for women, SC/STs and rural students. Student intake capacity increased from 3,630 at the baseline to 9,133 (252 percent, and 122

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<sup>8</sup> The QAG review in 2001 criticized the project design for not bringing in private providers of education, since this was one element of the Bank education strategy. At project end, none of the states/UT has private providers of diploma technician education. With sufficient, credible, and long term subsidies, private providers could potentially have been incentivized to enter a build and operate contract for provision of technician education. However, it is uncertain whether long term outcomes would have improved, since: (i) private-aided schools in India have been shown to perform on average similarly to public schools, (ii) proper public oversight would remain important for outcomes, (iii) private providers would have to be compensated for the risk of sunk costs, should demand for technical education not be forthcoming or public subsidies were to be ceased, and (iv) the remoteness and risk of unemployment of graduates could have deterred private investments.

percent achievement of target). Enrolment increased from 1,623 pre-project to 7,919 in 2006/07 (507 percent and 102 percent achievement).<sup>9</sup> Enrolment of women increased from 487 to 3,038 (625 percent). Women made up 38 percent of the student body in 2006/07 as compared to 30 percent in 2000/01. A 28 percent improvement (8 percentage points). The share of women enrolment in the project states/UT is close to double that of the national level, 22 percent. However, the improvement was lower than the ambitious target of 47.6 percent (81 percent achievement). As discussed later, there were several initiatives to further strengthen intake of women students. 3,482 SC and ST students received technical education in 2006/07 compared to an estimated 723 in 2000/01 (482 percent). On average SC/ST students made up 59 percent of the student body in 2006/07, which was the targeted share in the PAD (100 percent achievement). The number of students from rural areas increased from 626 to 4,605 (736 percent). Rural student now make up exactly two thirds of the student body which exceeds the target share of 58 percent (115 percent achievement).

- (ii) Improved quality and branding of technical education. Objective measurement of quality of education is difficult. Best available indicators are employment rate of graduates (see below) and external certification. Programs at two institutions were accredited during the project. Accreditation certifies that these institutions comply with national academic norms, monitors factors important for quality, and possess capacity to self-evaluate. Importantly, these certifications imply a commitment to periodically assess quality and obtain feedback from internal and external stakeholders. This fosters continual change and sustainable quality. Nine obtained ISO-9000 certification through the establishment of documentation of all key processes, and establishment of monitoring, evaluation and feedback mechanisms. Only two were certified prior to the project. Further, state officials and principals rank increased awareness and demand for technical education as the most important impact of the project (Annex 5).
- (iii) More autonomous and empowered institutions. States/UT have granted increased autonomy to polytechnics as envisioned at approval. Full academic and managerial autonomy has been decentralized to the institutional level in six states. Limited financial and administrative autonomy is provided to most polytechnics. Two states awarded full autonomy to the polytechnics through the creation of societies. Although, decentralization is difficult to quantify, it is estimated that the autonomy objective was achieved by 125 percent. The autonomy enables the institutions to independently make financial, managerial, administrative, and academic decisions to respond to local market needs, innovate and achieve efficiencies. Public oversight and regulation was moved closer to the institutions. For example, Sikkim established a State Board of Technical Education. The polytechnics in Tripura de-affiliated from the West Bengal Board of Technical Education and affiliated to Tripura University. Besides signaling higher state capacity in oversight, these changes give greater academic flexibility to respond to state specific economic and social needs.
- (iv) The institutions increased responsiveness to demand and linkages with local industry. Seven out of ten of the graduates from the 05/06 batch of students found employment. The PAD target was 65 percent (104 percent achievement). Taking into account the proportion of graduates that continued their studies at a higher level (mostly engineer studies) the

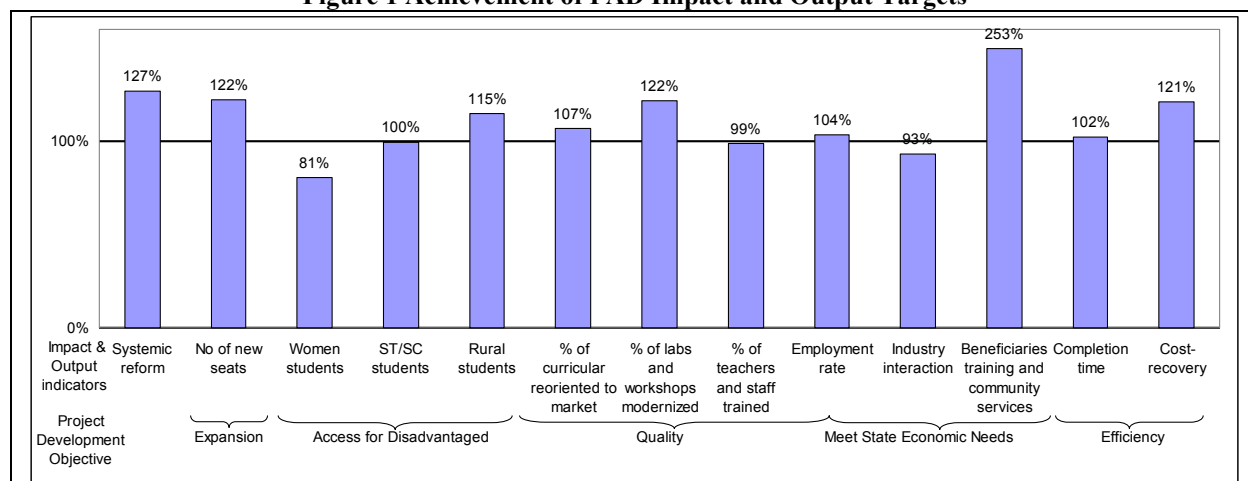
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<sup>9</sup> Ten of the 60 new education programs initiated under the project started in 2004/05. Therefore, there were no third year students in those programs in 2006/07. The polytechnics had capacity ready to accommodate these students in 2007/08. Adjusting for this time lag in the student population, the enrolment would increase to 107 percent of the target.

employment rate achieved was 83 percent, which correspond to a 127 percent achievement of the target. Number of students interacting with industry increased by 1,571 percent over the baseline.<sup>10</sup> The interaction increased employability of graduates and probably also raised motivation and learning outcomes of students.

- (v) Higher efficiency. Capacity utilization increased dramatically. From using 58 percent of the authorized seats pre-project, 83 percent of seats were filled by the end of the project, despite the large increase in admission capacity. Annual per student costs decreased in real terms by 35 percent. On average, students completed the diploma course in 3.3 years compared to the PAD target of 3.4 years (102 percent achievement).
- (vi) Higher financial sustainability through cost-recovery. Cost recovery increased to Rs. 10.5 million during the life of the project (121 percent achievement). This represents 9 percent of total revenue expenditure. Student fees increased by a factor of six in nominal terms, and revenue from sales of service and products doubled.
- (vii) Increased response to specific state economic needs. Although it is early to measure, the available indicators suggest that the changes and investments resulted in an education that better meets the states' economic needs: (i) institutions were better empowered to respond to local needs, (ii) placement rates increased, (iii) sale of services to industry increased, (iv) most new programs were over-subscribed, (v) local and national industries have started recruiting at the polytechnics, and (vi) built advanced human capital and specific capacity to respond to natural catastrophes. Over time, the increased availability of skilled technician labor is likely to contribute to private investment.

**Figure 1 Achievement of PAD Impact and Output Targets**

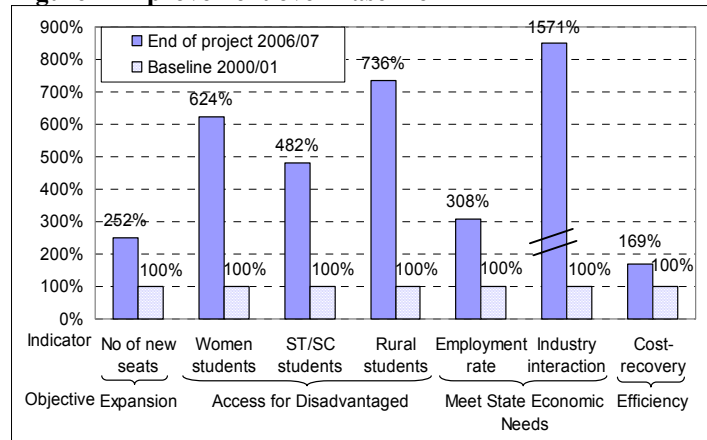


Note: Enrolment of women students increased 525 percent during the lifetime of the project. The female student population now makes up 38 percent of the student population in project states/UT, which compares to 22 percent at the national level.

<sup>10</sup> Students benefited from increased interaction with industry through lectures from industry, training in industry, visits to firms, campus interviews with firms, and student participation in industry projects. Very few students out of a small student population benefited from industry interaction at project start. This made a dramatic increase in industry interaction possible. The increase is calculated for the states where baseline data on industry interaction were available at project initiation. Nothing indicates that a similar improvement did not occur in states without baseline data. The reported averages are calculated as the sum of the state outcomes when appropriate and as the un-weighted averages across states for the remaining indicators. See Annex 2 for details.

37. **The outcomes represent a significant improvement over baseline.** Figure 2 presents the outcome and impact indicators as a percentage over the baseline value for the indicators where a non-zero baseline was established. In brief, the project helped states/UT and institutions significantly enhance technician education over the duration of the project. **On average, most project states exceeded their targets** (details in Annex 2).

**Figure 2 Improvement over Baseline**



## **B. Outputs**

38. **Component 1 succeeded in capacity development and expansion.** On average, targets for capacity and expansion were exceeded substantially (135 percent). This component accounted for 60 percent of the total. Nine new polytechnics as against the project target of six were established. They have all been in operation for two years. Capacity of another 12 existing polytechnics has been substantially enhanced. Sixty diploma programs and post-diploma programs were established. The goal was 52 new programs (115 percent achievement).<sup>11</sup> As mentioned, student intake capacity increased by 5,503 places (122 percent achievement) from 3,630 at baseline to 9,133. Enrolment increased from 1,623 pre-project to 7,919 (488 percent). Number of hostel seats for boys increased by 1,065 (84 percent achievement) from 900 at the baseline to 1,965. More hostel seats were created for girls, 1,252 (100 percent achievement). Significant increase in faculty and staff residences was also achieved. The training, continuing education and community programs substantially exceeded their aims (210 and 253 percent). The increased emphasis on training and establishment of 19 additional Skills Development centers decided at mid-term, where US\$ 8.9 million of unallocated loan proceeds were added to training and community programs, contributed to this achievement.

39. **Component 2 achieved the envisioned support of Quality of technician education.** On average, goals were exceeded by 5 percent. The component financed inputs that aimed at a quality improvement through: (a) modernization of 143 existing laboratories (113 percent achievement) and establishment of 221 new laboratories (131 percent achievement); (b) The curricula of all programs were revised according to labor market needs (100 percent achievement) and 58 new curricula were developed (114 percent achievement). Revisions centered on advances in technology, learning through experimentation, and self-learning through information-search used for assignments. Further the revisions introduced curricula with multi-point entry and credit systems in 80 programs (91 percent achievement) to make the programs more flexible. However, the polytechnics have still to take advantage of the multi-point entry system, in the sense that only in very few cases are the competences of entering students assessed and admitted at other levels than semester 1; (c) Interaction with industry increased greatly through student attachment in

<sup>11</sup> In Sikkim, the plan of introducing six post-diploma programs was modified to introduce four additional diploma programs due to low demand for post-diploma programs.

industry, industrial visits, industry expert lectures, campus lectures, and participation in industry projects. Further capacity to interact with industry was strengthened and institutionalized through establishment of Industry-interaction cells in each Polytechnic, and (d) training of 560 faculty members (102 percent achievement), while training of other staff reached a 96 percent achievement. Despite high demand and several planned events, only one foreign training tour was realized. The approval process of foreign tours—needing high level State and Government of India approval—seems too cumbersome. The lack of study and training tours leads to sub-optimal transfer of global best practice to and from India.

40. ***Filling the teaching positions required a substantial effort.*** The project succeeded in filling on average 89 percent of sanctioned positions across states (98 percent achievement). However, 130 positions are still vacant due to unavailability of qualified teachers. This risk was identified in the PAD. The mitigating action of inviting guest lectures was effective, but not fully sufficient to address the shortage of faculty. The risk was exacerbated during the project, because of the surge in demand for technical professionals at the master and PhD level in the Indian labor market due a major expansion of private engineering education, and the healthy economic growth during the life time of the project. Further, the polytechnics faced difficulties in attracting qualified teachers due to the perceived remoteness of the participating states/UT. Almost 100 of the available vacancies are in Jammu & Kashmir. A national initiative for development of faculty is necessary to relieve the shortage of qualified teachers.<sup>12</sup>

41. ***Component 3 accomplished the targeted efficiency improvements.*** On average, the efficiency targets were met (101 percent achievement of the efficiency targets for component 3, which does not include the per-student costs discussed in the economic analysis). This paragraph summarizes the achievement of the approved efficiency targets, while the following economic analysis examines efficiency beyond the targets in particular per student costs. As a result of higher quality of teaching, equipment, and management, internal efficiency increased as measured by: (i) student drop out, which was reduced by 33 percent on average from 6 percent to 4 percent (79 percent achievement), and (ii) average time to complete the diploma, which reached 3.3 years (102 percent achievement). As discussed above, the project States/UT progressed significantly on the granting of autonomy to the institutions (125 percent achievement). The polytechnics and states adopted policies for sharing of Internal Revenue Generation (IRG), which in most instances now are fully retained by the institution. Thus giving a strong incentive for sale of services. In combination with change culture and new equipment, IRG increased to Rs.105.9 million during the project life (121 percent achievement). It now represents 8 percent of total budget on average with large variations across states.

### **C. Causality between project outputs and impact**

42. ***It seems highly likely that project inputs and policies supported in the components led to the significant improvements in technical education, and that the improvements would not have occurred in the absence of the project.*** As is always the case, it is difficult to prove causality from project activities to state level outcomes on a large scale for non-randomized interventions. Nevertheless, there were no major external factors during the project, such as major industrial projects or a demographic bulb that could credibly explain the major outcomes (increased capacity utilization from 58 percent to 84 percent, increased employment rate reaching

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<sup>12</sup> A working group under AICTE estimated that the national shortage of faculty (teachers, assistance professors, and professors in technical and engineering education) will reach 230,000 in 2011, (AICTE, 2005).

83 percent, or increased internal revenue generation) that took place across the eight participating states/UT. Further for this project, the outputs are closely tied to the impacts. For example, financed activities such as job interviews on campus and industry training of students and faculty are closely linked with the measured impact: employment. Annex 2 compares the evolution of the key performance indicators between project states, comparable North-Eastern states that did not participate in the project (Manipur and Assam) and the national level. Only in project states did polytechnic education improve significantly in India since 2002. Comparable North-Eastern state that did not participate in the project did neither increase enrolment, nor increase enrolment of women and SC/STs. For example, the share of women students increased from 27 percent in 2002 to 38 percent in 2007 in project states. This compared to: (i) an increase in female enrolment in the two comparable North Eastern states from 17 percent in 2002 to 18 percent in 2005, most recent available data, and (ii) an increase at the national level from 20 percent in 2002 to 22 percent in 2005. Similarly, overall enrolment of technician education increased by 255 percent in project states, while it only increased 2 percent in comparable North-Eastern states, and declined 9 percent at the national level.

### 3.3 Efficiency

43. ***The project assisted the 21 supported Polytechnics in substantially improving efficiency.*** Annual recurrent cost per student was reduced by 35 percent in real terms. This was primarily realized through an increase in the seat utilization rate from 58 percent to 84 percent. Internal efficiency was further improved by an improvement in repetition rate, although smaller improvement than targeted. External efficiency was equally enhanced. Employment rates reached an average of 83 percent (excluding students that continue to further studies). Due to insufficient information regarding the methodology and assumptions of the cost-benefit analysis in the PAD, this report could not update the cost-benefit analysis. It is essential that assumptions and methodology are explicitly stated in the economic annex of the PAD. The average salary of a graduate from class of 2005/06 amount to 83 percent of the salary level that would have made the project have a 10 percent rate of return, according to the original cost-benefit estimation. However, this pre-project calculation does not take into account the higher employment rate or the 35 percent reduction in annual student cost. A new cost-benefit (internal rate of return) estimation was thus undertaken. It finds that the project's internal rate of return varies from 22 percent to 26 percent depending upon the future lifetime unemployment rate for the supported beneficiaries (5 percent to 15 percent).

44. ***A detailed report on Utilization of procured civil work (space), equipment, learning resources and other goods found that the financed items were in almost all cases fully installed and satisfactorily put to use.*** The report relied upon site visits to all institutions and SPIUs. It found space utilization of classrooms, laboratories, drawing halls, computer centers, and workshops to be adequate, satisfactorily utilized, and as per planned requirements. Hostels, faculty and staff residence are well utilized. The utilization of equipment is generally satisfactory. This is particularly the case for Sikkim, Arunachal Pradesh and Sikkim. Nevertheless, Mizoram and Tripura could increase the use of large equipment. In most cases, consumables, operation manuals and essential spares are available. Learning resources are adequate, consistent with national norms, maintained well, and usage is high. The report recommends an even further integration of laboratory, workshops and library resources in the learning process to increase work-based learning. The report also followed upon detailed recommendations at the state level from a similar utilization study. It concludes that the states took actions on most suggestions.

### 3.4 Justification of Overall Outcome Rating

**Rating: Highly Satisfactory**

45. *The rating is justified by the projects being highly relevant, its achievement of all outcomes, the over-achievement of main key outcomes, and doing it in an efficient manner in all states.* The only drawback was the insufficient adherence to the Bank guidelines for local procurement in some states.

**Table 1 Justification of Overall Outcome Rating**

Objective	Relevance	Achievement of outcomes (efficacy)	Efficiency	Outcome
1. Expansion	High	Over-achieved	Substantial	Highly Satisfactory
2. Improve Quality	High	Over-achieved		
3. Improve Efficiency	High	Over-achieved		
4. Meet State Economic Needs (relevance)	High	Achieved		
5. Increasing access to disadvantaged sections of society (equity)	High	Achieved		

46. *Further, it should be noted that these states are economically and industrially under-developed states compared to the national average.* Often such states face greater difficulties in achieving project targets due to lower capacity, limited experience, and greater geographical distance. Almost none of the participating states had the required expertise and capacity to design and construct the civil works envisaged under the project. Further, the revision of curricula and focus on industry and soft skills training were new to the states. The strategy of twining: (i) state implementers with experienced external consultants, and (ii) polytechnics with recognized national institutions combined with the sharing of experiences through the Joint Review Mission worked highly satisfactorily.

### 3.5 Overarching Themes, Other Outcomes and Impacts

#### (a) Poverty Impacts, Gender Aspects, and Social Development

47. *Poverty of the beneficiaries and their families and local economies were diminished as a consequence of the project.* Since poverty impact is an over-arching theme, not directly aimed at in the PDO, there is no formal impact study on poverty. The principal impact on poverty is the increased earning power and employment of the graduates. During the six years of the project, 16,000 full-time students benefited from the improvements in technical education (the later batches of students enjoyed higher quality of infrastructure, better trained faculty, redesigned curricula, and better linkages with industry. Using the 2006-outcomes, over 75% of students would find employment within one year of graduation with an average salary of Rupees 4,000 per month. This salary level is substantially above the national poverty line.<sup>13</sup> Prior to the project, a

<sup>13</sup> National Poverty Lines: Rs. 370 per capita per month for rural area and Rs. 561 per capita per month for urban areas in 2005-06 prices.

substantially smaller share of graduates found meaningful employment. We assume that between 20% (the poverty level of the least poverty affected participating state/UT) and 40% (the poverty level of the most poverty-affected participating state/UT)<sup>14</sup>, of the student population came from poor families. These assumptions on poverty prior to enrolment and the above labor market data from 2006, implies in an admittedly simple back-of-the-envelope calculation that, at least between 5% and 18% escaped poverty as a consequence of the project. Further, the supported polytechnics are strongly expected to continue educating youth in the same manner, thus multiplying the above impact on poverty in the next 15 to 20 years. A large number of the immediate dependents of the graduates would equally exit poverty. In addition, the project assisted 18,032 members of the local community through the community programs and 5,143 through continuing education and training programs. Some of these beneficiaries are also likely to have escaped poverty. Lastly, the project would have an indirect, but possibly important, impact on increased productivity of companies in the local economy leading to higher job-creation.

48. ***Women in the supported states benefited from a 525 percent increase in access to technician education.*** The number of female students surged from 487 in 2001 to 3,038 in 2005/06 (528 percent increase). In Jammu & Kashmir, where women have traditionally had fewer educational opportunities, enrollment increased ten-fold from 122 to 1358. Despite these improvements, the achieved share of enrolment, 38.4 percent, fell short of the ambitious target of 47.6 percent. Nevertheless, the achieved female share of enrolment is considerably above the outcome achieved in the two earlier Technician Education projects in India (30 percent and 28 percent for Tech. Ed. I and II, respectively). Further, it compares favorably to 11 percent, 23 percent, and 22 percent in Assam, Manipur, and the national average, respectively. Not surprisingly, the increased enrolment comes from establishment of one Women Polytechnics, expansion and improvements of three Women Polytechnics, construction of hostel facilities for women (1,252 new seats), new programs with a traditional higher share of females (garment technology, cosmetology, interior design, food processing, medical lab technology, electronics, and computer science), tuition discounts for women, and targeted promotion. External factors such as the general increase in women in the labor market and reduced perception of technical education as male-dominated, have also contributed to the increased enrolment. The ICR recommends that the special initiatives for female enrolment continue, and that leadership is further nurtured among female teachers in order to raise the number of female principals over time, in particular in Women Polytechnics. Further, women made up a large share of the 9,600 beneficiaries of community and continuing education programs. One concrete such example from Andaman and Nicobar Islands is presented in Annex 10.

49. ***The project contributed to a more equitable distribution of educational opportunities in remote areas.*** Seven of the nine new polytechnics were the first post-secondary education institutions in their district, for example, the construction of polytechnics in remote districts, such as in Leh, Kargil, and Eastern Sikkim. In addition, more remote islands were served by six polytechnic extension centers. Increased public service has been shown to decrease social tension and discontent.

#### **(b) Institutional Change/Strengthening**

50. ***Institutional change was the fundamental underlying objective of this project, and most polytechnics strongly developed their longer-term capacity and service to society.*** The project implemented a three-pronged strategy to build longer-term capacity in the institutions. First, the polytechnics were awarded greater autonomy and institutional boards were established

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<sup>14</sup> Not including Jammu & Kashmir which had less than 5% poverty ratio in 1999-2000.



with the dual purpose of giving voice to more stakeholders at the board of the institutions, and reduce the day-to-day governmental interference from high level government. In addition, several institutions de-filiated from distant over-viewing bodies and affiliated to more local over-viewing bodies. The case of Tripura and Andaman & Nicobar Islands were mentioned in Section 3.2. These policies created space for the institutions to become a driving force in local community. Second, a series of capacity building activities sought to nurture the states, institutions and their leaders to take advantage of this increased space. These activities included workshops on strategic planning, financial planning, and institutionalized mechanisms for feedback from stakeholders (students, graduates, and employers), and training of administrative staff, faculty and principals. Of particular importance seems to be the frequent interaction of principals, state officials, and faculty with outside institutions assisting and edging them to improve performance. These interactions include visit from and to networking institutions, peer learning among the participating states and institutions, the Joint Review Missions with the Bank and NPIU teams, and the academic consultants. Thirdly, the project provided the necessary investments to improve quality and carry out the planned activities.

51. ***Certain institutions and states better seized the opportunities brought by increased autonomy, capacity building activities and investment funds.*** Longer term capacity is approximated by ability to meet the targets, absolute performance, and external certification of quality and relevance. This is equally confirmed by timelines of implementation, quality of state ICR, and contributions to best practice identified during the Joint Review Missions. Determining factors seem to be: (i) political and personal commitment to technician education, and (ii) leadership and team work within the state and institutions.

**(c) Other Unintended Outcomes and Impacts (positive or negative)**

52. ***The assisted institutions developed an ability and pro-activeness in responding to major emergencies such as the Tsunami in the Indian Ocean; land slides in Nagaland; and snow storms and floods in Jammu & Kashmir.*** During Project implementation Jammu & Kashmir experienced natural calamities like excessive snowfall during February 2005, Earthquake in October 2005, floods in the valley during September 2006 resulting in loss of life and property. These calamities created tremendous human sorrow and material damage. In the case of the Tsunami, it diverted focus from project implementation to relief efforts for about eight months. More importantly, the polytechnics stepped up to the challenge and forcefully responded using their increased capacity and project equipment in the Tsunami relief efforts (Box 1).

**Box 1 The Vital Role of the Dr. B.R. Ambedkar Govt. Polytechnic in Tsunami Relief Efforts**

On December 26, 2004, the Sumatra-Andaman earthquake with a record magnitude of 9.0 triggered a gigantic tsunami. Waves up to 15 meters hit the Andaman & Nicobar Islands. The A&N Govt. Polytechnics and their six extension centers supported by Technician Education III played a vital role in the relief and rescue efforts. In particular, the Polytechnic undertook the following actions:

- (i) *Students and Faculty established a Disaster Relief Management System.* The system captured and disseminated photographs and information of more than 40,000 tsunami victims. Students and faculty surveyed more than 185 tsunami relief camps to collect names and information of orphans, deceased, and other victims. The information was crucial in informing families and in effectively distributing relief to those most affected by the tsunami.
- (ii) *The Institution's video conferencing system was the only functioning communication to the Southern Group of Islands that was most effected.* Six months prior to the Tsunami, V-SAT facilities at six extension centers of polytechnics in the A&N Islands were installed to provide distance education. Despite being affected by the tsunami, communication was re-established within 24 hours and served as a vital channel for assessing human loss, material damages, linking family members of more than 2,000 families, communicating relief needs, and coordinating emergency relief.

- (iii) *Students in Hotel management prepared food for more than a month for two Tsunami relief camps.* Using the institution's training facilities, the polytechnic delivered lunch and dinner to more than 250 victims of the tsunami (at the cost of the institution).

According to the institution, the key enabling factors in understanding the institution's rapid and effective response were the industry training of its students and faculty combined with its "may-I-help-you attitude?" This preparedness had trained them to use the up-to-date equipment and ICT infrastructure, their technical knowledge, and ability to work as a team to meet the catastrophically urgent need of the Islands.

The example shows that long term policies, such as increased autonomy, that empower the institutions and build genuine institutional capacity and responsiveness to specific state needs is faster and often more effective than most other relief efforts. Further, long term investment in up-to-date ICT equipment and on-site ability to immediately put the technology to effective use in relief work is necessary.

### **3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops**

53. Two surveys were carried out to gain insight into the design, implementation, and impact of the project. One set of surveys focused on retrieving feedback on the impact from the main beneficiaries of the project. Another survey undertaken by the ICR team sought feedback from federal and state government officials described in Section 5.

54. *The Impact Study carried out by four NITTTRs (National Institutes of Technical Teachers' Training and Research) surveyed beneficiaries from all eight states/UT.* The responses from graduates, final students and faculty are consistent and suggest: (i) Strong utilization and satisfaction with new equipment, laboratories, and learning material, (ii) curriculum, syllabus, course schedule are adhered to, (iii) quality, knowledge and effectiveness of teachers, laboratory staff, and teaching are adequate and satisfactory, (iv) Relation to industry (interviews, industry involvement in teaching etc) is good, but requires efforts and can become better, and (v) teaching became more student-focused with active participation of students, either in lab work or through project based teaching. Nevertheless, students still feel that teaching could use more project-based teaching related to real-life work situations, and employ more learning resources and ICT in the teaching.

55. *Surveyed employers recognized an improvement of skills.* Employers opinions are summarized as follows: (i) Employers generally rate the graduates as possessing adequate technical knowledge, good to excellent competencies in handling equipment and machinery, (ii) very satisfied with personal/soft skills, including communication, punctuality, team work, ability and willingness to learn, and management skills, and (iii) employers suggest to further incorporate project related teaching and field exposure.

## **4. Assessment of Risk to Development Outcome**

**Rating: moderate**

56. *This risk to development outcomes is moderate.* The project has built a conducive policy framework, longer term capacity and the necessary infrastructure for the polytechnics to maintain excellent quality and relevance of technician education. Nevertheless, state governments must maintain adequate funding, respect institutional autonomy, and demand accountability from each institution. Most importantly, institutional excellence must be pursued actively and constantly by the boards, principals and faculty of the institutions. This will continue to require substantial efforts from a visionary and dedicated leadership of each polytechnic and the state and federal government. The risk rate of moderate reflects that this institutional capacity and state government oversight may gradually diminish over the next five to ten years. The overall assessment of the individual risks and mitigating actions presented in the table below.

**Table 2 Risk to Development Outcomes: factors and mitigating actions**

<b>Development Outcome</b>	<b>Risk</b>	<b>Potential causing factors</b>	<b>Mitigating action / critical actions</b>
<b>Increased capacity</b>	Part of buildings and equipment lie idle: <b>Low risk</b>	<ul style="list-style-type: none"> <li>• No maintenance or spares</li> <li>• Insufficient No. of teachers due to either lack of budget or teacher shortage</li> <li>• Low demand from youth for technician education</li> </ul>	<ul style="list-style-type: none"> <li>• Spares and guarantees were part of purchase contract</li> <li>• States have budgeted for an adequate no. of teachers and teachers are available (but not always high quality)</li> <li>• With quality, demand from students is forthcoming</li> </ul>
<b>Improved Quality</b>	1) Reversal in use of current equipment, practices, and curricula: <b>Low</b> 2) Gradual decline in quality due to failure to continue improvements and updates: <b>Moderate (in medium term)</b>	<ul style="list-style-type: none"> <li>• Lack of funds or demand (above causing factors)</li> <li>• No update of curriculum or program offering</li> <li>• Decline in training of teachers</li> <li>• No replacement of equipment</li> <li>• Decline in industry training of students</li> <li>• No systematic feedback from industry and students</li> <li>• Insufficient use of learning resources</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional drive and capacity (continue with strategic planning and elicit feedback from users)</li> <li>• Mission to reach out to society (ISO certification and accreditation)</li> <li>• Pressure from outside board to continuously improve (boards established as part of the project)</li> <li>• Funds from budget to replace equipment and train (the increase in internal revenue generation mitigates)</li> <li>• Accountability demands from govt. through its boards for technical education (strengthened in project)</li> </ul>
<b>Increased Efficiency</b>	Decline in utilization rate: <b>Moderate (in medium term)</b>  Decrease in employment rate: <b>Moderate (in medium term)</b>	<ul style="list-style-type: none"> <li>• Maintain quality and capacity (above risks)</li> <li>• Decline in placement activities</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional drive and capacity</li> <li>• Mission to reach out to society (ISO certification and accreditation)</li> <li>• Pressure from outside board to continuously improve (boards established as part of the project)</li> <li>• Accountability demands from govt. through its boards of technical education</li> </ul>
<b>Increased opportunities for Women and SC/STs</b>	Decline in enrolment among women: <b>Moderate</b>  Decline in enrolment among SC/STs: <b>Low</b>	<ul style="list-style-type: none"> <li>• Reduced intake into programs with traditional high female enrolment and conversion of female hostels</li> <li>• Reduce efforts into targeted marketing campaigns and tuition discount for these groups</li> </ul>	<ul style="list-style-type: none"> <li>• Focus from policymakers</li> <li>• Institutional commitment to inclusive education (as promoted in the project)</li> </ul>
<b>Overall</b>	<b>Moderate</b>		

57. *The financed improvements and immediate gains achieved during project are likely to be sustained.* This concerns use of equipment and updated curriculum, inclusion of soft skills in teaching, links with existing companies, and trained teachers. The principal risk is insufficient funding for continued investments. Responses to the survey of principals and government officials involved in the project signal confirm this assessment. On a scale from 1 (high risk) to

10 (low risk), inadequate public funding is rated 6.9; hence, a medium to low risk. Similarly, the sustainability of the increase in IRG is rated the second highest risk (7.1). Hence, funding is expected to be tighter than before reflecting the real and hard budget constraints facing the state governments. It should be noted that the majority of leaders of education institutions in most countries claim this to be the biggest risk to educational outcomes. In this case, the State governments have—with the help of transfers from the Union Government—budgeted allocations to run the expanded polytechnics. Hence, funding of teachers and learning resources are forthcoming. Further three states/UT (Sikkim, Tripura, and Andaman & Nicobar Islands) have asked the polytechnics to teach degree level programs (one level higher than the traditional diploma level), which signals a sustained government commitment to the institutions. Another mitigating factor is the institutions' increase in IRG. These funds present an alternative source of revenue averaging 8 percent of total revenue (46 percent in the case of Sikkim), and are in almost all cases fully managed by the polytechnics themselves.

58. ***To maintain infrastructure and equipment up-to-date will in the medium to long run require new investments.*** It is recommended that each institution establish a depreciation/renewal fund that each institution manages in order to smooth out the costs of major equipment, major maintenance jobs, and new infrastructure. Hence, annual state budget should include an adequate share for future equipment and infrastructure replacements that are managed autonomously by each institution. Obviously these accounts should be audited to avoid misuse. Such accounts are currently being implemented for institutions participation in the TEQIP project.

59. ***The risk of a gradual decline in relevance of education due to changing labor market demands is moderate in the medium term.*** In the coming decade, existing skills and knowledge needs will change, and entirely new demands for skill will emerge. The polytechnics should respond with innovations to course-offering, curriculum, and link to new firms and economic sectors. This requires the institutions to continue being dynamic and outward looking. Based on other Indian and international experience, the role of stakeholders, including government officials, to ensure a dynamic institution is critical. The established policies of external boards, feedback mechanisms from graduates, students, and firms, links with peer institutions, and external quality certifications will push for such change. In particular, renewal of ISO certification and accreditation will necessitate continue improvements and responsiveness to local economy. Another indicator of the States and institutions continued commitment to improvement is the introduction of post-diploma programs in the polytechnic facilities. Both Tripura, and Andaman & Nicobar Islands have introduced post-diploma course. This is an encouraging sign of ability to respond to needs through institutional change. Nevertheless, this risk to development outcome is deemed moderate in the medium run due to the risk of reduced attention from policymakers and Board of Governors to the outcome of the polytechnics.

60. ***A set of second generation reforms to strengthen autonomy and accountability is desirable to fortify the gains of the project.*** Respondents to the survey of principals and state officials identified the risk of governmental interference in the day-to-day administration of the institutions, which is equal to not respecting the institutions' right to autonomy. This risk includes hiring of principals and faculty for political motives. Such interventions risk derails gains from long term planning and leads to diminished institutional capacity. As government oversight increasingly focuses on technical aspects and the external boards of institutions become institutionalized, this risk should be reduced. State and government policies could be improved through so-called second generation reforms.<sup>15</sup> For example, federal policies could facilitate

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<sup>15</sup> Given the required time to implement reforms to grant autonomy and strengthen institutional capacity, such second generation reforms could not meaningfully have been included in the timeframe of this project.

appropriate government oversight through development of accountability mechanisms, enhanced collection and dissemination of institutional performance data allowing for benchmarking of all institutions (second generation reforms).

## 5. Assessment of Bank and Borrower Performance

### 5.1 Bank Performance

#### (a) Bank Performance in Ensuring Quality at Entry

Rating: Satisfactory

61. The Bank performance is rated satisfactory based on the quality at entry, consultations with stakeholders, tribal plan preparation, sought remedies to eliminate the shortcomings in earlier projects, and swiftness of preparation. These topics were discussed previously in this document.

#### (b) Quality of Supervision

Rating: Satisfactory

62. *Quality of Supervision was Satisfactory*, because the Bank team acted as an effective agent of change, was adequately composed, gave timely advice on procedures, and built capacity through out the supervision period.

63. *The review/supervision team was high level technical.* The team composed of recognized, high level experts in technical and engineering education. This provided the team with credibility towards state governments and principals in calling into question sub-standard policies. Although, some international expertise were brought-in as part of preparation and review, the Bank team could have included more expertise from abroad, which is often perceived to be one of the Bank's strengths. There was also a high team stability with no change in task team leader, which has been shown to be important in the Bank

**Table 3 Rating of the Bank Team**

Question	Rating this project	All India
10 Highly favorable; 1 Highly unfavorable		
The Bank worked efficiently	9.2	6.8
The Bank helped to strengthen institutional capacity	9.5	6.9
The Bank and partners in Government collaborated well together	9.1	6.6
Overall I liked work/interact with Bank Staff	9.5	7.2
The World Bank treated clients and stakeholders with respect	9.5	6.3
The Bank's procurement requirements made it difficult to work with the Bank (low is good)	5.1	5.2
The Bank played a useful role in reducing corruption, collusion and nepotism in this project	8.3	4.3
The Bank imposed reasonable conditions on its lending	9.3	5.7

Note: The survey received a moderate response rate of 59 percent (20 out of 36). The all India survey included a large share of media and stakeholders not directly involved in a World Bank project. This could reduce comparability of the two surveys.

Further, there were consistently input from social experts and a professional architect. As discussed earlier, Bank review of adherence to Bank procurement guidelines was insufficient. Also, inadequate involvement of the Financial Management function during project supervision weakened fiduciary oversight on the project. Overall supervision effort was not comprehensive to that extent. In an anonymous survey of government and school officials, Table 3, the team was rated favorably on its efficiency, ability to collaborate and interact in a courteous way with the clients. Compared to the average rating of the Bank in India, as surveyed in the 2004 client survey, the review team scored above the Bank average.

64. *The Bank team played the role of agent of change during review missions.* Together with NPIU, Bank team members developed best practice guidelines and templates on autonomy,

revenue sharing policies, student feedback mechanism, and other policy guidelines. These responded to knowledge needs and public goods in the project that facilitated implementation of the reforms. Also, the review missions introduced and promoted additional quality improvement, such as the ISO-9000 certification, accreditation, installation of language labs in polytechnics, and more soft skills in teaching. By using the Bank's role as a convener of the Joint Review Mission, the team facilitated peer learning, exchange of experiences, and cooperation across the project states. Lastly, the Bank team acted as an agent of change by setting a high standard for implementation and quality of technical education, which stimulated states to better performance.

65. ***The Team made monitoring and evaluation a cornerstone of the review mission.*** Further, the evaluations, impact study, and utilization studies to verify efficient and effective use of funds was best practice as well.

66. ***Finally, some team members were based in India, which increased interaction with the counterparts and lowered costs.*** Further, team members could visit problem states to advance implementation on an on-going basis. Project preparation costs only amounted to USD 134,000, which was the lowest preparation project cost for a Bank Human Development project in India during FY01-FY07. The average cost for the same period was USD 466,000 (current prices). The supervision of the project from FY01- FY07 cost on average USD 78,000 which was slightly below the average for a human development project in South Asia (USD 85,000).

### **(c) Justification of Rating for Overall Bank Performance**

Rating: Satisfactory

Both the Bank's performance in ensuring Quality at Entry and at Supervision were evaluated to be Satisfactory.

## **5.2 Borrower Performance**

### **(a) Government Performance**

Rating: Satisfactory

67. ***The performance of the federal government is rated satisfactory based on its continued support and oversight in project implementation.*** The Department of Higher Education in the Ministry of Human Resource Development (MHRD) was responsible for project implementation through the National Project Director. The project enjoyed strong support from MHRD which facilitated implementation. Further, the close link between MHRD and the Central Project Advisor (Head of NPIU) facilitated flow of information and linkages with the federal government. Nevertheless, a combination of slow approval of foreign travel for faculty, principals, and project officials, and low quality of proposed foreign training tours resulted in only two instance of foreign training. For other project, the government could consider delegating the authority for approval of overseas travel to the state level.

### **(b) Implementing Agency or Agencies Performance**

Rating: Satisfactory

68. ***The National Project Implementation Unit performed satisfactorily based on the highly satisfactorily outcome of the project, its facilitation of implementation, and quality of technical advice.*** The NPIU coordinated project implementation at the national level and guided States in their implementation. As such, the Unit and its staff merit credit for the strong outcomes of the project. In particular, the Unit's effort in assisting states with workshops, exhibits, and guidelines on implementation, courses, workshops on development of strategic planning, and Learning resources carried fruits. Further, dissemination to state through the NPIU website is also very good practice. In the survey of government officials, Annex 5, the NPIU scores high in overall

facilitation of implementation and in the quality of educational and academic advice. Nevertheless, there seems to be room for improvements in the “provision of timely and adequate advice, where the NPIU did not receive a rating as high as its other ratings. Further, there was room for improvement in the staffing of the NPIU, which suffered from a relatively high turnover of Central Project Advisors (head of NPIU), which, to a certain extent, hampered pace and continuity of project implementation.

69. ***The States governments are on average rated satisfactory.*** The State governments through state project implementation units (SPIU) were the implementing agencies of the project. Generally, the project supported remote states that are comparatively less economically developed, with little experience in foreign funded projects, and relatively lower implementation capacity. Despite these disadvantages, project implementation and outcomes were highly satisfactory. Compared to the two earlier Tech. Ed. projects, the staffing of the SPIUs and flow of funds were overall considerably more stable. The survey of government officials suggest that state government performed best in overall facilitation and approval of training and faculty and staff. On the other, the state could have accelerated the implementation of autonomy and IRG policies. A similar shortfall was noted in Tech. Ed. I and II projects. Further, adherence to autonomy and IRG policies equally receive a relatively low rating, suggesting state governments need to institutionalize and internalize the policies promoted by the project.

70. ***Performance varies across states.*** Annex 2 includes a table comparing the achievement of targets of key indicators by states/UT. All states/UT achieved or exceeded on average their targets. In particular, the polytechnics in Andaman & Nicobar Islands exceeded most targets (196 percent achievement of targets on average of the 13 key indicators). This was achieved primarily because of higher government commitment and institutional team and leadership. The A&N polytechnics stand out in its service to community and industry, its industry-involvement and its immediate responds to the Tsunami. However, other states excelled on individual areas. For example, Nagaland and Sikkim succeeded in raising employment rates to above 80 percent. Sikkim reached a cost-recovery ratio of close to 50 percent. Tripura raised enrolment rate of women student in technician education from 25 percent to 47 percent (second highest after Mizoram with 54 percent and highest achievement of target for women students, 118 percent). Jammu & Kashmir increased enrolment capacity by 2,894 students (158 percent achievement). However, state-specific shortcomings existed as well. Tripura did not succeed in raising revenue generation. Sikkim fell short of the enrolment target for women. Some of these shortcomings were due to overly ambitious targets. Other state-specific shortcomings are expected to be overcome in the next years of operation given the institutional arrangements and capacity put in place. The post-review of adherence to Bank procurement guidelines procurement in 2005/06 contracts found that A&N Islands and Mizoram had the lowest number of deviations from guidelines, while over half of the contracts reviewed in Arunachal Pradesh, Meghalaya, and Nagaland contained deviations. State governments should build upon the important gains of the project and address these state-specific shortcomings.

### **(c) Justification of Rating for Overall Borrower Performance**

#### **Rating: Satisfactory**

71. ***Both the performance of the Federal Government, NPIU, and the State Governments (Implementing Agencies) were rated satisfactory.***

## **6. Lessons Learned**

72. The project design, implementation and impact allow us to draw important lessons. Some lessons are new, but the majority confirms the high impact of consistent implementation of

already-identified best practice combined with new demanded skills. The lessons are divided into educational lessons and project implementation lessons.

#### **A. Educational lessons learned**

73. Impressive results with proven policies and inputs, consistency, focus on demanded skills (soft practical skills useful in Industry).

74. ***Quality and relevance of education drives demand for technical education and is necessary to increased efficiency.*** Quality improvements were necessary to not only increase demand for technical education, but also to increase employment rates and salaries of graduates. The increased demand led to a more than doubling of the capacity utilization, which together with the betterment of the labor market outcomes significantly increased efficiency of technician education. As such, quality of education can drive efficiency of education.

75. ***The project showed best practice on provision of learning and knowledge sharing opportunities.*** The Bank review missions were carried out jointly with all state teams present. This allowed for significant peer learning and peer pressure. The survey of state officials and principals found that sharing of experiences and learning best practices were almost as important objectives of the joint review mission as the guidance on procedures and rules for implementation. Three other learning opportunities were built into the project. First, networking with excellent polytechnics to adopt best teaching practices, assist in helping in industrial training, curriculum reform and facility interviews for graduates. Second, workshops and site visits from the NITTTRs. For example on utilization of infrastructure, curriculum development, and equipment. Third, workshops, templates and guidance from NPIU and Bank teams, such as on student feedback mechanisms and strategic institutional planning. These learning opportunities facilitated significant peer learning from the academic consultants, provided national recognition of stellar performance through an (informal) name and shame process, and dissemination of successful policies. Including such frequent interactions and networking in project designs and approach review missions as opportunity for peer learning among project participations could be best practice and should be used more in Bank project and supervision.

76. ***Low demand and prestige of technician education can be overcome.*** In many countries, including India, technician education are at time perceived to be the less alternative to academic, generalist secondary and tertiary education. This project succeeded in raising interest and prestige of technician education through its quality improvements and the related marketing campaign of the improvements. Such quality initiatives and the marketing of high placement rates can overcome a perceived low prestige of technician education.

77. ***The project successfully linked policy changes with investments and capacity building.*** Not only lack of funds hampers educational outcomes, in many countries policies provide few incentives to education institutions for improvements. Therefore, regulations need to change to augment returns on investments. This project strongly encouraged state governments to upfront increase institutional autonomy and provide guidelines for internal revenue generation. As such the project succeeded in combining a set of policy changes with a set of investments that jointly increased outcomes. However, some states did not award institutional autonomy in all dimensions to institutions as recommended. Future projects involving policy changes could consider including elements of performance based funding so as to maintain strong accountability mechanisms.

78. ***Soft skills are highly valuable and teachable.*** This was one of the first Bank projects that implemented courses focused on imparting soft skills. Most polytechnics offered coaching and classes in soft skills (team work, interview skills, presentation skills, communication etc.) As reported by both graduates and employers, the imparted soft skills were highly relevant to the



work place and increased graduates' chance of landing a well-paid job and thus lowering the risk of poverty.

79. ***There is an urgent need to increase availability of qualified faculty staffing in India.*** Through targeting recruiting and hiring of guest-teachers, the project practically achieved the target for faculty staffing (98 percent achieved). However, the pool of qualified teachers was very limited and the share of guest-teachers relatively high. Combined national data on vacancies of faculty position, this signals an urgent need for increased production of master and PhD graduates to fill the vacancies. Further, continued faculty development through further education and industry training is equally necessary.

80. ***Female enrolment in technician education can be increased significantly by targeted interventions.*** Some claim that it is difficult and expensive to counter the traditional bias against women in technical education. The project shows that targeted programs, such as creation of women polytechnics and suitable, demanded, careers, combined with marketing to young women and their families clearly can achieve a higher enrolment of females in technician education.

81. ***The importance of industry involvement in technical education cannot be over-emphasized.*** Industry involvement through student and faculty training in industry, firm visits, industry representatives at the board of the polytechnics, curriculum workshops, or advisory board, increased by 92 percent during the project. Through these channels, the supported polytechnics enhanced their technical training to include the practical skills and knowledge that closely reflect practices in the hiring industries. Together with the quality improvements, the increased industry involvement is likely to have been crucial for the marked increase in employability of graduates.

## **B. Lessons Learned for Project design and implementation**

82. ***Projects can achieve strong results in remote and less economically developed areas.*** Despite a limited implementation capacity, little experience with Bank projects, and remoteness in transportation, the support states/UT provided the political support and engagement to achieve the project's results. The project confirms that strong outcomes can be achieved despite remoteness.

83. ***Sustained sector involvement by the Bank improves outcomes.*** Project outcomes consistently improved from first Technician Education project to the third Technician Education project. For example, employment rates increased from 65 percent in the second Technician Education project to 70 percent in the third project. Female enrolment was raised from 30 percent and 28 percent in the first and second Technician Education project and to 38 percent in the third project. The Bank, MHRD and NPIU teams jointly climbed a learning curve in project implementation which resulted in better outcomes. Further, the sustained sector involvement was achieved through IEG evaluations and sector work. The increased focus on outcomes and efficiency is in particular notable across the three projects. Together, this produced a quality design, better monitoring and evaluation frameworks, and fostered effective and pro-active supervision.

84. ***Complete PAD with all indicators clearly defined and assumptions and detailed for economic analysis.***

85. ***Adherence to procurement guidelines requires continuous review in particular when procurement is decentralized.*** A decentralization of procurement responsibility seems to work more nimbly, but poses a greater challenge in oversight. Therefore, increased Bank oversight becomes necessary, in particular post reviews with follow-up and dissemination of findings. Further, procurement training needs to be further emphasized. Further, adequate participation of fiduciary specialists in review missions is necessary.

86. ***Set a side contingency for construction.*** Despite the advice, most states committed the allocated amounts fully at the time of signing contracts. This resulted in need for additional funds for price escalation, costs overruns, and other variations, which consequently had to be funded out of state budget which slowed down completion and increased uncertainty of funding. The shortage of funds implied that only 84 percent of the planned places hostel places for men could be constructed. Hence, the project confirms that governments should set aside a contingency funding when large scale construction is involved.

87. ***Field based supervision permits closer engagement of the Bank in project implementation.*** The majority of Bank team members supervised the project from the Country office (CO), which permitted more frequent interactions with project states, NPIU, and MHRD. The blend of HQ-based team-members bringing global experiences with CO-based members is likely to have increased quality of supervision and decreased costs of supervision.

## **7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners**

### **(a) Borrower/implementing agencies**

88. *Borrower's ICR is attached in full at Annex 7.* It provides more details on academic aspects of the project. The Bank's assistance and the role of the Bank team during the project design and implementation are appreciated.

### **(b) Cofinanciers**

89. *All states submitted state-wise ICR reports.* These were incorporated into the overall Borrowers' ICR. The full state reports are on file, and available at the NPIU. Each State appreciated the support of MHRD, NPIU and the Bank during project implementation.

### **(c) Other partners and stakeholders**

*(e.g. NGOs/private sector/civil society)*

Not applicable

## Annex 1. Project Costs and Financing

### (a) Project Cost by Component (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual Estimate (USD millions)	Percentage of Appraisal
CAPACITY DEVELOPMENT/ EXPANSION	48.18	48.49	101%
QUALITY ENHANCEMENT	22.85	21.55	94%
EFFICIENCY IMPROVEMENT	9.05	13.37	148%
<b>Total Baseline Cost</b>	<b>80.1</b>	<b>83.41</b>	<b>104%</b>
Physical Contingencies	0.00	0.00	0.00
Price Contingencies	0.00	0.00	0.00
<b>Total Project Costs</b>	<b>80.05</b>	<b>83.41</b>	<b>104%</b>
Project Preparation Fund	0.00	0.00	
Front-end fee IBRD	0.00	0.00	
<b>Total Financing Required</b>	<b>80.1</b>	<b>83.41</b>	<b>104%</b>

Note: Project costs by component are converted from INR to USD using the average of the quarterly exchange rate from Q2 2000 to Q2 2007 IMF International Financial Statistics, 45.92. In INR

### (b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
International Development Association (IDA)		64.9	71.0	109%
Borrower Government of India, including State Governments		15.2	12.4	81%
<b>Total</b>		<b>80.1</b>	<b>83.4</b>	<b>104%</b>

Note: Total project costs by component are converted from INR to USD using the average of the quarterly exchange rate from Q2 2000 to Q2 2007 IMF International Financial Statistics, 45.92.. IDA financing are reported using the exchange rate at the date of disbursing. Hence, the estimate financing of the Borrower could differ from the actual due to exchange rate fluctuations. The counterpart financing is not divided by Government of India and State governments, since the Borrower, Government of India, on-lent the IDA funds to the State Governments on soft terms.

## **Annex 2. Outputs by Component**

2.1. This annex presents the detailed numeric outputs of the project on a state level basis. Further, it shows the available indicators for comparable non-participating states, which is indicative of what is likely to have happened in the absence of the project.<sup>16</sup>

2.2. ***The availability of output and impact data is high.*** All indicators proposed in the PAD were tracked during project preparation with the exception of two overall project impact indicators, which were defined for this report. Further, all indicators are available on the state level. The actual value for the indicators reported in this report is end of school year 2006/07 unless indicated otherwise. Total project value for participating states/UT is calculated as the sum of state outcomes when appropriate and in the other cases as the un-weighted average across states/UT. Improvement over baseline value is computed as the percentage changes from baseline to actual for the states that reported a baseline value. Most indicators contained baseline value at approval. A moderate share of the indicators was defined as “additional”, whereby the baseline value by default became zero. For the remaining indicators, baseline values were included in the PAD, or baselines were established during the first two years of implementation.<sup>17</sup> Further, the PAD set out clear and ambitious targets.

2.3. ***The quality of the data is reasonable.*** Review missions and work between NPIU and the states focused extensively on collecting output and impact data.<sup>18</sup> However, data relies on self-reporting from the states, and there could in principle be deviations between project reports and reports to official statistical yearbooks. For future projects, the monitoring and evaluation system could, if possible, build upon official state reporting to the AICTE, although this may decelerate reporting of project indicators. Further, not all supported polytechnics have detailed management information systems capturing all aspects of the learning processes (such as use of learning resources) or tracking students’ progress across years. Hence, indicators regarding time for completion and drop out are for some polytechnics indicative. Also, some of the indicators rely on samples of students, principally labor market outcomes which imply a certain level of statistical uncertainty. Nevertheless, around half of the polytechnics conducted quality labor market surveys with acceptable sample-sizes and response rates from graduates. The seat capacity and enrolment data are in line with official data. Financial, budget and per student-cost information have also been substantiated with background documentation for the majority of the states.

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<sup>16</sup> Annex 10 Beyond the Numbers presents five personal experiences out of thousands of how the project offered an opportunity to improve the livelihood of beneficiaries.

<sup>17</sup> Two states: Arunachal Pradesh and Sikkim did not have fully operational polytechnics prior to this project. Hence, no baseline value is reported. Further, for a few indicators, states reported different baseline value than the early mission documents or the PAD. In these instances, the original baseline value from the PAD was maintained.

<sup>18</sup> Comments from State teams received through the ICR survey, Annex 5, suggested that less time is devoted to discussion of M&E indicators during joint review missions in order to spend more time on educational aspects of the project.

## Project Outcome and Impact Indicators

Time taken for completing the polytechnic diploma					
State/UT	Base-line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	3.6	3.2	3.4	106%	11%
Arunachal Pradesh	NA	3.4	3.4	100%	
Jammu & Kashmir	3.2	3.2	3.4	106%	0%
Meghalaya	NA	3.4	3.4	100%	
Mizoram	NA	3.5	3.4	97%	
Nagaland	3.2	3.5	3.4	97%	-9%
Sikkim	NA	3.3	3.4	103%	
Tripura	NA	3.1	3.4	109%	
<b>Total Project</b>	<b>3.3</b>	<b>3.3</b>	<b>3.4</b>	<b>102%</b>	<b>0%</b>

Note: Not all polytechnics have an information system capable of tracking students across years. Thus in certain instances, the above indicator is sampled information. Baseline data was not reported in the PAD. Baseline values were supplied by the states in 2001. Meghalaya, Mizoram, and Tripura reported 3.0, a perfect completion rate, which is not likely to have reflected the prevailing situation. Therefore, those values are not reported.

% of polytechnics graduates employed/self-employed within one year of graduation					
Base-line	Actual (a)	Actual (b) among graduates on labor market	Target	% of target achieved	State /UT
8%	78%	100%	65%	120%	A&N
NA	46%	100%	65%	71%	AP
30%	45%	45%	65%	69%	J&K
40%	64%	71%	65%	98%	MEG
NA	78%	84%	65%	120%	MIZ
50%	70%	100%	65%	108%	NAG
NA	88%	92%	65%	135%	SIK
60%	70%	70%	65%	108%	TRI
<b>38%</b>	<b>67%</b>	<b>83%</b>	<b>65%</b>	<b>104%</b>	<b>ALL</b>

Note: the source is NPIU reporting based on state reporting from tracer studies. For J&K, the source is the State ICR (45%). There are minor (single-digit) deviations from the employment rates calculated by the ICR team based on the state tracer studies. Based on the tracer studies, the average employment rate would increase to 70%. For J&K the state ICR is the source. Employment rate (a) counts graduates in further studies as not employed. Rate (b) excludes these graduates and is calculated directly from the state specific tracer studies. The PAD indicator focuses on employment only in the field of training of the graduates, while most of the tracer studies measures employment in all fields. Improvement over baseline was: 875% for A&N, 50% for J&K, 60% for Meghalaya, 40% for Nagaland, 17% for Tripura, and across states 208%. Baseline is from 2002.

Effectiveness and stage of implementation of proposed systemic reform in technical education in each state				
State/UT	Baseline	Actual	Target	
Andaman & Nicobar Islands		219%		
Arunachal Pradesh		256%		
Jammu & Kashmir		139%		
Meghalaya		107%		
Mizoram		105%		
Nagaland		94%		
Sikkim		89%		
Tripura		121%		
<b>Total Project</b>		<b>132%</b>		

Note: The project promoted several inter-related policies that in its entirety amounts to a systemic reform. Those policies were: (i) Autonomy, (ii) creation of state boards of higher education to professionalize the management of technical education, (iii) flexible course provision (measured by credit-based entry systems), (vi) interaction with industry (measured by composite indicator created below), and (v) increased generation of revenue. This indicator was constructed at project completion.

Nature and level of interaction with Industry				
Baseline	Actual	Target	% of target achieved	State /UT
-	432%	100%	432%	A&N
-	46%	100%	46%	AP
-	200%	100%	200%	J&K
-	92%	100%	92%	MEG
-	90%	100%	90%	MIZ
-	34%	100%	34%	NAG
-	70%	100%	70%	SIK
-	47%	100%	47%	TRI
<b>-</b>	<b>92%</b>	<b>100%</b>	<b>92%</b>	<b>ALL</b>

Note: This indicator is interpreted as the average of the achievement of targets in the following nine sub-component indicators for involvement of industry: students benefiting: (i) from industrial training, (ii) industrial visits, (iii) expert lectures, (iv) campus interview, (vi) participation in industrial projects, and Industry contribution to (vii) curriculum reform, (viii) student assessment, and (ix) to institutional governance. This indicator was constructed at project completion.

<b>% of women students enrolled in formal programs</b>					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	38.5	45.5	45	101%	18%
Arunachal Pradesh	NA	37	45	82%	
Jammu & Kashmir	29	41	56	73%	41%
Meghalaya	15	23	29	79%	53%
Mizoram	50	60	68	88%	20%
Nagaland	40	37	47	79%	-8%
Sikkim	NA	14.3	40	36%	
Tripura	25	47	40	118%	88%
<b>Total Project</b>	<b>30.0</b>	<b>38.4</b>	<b>47.6</b>	<b>81%</b>	<b>28%</b>

Note: The improvement from baseline of 28% was achieved in the states/UT that reported a baseline value. Total project value for participating states/UT is calculated as the share of women students in project states/UT of the student body. The enrolment of women students increased from 487 pre-project to 3,038 at the end of the project. That is a 524 % increase in the absolute number of women students.

<b>% of SC/ST students</b>					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
3%	2%	11%	18%	-33%	A&N
NA	74%	70%	106%		AP
NA	14%	7%	200%		J&K
95%	99%	95%	104%	4%	MEG
95%	92%	95%	97%	-3%	MIZ
98%	100%	98%	102%	2%	NAG
NA	43%	50%	86%		SIK
47%	47%	47%	100%	0%	TRI
<b>68%</b>	<b>59%</b>	<b>59%</b>	<b>100%</b>	<b>1%</b>	<b>ALL</b>

Note: The improvement from baseline of 1% was achieved in the states that reported a baseline value

<b>% of students from rural areas</b>					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	13	60	25	240%	362%
Arunachal Pradesh	NA	100	70	143%	
Jammu & Kashmir	60	50	45	111%	-17%
Meghalaya	6	45	70	64%	650%
Mizoram	55	70	75	93%	27%
Nagaland	53	100	80	125%	89%
Sikkim	NA	60	40	150%	
Tripura	50	48	60	80%	-4%
<b>Total Project</b>	<b>39.5</b>	<b>66.6</b>	<b>58.1</b>	<b>115%</b>	<b>57%</b>

Note: The improvement from baseline of 57% was achieved in the states that reported a baseline value

<b>% of cost recovery through internal revenue generation</b>					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
2.8%	5.4%			92.8%	A&N
NA	1.5%				AP
0.0%	0.0%				J&K
0.0%	3.9%				MEG
0.5%	1.8%			284.6%	MIZ
0.2%	0.5%			146.9%	NAG
NA	46.9%				SIK
1.4%	1.3%			-10.8%	TRI
<b>5%</b>	<b>8%</b>			<b>68.9%</b>	<b>ALL</b>

Note: Targets for IRG were set in absolute Rs. Amounts as shown in the table below for IRG in component 3.

<b>Enrolled students</b> (Increase in number of student places and demand for the same)					
State/UT	Base line	Actual	Target	% of target achieved	% of improve ment from baseline
Andaman & Nicobar Islands	291	624	670	93%	114%
Arunachal Pradesh	0	364	399	91%	
Jammu & Kashmir	419	3313	2,537	131%	691%
Meghalaya	298	993	1,064	93%	233%
Mizoram	120	480	684	70%	300%
Nagaland	165	620	770	81%	276%
Sikkim	0	615	998	62%	
Tripura	330	910	608	150%	176%
<b>Total Project</b>	<b>1,623</b>	<b>7919</b>	<b>7,728</b>	<b>102%</b>	<b>388%</b>
<b>Adjusted Project</b>	<b>1,623</b>	<b>8,233</b>	<b>7,728</b>	<b>107%</b>	<b>407%</b>

Note: Target inferred from the targets of additional seats and seat utilization. The source for actual enrolled students in J&K is the Govt. of J&K's presentation at the 12<sup>th</sup> JRM in June 07, which included students from Leh and Kargil. 10 (ten) of the new three-year diploma programs enrolled students for the first time in 2004/05. Consequently, the current student population does not include any third-year students for these programs, although the capacity is available. This indicator projects the expected student population if these programs had started a year earlier and thus would have had third-year enrolled students. The aggregated yearly intake of students in these 10 programs is 330 students, which at the expected utilization rate of 95 % implies an additional student population of 314.

## Overview of State-wise performance achievement of targets

PDO	State /UT	Expansion	Access for disadvantaged			Quality				Economic needs		Efficiency		Average	
			Sys. Reform	New seats	Women	ST/SC	Rural	% of curriculum	Labs modernized	Teach/ & Staff Training	Empl. Rate	Indu. Inter-action	Com-munity Service		Compl. Time
	A&N	225%	141%	101%	18%	240%	100%	142%	106%	120%	432%	175%	106%	620%	<b>194%</b>
	AP	257%	107%	82%	106%	143%	100%	194%	99%	71%	57%	68%	100%	1087%	<b>190%</b>
	J&K	147%	158%	73%	200%	111%	138%	133%	100%	69%	200%	365%	106%	159%	<b>151%</b>
	MEG	124%	100%	79%	104%	64%	100%	100%	109%	98%	92%	344%	100%	63%	<b>114%</b>
	MIZ	112%	59%	88%	97%	93%	100%	94%	118%	120%	90%	291%	97%	112%	<b>113%</b>
	NAG	108%	100%	79%	102%	125%	100%	108%	103%	108%	34%	86%	97%	135%	<b>99%</b>
	SIK	85%	111%	36%	86%	150%	92%	210%	81%	135%	70%	179%	103%	63%	<b>108%</b>
	TRI	146%	204%	118%	100%	80%	130%	94%	110%	108%	47%	507%	108%	17%	<b>136%</b>
	<b>ALL</b>	<b>127%</b>	<b>122%</b>	<b>81%</b>	<b>100%</b>	<b>115%</b>	<b>107%</b>	<b>122%</b>	<b>99%</b>	<b>104%</b>	<b>93%</b>	<b>253%</b>	<b>102%</b>	<b>121%</b>	<b>119%</b>

Note: The achievement of target should not be used to designate best performers or be interpreted as a ranking. State performance should also be judged against the ambitiousness of the targets set and improvement over baseline.

## Component 1: Developing/Expanding Capacity of Technician Education System

Increased number of polytechnics: Number of New polytechnics					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	0	0	0		
Arunachal Pradesh	0	1	1	100.0%	
Jammu & Kashmir	0	2	0		
Meghalaya	0	2	2	100.0%	
Mizoram	0	0	0		
Nagaland	0	1	1	100.0%	
Sikkim	0	2	2	100.0%	
Tripura	0	1	0		
<b>Total Project</b>		<b>9</b>	<b>6</b>	<b>150.0%</b>	

Increased number of programs: Number of New Diploma Programs					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
0	4	4	100.0%		A&N
NA	6	6	100.0%		AP
0	15	8	187.5%		J&K
0	8	8	100.0%		MEG
0	3	3	100.0%		MIZ
0	6	6	100.0%		NAG
NA	10	12	83.3%		SIK
0	8	5			TRI
<b>0</b>	<b>60</b>	<b>52</b>	<b>115.4%</b>		<b>ALL</b>

Increased enrolment capacity: Additional Number of Student Places					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	0	338	240	141%	
Arunachal Pradesh	0	450	420	107%	
Jammu & Kashmir	0	1560	990	158%	
Meghalaya	0	670	670	100%	
Mizoram	0	160	270	59%	
Nagaland	0	585	585	100%	
Sikkim	0	1170	1050	111%	
Tripura	0	570	280	204%	
<b>Total Project</b>	<b>0</b>	<b>5503</b>	<b>4505</b>	<b>122%</b>	

Increased number of hostel places: Additional Hostel Places (Men)					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
0	42	42	100.0%		A&N
NA	87	100	87.0%		AP
0	81	81	100.0%		J&K
0	240	300	80.0%		MEG
NA	120	120	100.0%		MIZ
0	90	90	100.0%		NAG
NA	405	540	75.0%		SIK
0	0	0			TRI
<b>0</b>	<b>1065</b>	<b>1273</b>	<b>83.7%</b>		<b>ALL</b>

Increased number of hostel places: Additional Hostel Places (Women)					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	0	24	24	100.0%	
Arunachal Pradesh	0	63	60	105.0%	
Jammu & Kashmir	0	520	448	116.1%	
Meghalaya	0	120	120	100.0%	
Mizoram	0	150	150	100.0%	
Nagaland	0	180	195	92.3%	
Sikkim	0	195	260	75.0%	
Tripura	0	0	0	-	
<b>Total Project</b>	<b>0</b>	<b>1252</b>	<b>1257</b>	<b>99.6%</b>	

Number of Faculty Residences					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
5	17	13	130.8%	240%	A&N
NA	17	17	100.0%		AP
12	37	45	82.2%	208%	J&K
3	26	34	76.5%	767%	MEG
NA	24	25	96.0%		MIZ
18	28	44	63.6%	56%	NAG
NA	40	38	105.3%		SIK
12	12	12	100.0%	0%	TRI
<b>50</b>	<b>201</b>	<b>228</b>	<b>88.2%</b>	<b>302%</b>	<b>ALL</b>



Number of Staff Residences					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	27	42	31	135.5%	56%
Arunachal Pradesh	NA	8	10	80.0%	
Jammu & Kashmir	2	18	20	90.0%	800%
Meghalaya	NA	32	45	71.1%	
Mizoram	NA	24	24	100.0%	
Nagaland	13	33	31	106.5%	154%
Sikkim	NA	32	32	100.0%	
Tripura	12	12	12	100.0%	0%
<b>Total Project</b>	<b>54</b>	<b>201</b>	<b>205</b>	<b>98.0%</b>	<b>272%</b>

Increased number of programs for industry and community: Continuing Education Beneficiaries					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
110	2923	150	1948.7%	2557%	A&N
na	117	300	39.0%		AP
na	614	285	215.4%		J&K
na	365	300	121.7%		MEG
an	171	100	171.0%		MIZ
10	170	640	26.6%	1600%	NAG
na	433	380	113.9%		SIK
na	350	300	116.7%		TRI
<b>120</b>	<b>5143</b>	<b>2455</b>	<b>209.5%</b>	<b>4186%</b>	<b>ALL</b>

Increased Use of Computers by Students and Staff: Establishment of a Computer center in each Polytechnic					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands		Yes	Yes	100%	
Arunachal Pradesh		Yes	Yes	100%	
Jammu & Kashmir		Yes	Yes	100%	
Meghalaya		Yes	Yes	100%	
Mizoram		Yes	Yes	100%	
Nagaland		Yes	Yes	100%	
Sikkim		Yes	Yes	100%	
Tripura		Yes	Yes	100%	
<b>Total Project</b>				<b>100.0%</b>	

Learning resources purchased/issued					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
0	2,102	345	609%		A&N
0	1,705	450	379%		AP
0	6,562	6,900	95%		J&K
0	475	794	60%		MEG
0	2,153	424	508%		MIZ
0	534	1,030	52%		NAG
0	1,708	347	492%		SIK
0	318	375	85%		TRI
<b>0</b>	<b>15,557</b>	<b>10,665</b>	<b>146%</b>		<b>ALL</b>

Note: this indicator was modified from average computer hours of use per week per student. Due to the complexity of credibly measuring hours used. The indicator measures the establishment of the computer center for students. 20 Computer centers were established. The utilization of the computer centers/labs was investigated by the utilization study from 2006. It found that the computer centers were extensively used. In most cases over 30 hours per week for formal teaching, not counting use for community training programs.

Note: Redefined from average Number of Learning Resources Issued/Student/Year. Learning resources are defined as transparencies, learning packages, Models, Lab manuals, Video programs, and multi-media programs

<b>Increased number of programs for industry and community: Community Program Beneficiaries</b>					
<b>State/UT</b>	<b>Base line</b>	<b>Actual</b>	<b>Target</b>	<b>% of target achieved</b>	<b>% of improvement from baseline</b>
Andaman & Nicobar Islands	155	1837	1050	175.0%	1085%
Arunachal Pradesh	0	389	570	68.2%	
Jammu & Kashmir	0	6610	1810	365.2%	
Meghalaya	0	3095	900	343.9%	
Mizoram	0	1748	600	291.3%	
Nagaland	116	998	1160	86.0%	760%
Sikkim	0	1074	600	179.0%	
Tripura	0	2281	450	506.9%	
<b>Total Project</b>	<b>271</b>	<b>18032</b>	<b>7140</b>	<b>252.5%</b>	<b>6554%</b>

### Component 2: Enhancing Quality of Technician Education

<b>Upgraded laboratories and workshops: Number of Labs &amp; Workshops Modernized</b>					
<b>State/UT</b>	<b>Base line</b>	<b>Actual</b>	<b>Target</b>	<b>% of target achieved</b>	<b>% of improvement from baseline</b>
Andaman & Nicobar Islands	0	24	13	185%	
Arunachal Pradesh	0	0	0		
Jammu & Kashmir	0	60	55	109%	
Meghalaya	0	13	13	100%	
Mizoram	0	16	18	89%	
Nagaland	0	19	19	100%	
Sikkim	0	0	0		
Tripura	0	11	9	122%	
<b>Total Project</b>	<b>0</b>	<b>143</b>	<b>127</b>	<b>113%</b>	

<b>Establishment of new laboratories and workshops: Number of Labs &amp; Workshops Established</b>					
<b>Base line</b>	<b>Actual</b>	<b>Target</b>	<b>% of target achieved</b>	<b>% of improvement from baseline</b>	<b>State /UT</b>
0	9	9	100%		A&N
0	31	16	194%		AP
0	93	59	158%		J&K
0	14	14	100%		MEG
0	19	19	100%		MIZ
0	14	12	117%		NAG
0	21	10	210%		SIK
0	20	30	67%		TRI
0	<b>221</b>	<b>169</b>	<b>131%</b>		<b>ALL</b>

<b>Labor market Relevant Curricula: % of Curricula Updated within last 5 years</b>					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	0	100	100	100.0%	
Arunachal Pradesh	0	100	100	100.0%	
Jammu & Kashmir	0	100	100	100.0%	
Meghalaya	0	100	100	100.0%	
Mizoram	0	100	100	100.0%	
Nagaland	0	100	100	100.0%	
Sikkim	0	100	100	100.0%	
Tripura	0	100	100	100.0%	
<b>Total Project</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>100.0%</b>	

<b>Labor market Relevant Curricula: Number of New Curricula Developed</b>					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
0	4	4	100.0%		A&N
0	6	6	100.0%		AP
0	14	8	175.0%		J&K
0	7	7	100.0%		MEG
0	3	3	100.0%		MIZ
0	6	6	100.0%		NAG
0	10	12	83.3%		SIK
0	8	5	160.0%		TRI
<b>0</b>	<b>58</b>	<b>51</b>	<b>113.7%</b>		<b>ALL</b>

<b>Flexibility in Program Offering: Number of Programs with MPE &amp; CS</b>					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	0	6	6	100.0%	
Arunachal Pradesh	0	6	6	100.0%	
Jammu & Kashmir	0	24	28	85.7%	
Meghalaya	0	11	12	91.7%	
Mizoram	0	8	8	100.0%	
Nagaland	0	10	10	100.0%	
Sikkim	0	10	12	83.3%	
Tripura	0	5	6	83.3%	
<b>Total Project</b>	<b>0</b>	<b>80</b>	<b>88</b>	<b>90.9%</b>	

<b>Improved Staffing: % of existing and new Teaching Posts Filled</b>					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
	87%	90%	96.7%		A&N
	100%	90%	111.1%		AP
	71%	90%	79.2%		J&K
	100%	90%	111.1%		MEG
	86%	90%	95.2%		MIZ
	100%	90%	111.1%		NAG
	80%	90%	89.3%		SIK
	84%	90%	92.9%		TRI
	<b>89%</b>	<b>90%</b>	<b>98%</b>		<b>ALL</b>

<b>More Competent Teachers and Non-teaching Staff: Number of Teachers Trained</b>					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	0	42	45	93.3%	
Arunachal Pradesh	0	31	30	103.3%	
Jammu & Kashmir	0	233	190	122.6%	
Meghalaya	0	71	74	95.9%	
Mizoram	0	42	48	87.5%	
Nagaland	0	53	53	100.0%	
Sikkim	0	41	61	67.2%	
Tripura	0	47	48	97.9%	
<b>Total Project</b>	<b>0</b>	<b>560</b>	<b>549</b>	<b>102.0%</b>	

<b>More Competent Teachers and Non-teaching Staff: Number of Technical Support Staff Trained</b>					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
0	72	61	118.0%		A&N
0	20	21	95.2%		AP
0	203	265	76.6%		J&K
0	55	45	122.2%		MEG
0	37	25	148.0%		MIZ
0	40	38	105.3%		NAG
0	35	37	94.6%		SIK
0	38	31	122.6%		TRI
<b>0</b>	<b>500</b>	<b>523</b>	<b>95.6%</b>		<b>ALL</b>

**Increased and effective interaction between industry and polytechnics: Number of students involved in collaborative efforts with industry**

State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	216	1,825	620	501%	745%
Arunachal Pradesh	0	710	1,270	91%	-
Jammu & Kashmir	204	6,678	7,892	90%	3174%
Meghalaya	189	3,067	2,922	109%	1523%
Mizoram	177	1,403	1,330	103%	693%
Nagaland	279	770	1,540	68%	176%
Sikkim	0	1,985	1,820	124%	-
Tripura	0	1,353	1,565	50%	-
<b>Total Project</b>	<b>1,065</b>	<b>17,791</b>	<b>18,959</b>	<b>85%</b>	<b>1571%</b>

Note: Collaborative efforts include industrial training, industrial visits, expert lectures, campus interview, and participation in industry projects.

**Component 3: Improved Efficiency of Technician Education System**

Reduction in Student Drop-outs: Dropout Rate (%)					
State/UT	Base line	Actual	Target	% of target achieved	% of improvement from baseline
Andaman & Nicobar Islands	6	2.5	3.0	120%	58%
Arunachal Pradesh	NA	6.0	5.0	83%	
Jammu & Kashmir	10	10.0	5.0	50%	0%
Meghalaya	10	4.0	3.0	75%	60%
Mizoram	5	3.0	1.0	33%	40%
Nagaland	5	5.0	5.0	100%	0%
Sikkim	NA	5.0	5.0	100%	
Tripura	2	1.0	2.0	200%	50%
<b>Total Project</b>	<b>6.3</b>	<b>4.6</b>	<b>3.6</b>	<b>79%</b>	<b>28%</b>

Improved cost recovery: Internal Revenue Generation (IRG) in million Rs.					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
0	17.4	2.8	620%		A&N
0	18.3	1.7	1087%		AP
0	23.9	15.0	159%		J&K
0	1.8	2.8	63%		MEG
0	3.5	3.1	112%		MIZ
0	5.3	4.0	135%		NAG
0	35.5	56.1	63%		SIK
0	0.3	1.8	17%		TRI
<b>0</b>	<b>105.9</b>	<b>87.3</b>	<b>121%</b>		<b>ALL</b>

Note: States differed markedly in targets for internal revenue generated. The above indicator measures achievement according to targets. However, if achievement of IRG was assessed based on absolute amount generated, the State of Sikkim would have achieved the highest revenue.

Improved management of Polytechnics: Number of Polytechnics with Autonomy					
State/UT	Base line	Actual	Target	% of target achieved	
Andaman & Nicobar Islands	0%	100%	75%	133%	
Arunachal Pradesh	0%	100%	100%	100%	
Jammu & Kashmir	0%	63%	50%	125%	
Meghalaya	0%	88%	50%	175%	
Mizoram	0%	50%	50%	100%	
Nagaland	0%	88%	50%	175%	
Sikkim	0%	75%	100%	75%	
Tripura	0%	63%	25%	250%	
<b>Total Project</b>	<b>0%</b>	<b>78%</b>	<b>63%</b>	<b>125%</b>	

Note: This indicator measures award of autonomy to the polytechnics from state governments. Four areas of autonomy were defined at project approval: Financial, academic, managerial, and administrative. Each type is counted with an equal share of 25 percentage points. If polytechnics enjoy partial autonomy within an area, a contribution of 12.5 percentage points is added. The targets are converted from text in the detailed project description in the PAD as follows: Full autonomy = 100%; High/Substantial degree = 75%; Significant = 50%; and modest = 25%.

Improved management of Technician Education System: Time Taken To Publish Results (Weeks)					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
NA	6	4	50%		A&N
NA	4	4	100%		AP
8	5	4	75%	38%	J&K
8	3	4	120%	60%	MEG
8	3	3.5	114%	63%	MIZ
NA	4	4	100%		NAG
NA	2	4	150%		SIK
8	7	4	25%	13%	TRI
<b>8.0</b>	<b>4.3</b>	<b>3.9</b>	<b>91%</b>	<b>43%</b>	<b>ALL</b>

Operationalization of MIS and FMS					
State/UT	Base line	Actual	Target	% of target achieved	
Andaman & Nicobar Islands	0	100%	100%	100%	
Arunachal Pradesh	0	75%	100%	75%	
Jammu & Kashmir	0	75%	100%	75%	
Meghalaya	0	75%	100%	75%	
Mizoram	0	75%	100%	75%	
Nagaland	0	75%	100%	75%	
Sikkim	0	75%	100%	75%	
Tripura	0	75%	100%	75%	
<b>Total Project</b>	<b>0%</b>	<b>78%</b>	<b>100%</b>	<b>78%</b>	

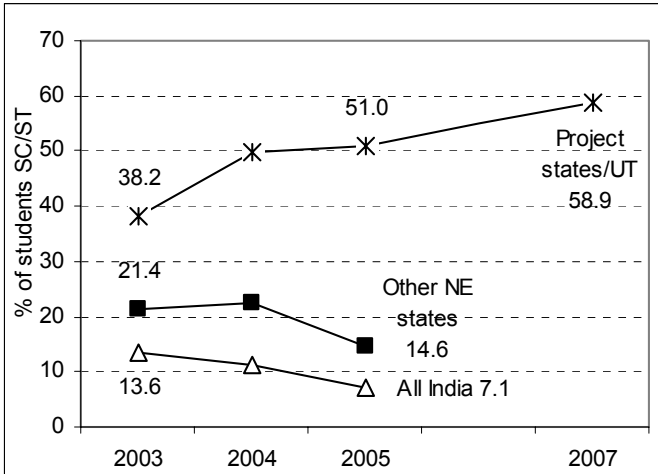
Operationalization of a computer-based project and financial management system was a requirement under the mandatory Loan Administration Change Initiative (LACI) in Bank project approved from 1998 to 2001. This system was successfully developed by external consultants, installed in all states, and all SPIUs received training. In December 2001, the Bank made its guidelines for Project Financial Management more flexible and dropped the requirement of a standardized, fully integrated project management system. Given the downsides of the fully integrated project system and its implementation difficulties, the project partners decided not to implement the developed system in all project states. Only A&N islands fully used the project management system.

% of student seats filled (utilization rate)					
Base line	Actual	Target	% of target achieved	% of improvement from baseline	State /UT
63%	78%	95%	82%	24%	A&N
NA	81%	95%	85%		AP
25%	102%	95%	108%	310%	J&K
66%	89%	95%	93%	34%	MEG
27%	84%	95%	88%	214%	MIZ
73%	91%	95%	96%	24%	NAG
NA	53%	95%	55%		SIK
92%	98%	95%	103%	7%	TRI
<b>58%</b>	<b>84%</b>	<b>95%</b>	<b>89%</b>	<b>46%</b>	<b>ALL</b>

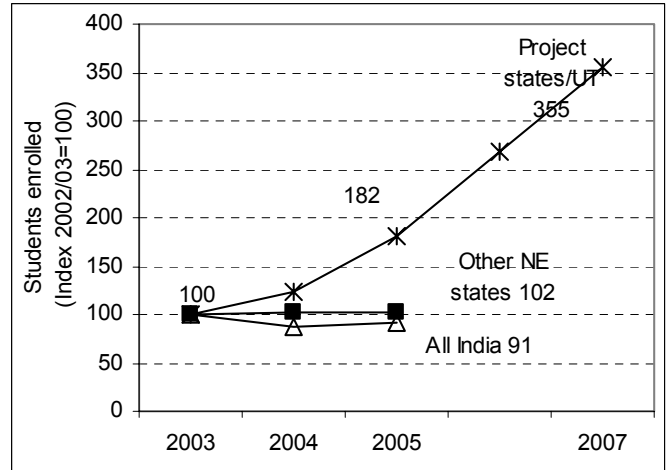
## Comparison of outcomes in project states/UT with outcomes in non-project states

2.4. The figures below compare key project outcomes in project states with comparable North-Eastern states that did not participate in the project (Manipur and Assam) and at the national level. A similar comparison for other indicator is not possible due to unavailability of data.

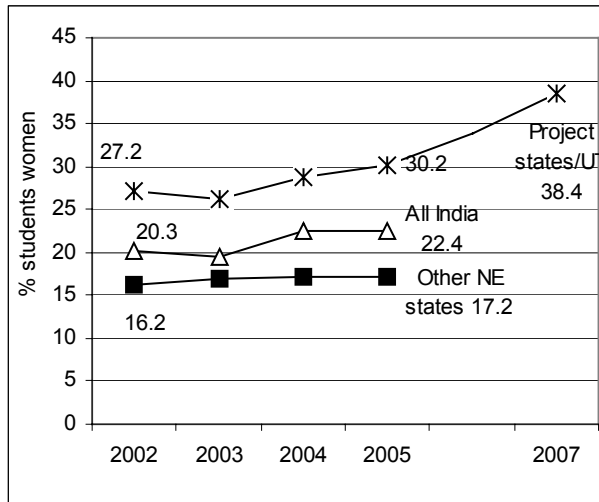
**Figure 3 Enrolment of SC/ST students in Technician Education**



**Figure 4 Expansion of Technician Education**



**Figure 5 Enrolment of women students in Technician Education**



Note: Data for the national level and other North-Eastern States are the latest publicly available.  
Source: AICTE

## Annex 3. Economic and Financial Analysis

3.1. *The project assisted 21 Polytechnics and 8 states/UT in substantially improving efficiency.* Per student cost was reduced by 35 percent primarily through an increase in the utilization from 40 percent to 92 percent. Internal efficiency was also improved by a small decrease in repetition, although smaller improvement than targeted. External efficiency was equally enhanced. Employment rates of graduates increased from 38 percent to 70 percent. The economic and financial annex in the PAD presented internal efficiency, external efficiency (employment prospects), a cost-benefit analysis, and state fiscal implications. This annex reviews the pre-project economic analysis.<sup>19</sup>

### Internal Efficiency

3.2. *The supported polytechnics made considerable gains in internal efficiency over the lifetime of the project.* Improvement in internal efficiency raises the returns from the project by lowering the unit costs of producing a graduate, and vice-versa. The project aimed at strong internal efficiency as indicated by high target values for internal efficiency indicators set in the PAD.

3.3. *Average annual per student cost declined 35 percent in real terms.* The cost of training a student is a summary figure for estimating internal efficiency of any educational/training institution. Institutions with lower average training costs are considered more efficient. Importantly, this measure does not take into account quality of education. Total costs reflect expenditure on quantity and quality dimensions of providing education and training (the size of the student population, the size of the teaching force, materials, infrastructure, training of trainers etc). A comparison of the pre-project, target, and end-of-project average training costs shows that major cost savings took place in most states. On average across the states, student costs were reduced from Rs. 32,100 to 20,900 (35 percent). This represents a 113 percent achievement of the target. In fact, only in one state, Mizoram, did real costs increase (and this was only by 2 percent). In other states, average per student costs was reduced, for example in J&K costs decreased from Rs. 65,000 to 15,300 and 19,500 (77 percent improvement).

**Table 4 Average Training Cost Student/Year (Rs.)**

State	Pre-Project Status	Present Status (2007 Rupees)	Present Status (99-00 Rs)	Target	% of target achieved	% of improvement over baseline
A&N Islands	30,000	30,500	23,293	31,000	125%	22%
Arunachal Pradesh	na	29,600	22,606	28,000	119%	
Jammu & Kashmir	65,000	20,000	15,274	20,000	124%	77%
Meghalaya	26,206	30,000	22,911	34,000	133%	13%
Mizoram	15,000	20,000	15,274	12,000	73%	-2%
Nagaland	33,500	27,000	20,620	19,500	94%	38%
Sikkim	na	38,000	29,021	24,000	79%	
Tripura	23,000	24,000	18,329	23,000	120%	20%
<b>Total project (average)</b>	<b>32,118</b>	<b>27,388</b>	<b>20,916</b>	<b>23,938</b>	<b>113%</b>	<b>35%</b>

Source: Third Technician Education Project, Review Report May-June 2007, National Project Implementation Unit, Government of India

Note: Average training costs include recurrent costs only. Hence, it excludes capital costs. The deflator used is the Price Index by the Reserve Bank of India.

<sup>19</sup> The PAD economic analysis equally discussed the justification of public intervention, which will not be revisited in this analysis, since it is briefly discussed in other sections of this report.

3.4. ***The main factor driving the cost savings were an increase from an average of 54 percent to 84 percent in the utilization of available seats.*** At the time of the inception of the project, utilization rates varied considerably between states and were less than optimal for the existing polytechnics in the project states. The ratio of enrolment to sanctioned number of seats was a poor 54 percent on average, ranging from as low as 25 percent for Jammu & Kashmir and 27 percent for Mizoram to 92 percent for Tripura. Given that most training costs are fixed costs—in particular for teacher and staff salaries—optimizing the use of the available seats is crucial for efficiency. At the close of the project, the average enrolment rate for all project polytechnics increased to 84 percent; and except for Sikkim (53 percent), the utilization rates exceed 80 percent in all project states/UT. The comparatively low rate in Sikkim is due to the recent introduction of six new diploma courses, and there were therefore no third year students yet in 2006/07. The high cost-recovery could also play a high role. The rise in utilization rates were driven by increased demand for technician education that emerged from improved infrastructure, equipment, promotion, and public attention to the project. In this sense, the objectives of jointly improving quality, efficiency, and access (expansion) were mutually reinforcing.

3.5. ***Internal efficiencies took place through a reduction in the drop out and an increase in the pass rate.*** The above indicator does not measure cost per graduate, which requires detailed information regarding student flows through grades. However, cost per graduate is expected to have improved further than suggested from the cost per student year, since drop-out rate improved over the base-line. Drop-out was low to begin with; 6.3 percent across states with drop-out rates varying from 2 percent in Tripura to 10 percent in Jammu & Kashmir and Meghalaya. Therefore gaining any further reduction was bound to be difficult. At end-of-project, drop out was reduced by 1.6 percentage point to 4.6 percent on average. The base-line pass-rates of students (at first attempt) varied from 70-78 percent. At project closing, pass-rates had improved for all project polytechnics, ranging from 80-95 percent. All state-wise indicators of seats filled, pass-rates and drop-out rates are provided in Annex 2.

### **External Efficiency**

3.6. **The project enhanced external economic benefit through improvement in the labor market prospects of graduates of polytechnics.** Table 5 provides employment rates (within one year of graduation) and current average monthly wages.<sup>20</sup> As discussed in the main text 72 percent of graduates from the 05/06 batch of students found employment within one year of graduation (Column (a)). The PAD target was 65 percent (127 percent achievement). Taking into account the proportion of graduates that continued their studies at a higher level (mostly engineer studies) the employment rate achieved was 83 percent (Column (b)).<sup>21</sup> Hence, an unemployment rate of 17 percent after one year of graduation in less developed economic states. This outcome compares favorably with overall youth unemployment in India: 18 percent of graduates from secondary education remain unemployed (0-4 years after graduation) and 25 percent for graduates of higher education (also 0-4 years after graduation), World Bank (2007). However, there is still room for improvement. For Jammu & Kashmir, the lower employment rate is presumably due to

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<sup>20</sup> The data in the table come from end tracer studies for graduates from 2005/06 conducted by each participating state and polytechnic.

<sup>21</sup> A diploma level technician education qualifies for entry into the second year of engineering degree at most schools. Given the strong Indian labor market for engineers - 18 percent rate of return to higher education in general, World Bank(2007), it is unsurprising that non-negligible share of 11 percent of graduates choose to continue further education. This seems in particular to be the case in Arunachal Pradesh, A&N Islands (where the Polytechnics administer several post-diploma programs) and Sikkim.



the long-running unsettled political situation, the absence of large-scale industry in the state, and a lower overall female participation in the labor market.

3.7. **The main drivers of improved labor market outcomes seem to have been the set of policies that increased linkages with the private sector, and the set of investments that created new programs, improved equipment, updated curriculum, and trained faculty.** However, other factors such as a favorable economic environment are likely to have aided as well. Sorting out empirically the impact of curriculum reform, equipment purchase, private sector linkages, and the context in the labor markets, would be necessary to draw firm conclusions about cause and impact. The project database contains a large set of indicators that through such a study could be further mined to rigorously draw lessons. However, this extends beyond this report.

**Table 5 Labor Market Outcomes for Graduates of Project Polytechnics**

State/Polytechnic	Graduating Year	Employment Rate (a)	Employment Rate excluding graduates pursuing further education (b)	Average Wages (Current Rs. per month)	Average Wages (1999-2000 Constant Rs. per month)	Pre-Project Estimated Average Wages for a 10% return (Rs. per month)**
Andaman & Nicobar Islands (Ambedkar & Second PT)	2005-06	73.0%	100%	5,112	3,904	4,420
Arunachal Pradesh Rajiv Gandhi PT, Itanagar	2005-06	54%	100%			3,990
Jammu & Kashmir (GPBC Jammu, and GWP Srinagar)	2005-06	39% <sup>#</sup>	45% <sup>#</sup>			4,070
Meghalaya (Shillong, Tura and Jowai Polytechnics)	2004-06	64%	71%	-	-	
Mizoram Mizoram Polytechnic, Lunglei	2005-06	90%	93.7%	4,193	3,202	4,420
Women's Polytechnic, Aizwal	2005-06	73.7%	73.7%	6,219	4,750	5,150
Nagaland Khelhoshe PT, Atoize	2004-06	95%	100%			
Government PT, Kohima	2004-06	100%	100%			-
Institute of ICT	2004-06	85%	100%			
Sikkim ATTC, Bardang	2005-06	85.6%	93.7%	4,315	3,295	3,693
CCCT, Chisopani	2005-06	76.9%	90.2%	4,102	3,133	3,376
Tripura PT, Narsinghagarh	2005-06	70% <sup>*</sup>	70% <sup>*</sup>			3,334

Source: Tracer studies provided by states/UT. The above rates differ slightly from the NPIU reported rates in Annex 2. Only double digit deviation is in the case of J&K, where the above is based on information from only two of the six polytechnics in that state. \*Source: State ICR; # Average for two polytechnics. \*\* It is assumed that graduates of secondary education in the project states earn Rs. 500 per month (also assumed in the PAD economic analysis). The actual national value in the National Labor Survey, NSS, from 2004-05 for a secondary education graduate is INR. 520 per month. Hence, the assumption made in the PAD was realistic.

Note: Column (a) indicates the share of employed graduates within one year of graduation. Column (b) presents the share of employed graduates within one year of graduation out of all graduates on the labor market (excluding graduates that pursue further education). Graduates from 2005-06 with the exception of Nagaland (where 2004/05 graduates were included with the graduates of 2005/06 as well). Data from newly established Polytechnics (in Leh, J&K; and Kargil, J&K, and Women Polytechnic, Tripura) were not available.

## Cost-Benefit Analysis

3.8. *A new simple cost-benefit analysis indicates that the project's internal rate of return (IRR) was between 22 percent and 26 percent.*

3.9. *It was not possible to use the same methodology as the original cost-benefit analysis presented in the PAD due to the lack of description of the applied methodology.* The analysis was based on projections of recurrent costs, capital costs, and foregone earnings. Regrettably, this analysis could not be updated since the PAD did not contain the necessary information regarding: length of employment, employment rate, age-earning profiles over time, graduation rates and calculation of capital costs. These should have been clearly described in the PAD. This is especially important since annual per student costs declined markedly during the project. The last column in Table 5 shows the PAD project estimates of required average monthly wages necessary for a 10 percent return on project investment costs. The salaries of graduates (in real terms) amount to 87 percent of the necessary salary for the project to have a 10 percent rate of return. However, the rate of return increases substantially if the calculation took into account the end-of-project actual costs and labor market outcomes. Therefore a new simple cost-benefit analysis was undertaken.

3.10. *The applied IRR methodology is simple and relies upon the data available.* As is standard, the internal rate of return is defined as the interest rate that makes the net present value of costs equal to the net present value of estimated benefits. The estimation is based on state specific information from three of the eight states/UT (Andaman and Nicobar Islands, Mizoram and Sikkim). The three states for which the tracer studies collected salary information. The benefit is the life-time salary differential of the graduates of polytechnic education compared to the expected salary of a graduate with secondary education for the students who received technical education during the lifetime of the project (in the three project states). The IRR takes into account the project costs (mostly capital costs), the recurrent costs, and indirect private costs (e.g. foregone earnings from studying). In particular, the assumptions were:

- Direct private costs of education, such as cost of additional lodging, uniforms and study material, are zero.
- Pre-project capital costs are not included.
- Graduates of secondary education is both grade 10 and grade 12 graduates, which reflects the mixed entry level into polytechnic education.
- Wage growth of graduates of secondary education and graduates of polytechnics are identical and equal to the wage-growth observed in the 61<sup>st</sup> Round of the National Sample Survey 2004-05. This assumption is used to estimate the expected age-earnings profile over the expected 40 years of labor market participation (age 20-60). Based upon international experience, the wage of polytechnic graduates tends to increase more with experience than the wage of graduates of secondary education. However, there is not enough data to calculate the difference.
- Number of students for the three states was 6,278. The increase in students is assumed to be gradual over the project's five years of effectiveness. Consequently, the salary differential of future students is not included in the calculation. Similarly, the wage gain from beneficiaries of vocational education and community services are not included in the estimation.
- Students dropping out or not passing the final exam is assumed to receive a salary equivalent to graduates. The tracer studies does not contain salary information for these two relative small groups of beneficiaries.

- Other benefits such as inter-cohort externalities, higher firm productivity, higher absorption capacity of technology in local firms, better health, and gains in efficiency of public expenditure through improved practices and systems have not been included.

Further, the IRR is calculated for three levels of unemployment: 5 percent, 10 percent and 15 percent. Empirical evidence at the national level shows that 95 percent of graduates with technical education find employment within a period of 5 years. This could be higher for graduates of the supported polytechnics, since a higher share of project graduates were employed 6 months after graduation compared to national level data from earlier projects. The IRR is computed under these three scenarios to assess robustness of results to different risk-scenarios.

3.11. ***In the three scenarios, the IRR is more than twice the rate projected at appraisal (10 percent).*** However, given it is a simple cost-benefit analysis for only three of the eight states/UT, the result should be interpreted as indicative.

**Table 6 Internal Rate of Return**

Assumed Unemployment rate of graduates	5%	10%	15%
IRR	26%	24%	22%

### **Financial Sustainability**

3.12. The sectoral impact of the project will depend on support – fiscal and political – for the project polytechnics after project completion. There will have to be a steady flow of adequate resources to each institution for salary of teachers and staff, learning resources, maintenance and repair, faculty development, equipment replacements, and continuous curriculum updating.

3.13. There are two main sources of fiscal support for the polytechnics: (a) the state budget; and (b) revenue generated internally by the polytechnics.

3.14. All the project states are special category states (except for the Union Territory of Andaman & Nicobar Islands), which are almost entirely dependent on central transfers for both plan and non-plan expenditures.<sup>22</sup> For these states, combined central transfers (central taxed plus grants) account for nearly 90 percent of total revenue receipts. This implies that to some extent each state’s funding of the polytechnics will depend on central assistance to them. Allocation of the total education budget to different education sub-sectors, however, depends on the state governments’ decisions.

3.15. It was agreed at project approval that annual recurrent costs arising at the end of the project period will be borne by the state governments. Under the project, institutions have increased their own internal revenue generation, which along with state funding will contribute to regular funding for the institutions. However, only in the case of Sikkim does IRG exceed 10 percent of the annual budget.

3.16. Table 7 below shows the internal revenue generation (IRG) by project states in 2001 and 2006. Although, IRG has increased both absolutely and relative to total budget. The size of internal revenue is small relative to recurrent expenditures requirement with the notable exception of Sikkim.

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<sup>22</sup> The budget of Andaman & Nicobar Islands is part of the central government’s budget.

**Table 7 The role of IRG in Financial Sustainability of Project Polytechnics**

State	Cumulative IRG 2001-2006 (in Million Rupees)	IRG 2006-07 (in Million Rupees) (A)	Budget Estimate (Recurring) 2006 (in Million Rupees) (B)	Share of IRG in total Budget 2006 (A) / (B)	Share of IRG in total Budget 2001
Andaman & Nicobar Islands	17.41	2.2	41.1	5.4%	2.8%
Arunachal Pradesh	18.26	0.6	41.7	1.5%	-
Jammu & Kashmir	23.86	0.32			-
Meghalaya	1.8	1.8	46.2	3.9%	-
Mizoram	3.5	0.4	21.7	1.8%	0.5%
Nagaland	5.32	1.1	205.3	0.5%	0.2%
Sikkim	35.46	11.3	24.0	46.9%	31.4%
Tripura	0.31	0.1	8.4	1.3%	1.4%

Sources: (a) Third Technician Education Project, Review Report May-June 2007, National Project Implementation Unit, Government of India; (b) State reports; \*Cumulative IRG for all project polytechnics in the state

3.17. Given the relatively small share of IRG, the onus for sustainability will be on budget expenditures. Gradually over the project period State governments have assumed the increasing recurrent costs associated with the expansion of technician education. There is therefore no transition in funding of recurrent costs from project funding to regular budget funding. Budgeted resources to pay for salaries and minor maintenance will be forthcoming from the state; while institutions will use their internal revenues mostly for development expenditure. However, larger costs related to replacement and medium-term maintenance are not included in the budgets, as discussed in the main text. For project sustainability, project states have drawn up strategic action plans spanning the five years 2007-2012. If the developmental benefits of the project are to be maintained, continued fiscal support to the polytechnics will be a pre-requisite. The respective governments of the project states have asserted their continued commitment, which have been confirmed by the budget allocations for fiscal year 2007/08.

## Annex 4. Bank Lending and Implementation Support/Supervision Processes

### (a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
<b>Lending</b>			
Shashi K. Shrivastava	Sr. Education Specialist	SASHD	Task Team Leader
Sajitha Bashir	Sr. Economist	SASHD	HD Economist
Vandana Sipahimalani	Economist	SASHD	Economist
C. S. Jha	Consultant	SASHD	Technical Education Specialist
S. A. A. Alvi	Consultant	SASHD	Implementation Specialist
Rajiv Aggarwal	Consultant	SASHD	Architect
R. K. Dixit	Consultant	SASHD	Technical Education
Santhanam Krishnan	Sr. Procurement Specialist	SARPS	Procurement Engineer
Rajat Narula	Sr. FM Specialist	SARFM	FM
Edward Heneveld	Education Team Leader	SASHD	Team Leader
Lauritz Holm-Nielsen	Principal Education Specialist	HDNED	Peer Reviewer
Richard Cambridge	Lead Specialist	AFTQK	Peer Reviewer
Y. Saran	Consultant – Technical Education	SASHD	Technical Education
Sara Gonzalez Flavell	Senior Counsel	LEGSA	Legal issues
<b>Supervision/ICR</b>			
Shashi K. Shrivastava	Sr. Education Specialist	SASHD	Task Team Leader
Sajitha Bashir	Sr. Economist	SASHD	HD Economist
Santhanam Krishnan	Sr. Procurement Engineer	SARPS	Procurement Engineer
Rajiv Aggarwal	Consultant	SASHD	Architect
S. A. A. Alvi	Consultant	SASHD	Implementation Specialist
Sushil Kumar Bahl	Sr. Procurement Specialist	SARPS	Procurement
Andreas Blom	Sr. Education Economist	SASHD	Economist
Debabrata Chakraborti	Sr. Procurement Specialist	SARPS	Procurement
Mam Chand	Sr. Procurement Specialist	SARPS	Procurement
Meera Chatterjee	Sr. Social Development Specialist	SASES	Social Development
Renu Gupta	Program Assistant	SASHD	
Nalin Jena	Operations Officer	SASHD	Co-TTL
Chandra Shekhar Jha	Consultant	SASHD	Technical Education
Tanuj Mathur	Sr. FM Specialist	SARFM	FM
Sangeeta Goyal	Education Economist	SASHD	Economic analysis and M&E (ICR)
Rajat Narula	Sr. FM Specialist	SARFM	FM

**(b) Staff Time and Cost**

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
<b>Lending</b>		
FY98		0.03
FY99		0.13
FY00	40	103.85
FY01	13	29.73
FY02		0.00
FY03		0.00
FY04		0.00
FY05		0.00
FY06		0.00
FY07		0.00
<b>Total:</b>	53	133.74
<b>Supervision/ICR</b>		
FY98		0.00
FY99		0.00
FY00		0.00
FY01	23	53.73
FY02	26	60.54
FY03	16	49.35
FY04	20	90.65
FY05	18	92.57
FY06	21	99.28
FY07	19	105.50
<b>Total:</b>	143	551.62

## Annex 5. Beneficiary Survey Results

5.1. Two surveys were carried out to gain insight into the design, implementation, and impact of the project. One set of surveys focused on retrieving feedback from the main beneficiaries of the project: the students. Another survey undertaken by the ICR team sought feedback from federal and state government officials.

### Beneficiary Survey of Beneficiaries

5.2. The Impact Study carried by four NITTTRs (National Institutes of Technical Teachers' Training and Research) surveyed beneficiaries from all seven states/UT. The following tables summarize the response from pass-out students (graduates), final year students, and faculty.

**Table 8 Perception of Pass Outs (Graduates)**

	Fully Agree %	Partially Agree %	Do Not Agree at all %	Not Applicable %
<b>Extent of utilization of:</b>				
Knowledge acquired during diploma program	<b>56</b>	38	6	0
Practical Skills acquired during diploma program	36	<b>53</b>	10	1
Planning and management skills	36	<b>49</b>	12	3
Problem solving ability	<b>48</b>	35	10	7
Communication skills	<b>56</b>	38	2	4
Ability to create and design	33	<b>47</b>	15	5
Interpersonal Relationships	<b>69</b>	24	6	1
Ability to work in Teams	<b>71</b>	25	4	1
Time management	<b>68</b>	19	6	7
<b>Curriculum and Instructional Processes:</b>				
The course includes latest technical developments in the field	45	<b>46</b>	9	
Course schedule was adhered to by teachers	<b>56</b>	36	8	
Laboratories and workshop experiments were conducted as per syllabus	<b>63</b>	33	4	
Teacher's communication was effective	<b>69</b>	28	3	
Audio visual aids were used in instruction	38	34	<b>28</b>	
Use of audio-visual aids helped in understanding the subject matter	<b>46</b>	29	<b>25</b>	
Opportunities were given to ask questions and clarify doubts	<b>66</b>	29	5	
Teachers possess adequate knowledge of subject matter	<b>65</b>	30	5	
Laboratory/workshop staff are proficient in their work	<b>63</b>	28	9	
Library is equipped with latest books	<b>59</b>	35	6	
There were adequate number of subject related books	43	<b>48</b>	9	
Industry personnel were involved in instructional processes	35	35	<b>30</b>	
Computer facility was adequate for independent learning and practice	<b>59</b>	24	17	
Projects undertaken were live problems of industry	<b>46</b>	37	17	
Examinations were conducted as per schedule	<b>64</b>	24	12	
Results were declared on time	<b>57</b>	29	14	

**Table 9 Perception of Final year students**

	Fully Agree %	Partially Agree %	Do Not Agree at all %
The course includes latest technical developments in the field	<b>58</b>	38	4
Course schedule is adhered to by teachers	<b>53</b>	42	5
Laboratories and workshop experiment are conducted as per syllabus	<b>71</b>	24	5
Teacher's communication is effective	<b>68</b>	26	6
Audio visual aids are used in instruction	41	34	<u>25</u>
Use of audio-visual aids helped in understanding the subject matter	<b>50</b>	22	<u>28</u>
Opportunities are given to ask questions and clarify doubts	<b>80</b>	17	3
Teachers possess adequate knowledge of subject matter	<b>59</b>	32	9
Laboratory/workshop staff are proficient in their work	<b>53</b>	39	8
Library is equipped with latest books	41	41	18
There are adequate number of subject related books	33	<b>52</b>	15
Industry personnel are involved in instructional processes	26	34	<u>40</u>
Computer facility is adequate for independent learning and practice	<b>54</b>	32	14
Projects undertaken are live problems of industry	33	38	<u>29</u>
Examinations are conducted as per schedule	<b>70</b>	18	12
Results are declared on time	28	41	<u>31</u>
The course includes latest technical developments in the field	<b>58</b>	38	4
Course schedule is adhered to by teachers	<b>53</b>	42	5

**Table 10 Perception of Faculty**

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
Enhanced capacity has been able to provide equal opportunities of technical education to various sections of society	35	<b>63</b>	2	0	0
Newly established institutions have been able to cater to the needs of the local people	23	<b>59</b>	15	3	0
Curricula designed on multi-point entry and credit system enabled to cater to the individual needs of students	12	<b>65</b>	10	2	11
Tailor made courses could be offered by the institutions	22	<b>61</b>	10	6	1
The attitude of industry personnel towards polytechnic pass-outs have become more favourable	23	<b>52</b>	14	10	1
Industry readily offers assistance for institutional activities	12	49	18	<u>21</u>	0
Teachers are able to cater to individual needs of students through the use of learning resources (print and non-print materials)	33	<b>58</b>	5	4	0
Teachers' task has become easy due to the availability of a large number of learning resources	34	<b>55</b>	3	8	0
Learning resources motivate students for learning	45	<b>50</b>	2	3	0
Teachers are motivated to teach in congenial physical environment	25	<b>64</b>	7	3	1
Learning environment has become more conducive.	26	<b>64</b>	7	3	0
Adequate opportunities for practice are provided to students for development of skills	34	<b>56</b>	3	7	0
The institutions look much more cleaner than before	43	46	6	3	2
As a result of staff development (greater justice with their profession) professionalism among teachers has increased	22	<b>54</b>	10	10	4
Teachers have started taking new initiatives to improve the quality of instruction	29	<b>59</b>	8	3	1
Establishment of III cells have brought industry institute closer to each other	10	<b>54</b>	27	6	3
Establishment of staff development cells led to realistic staff development plans	12	<b>53</b>	17	12	6
Establishment of LRUCs have led to integration of media in teaching-learning	24	<b>60</b>	12	3	1
Industry eagerly wait to organize campus interviews	7	30	27	<u>28</u>	8
Autonomy has enabled the institutions to respond quickly to changing environment	8	<b>45</b>	31	12	4
Greater professionalism in undertaking various activities have resulted on account of autonomy	7	<b>45</b>	33	10	5
The work culture has changed with improved facilities	32	<b>60</b>	4	3	1
As a result of newly established structures at the directorate level, decisions are taken faster	10	32	33	18	7
Examination system has improved as a result of autonomy to the Board	6	<b>55</b>	19	15	5
Autonomous Board is able to declare results on time	8	<b>58</b>	16	17	1
Available resources are now more judiciously utilized.	16	<b>66</b>	10	7	1

5.3. The responses from graduates, final students and faculty are consistent and suggest: (i) Strong utilization and satisfaction with new equipment, laboratories, and learning material, (ii) curriculum, syllabus, course schedule are adhered too, (iii) quality, knowledge and effectiveness



of teachers, laboratory staff, and teaching are adequate and satisfactory, (iv) Relation to industry (interviews, industry involvement in teaching etc) is good, but requires efforts and can become better.

5.4. The NITTTRs equally surveyed employers in all states. Results are summarized as follows: (i) Employers generally rate the graduates as possessing adequate technical knowledge, good to excellent competencies in handling equipment and machinery, (ii) very satisfied with personal/soft skills, including communication, punctuality, team work, ability and willingness to learn, and management skills, (iii) In the state of Sikkim (the only state with results reported on this question), 80-90 percent of employers reported a substantial improvement in the skills and knowledge of the graduates, and (iv) employers suggest to further incorporate project related teaching and field exposure.

### Feedback Survey of Government and Institutions

5.5. A second survey focused on feedback from the high level officials regarding the main institutions involved in the project (federal and state government, The World Bank and Consultants involved in the project. The feedback provides the involved institutions an opportunity to assess impact of project, the risks to sustainability, and improve each institution's performance. The ICR team asked feedback from MHRD, NPIU, State secretaries, Heads of SPIUs, and Principals of the polytechnics (a total of 34 respondents). The survey was carried out via the internet. Each respondent and answer was anonymous. The survey received an acceptable response rate of 56 percent (19 responses out of 34), which implies that the results should be reasonably representative.

**Table 11 Results of Feedback Survey**

Question		Average Rating on a scale from one to ten
<b>Overall impact</b> (Please rate how much you agree with the following statements, 1 meaning you strongly disagree, 10 meaning you strongly agree).		
The project helped the polytechnics meet the specific economic needs of my state/UT		8.3
The project provided my state/UT with demanded technicians for economic development		8.8
The project increased access of women, ST/SC, minorities, and rural youth to technician education and training		9.2
The project increased state/UT capacity to implement academic and policy reforms		8.3
The project increased supply of technician services to industry in my state/UT		8.9
The project improved quality of technician (polytechnic) education		9.3
The project improved efficiency of technician education (in terms of unit costs, utilization, and drop out)		9.1
The project improved the quality of technician education		9.3
The project improved the teaching of soft skills		8.8
The project improved the availability of equipment and learning resources		8.8
Please identify which one of the areas listed below you regard as <b>the greatest impact of the project</b> . Then please identify which one you regard as the second greatest impact of the project.		
Granting of autonomy and IRG policies	Greatest Impact: 22%	Second Greatest Impact: 0
Expansion of capacity (seats)	6%	0%
Increased efficiency and higher placement rates	0%	35%
Increased interest and demand for technician education	61%	6%
Increased enrolment of women, rural youth, and SC/ST	0%	12%
Increased interaction with industry and society	0%	24%
Upgrade of the equipment and learning resources	6%	12%
Better faculty and staff through hires and training	0%	0%
New programs and revised curricula	6%	0%
Political attention to technician education	0%	12%
The project had no important impacts	0%	0%
Please rate on a 1 to 10 scale, the <b>risk to sustainability of the project's achievements and impacts</b> (1 being very high risk, 10 being very low risk).		Average Rating on a scale from one to ten

State governments will not adequately fund faculty and maintenance costs	6.7
The remaining civil works, if any, will not be completed	8.6
Limited demand in the participating states/UT for graduates from technician education	7.9
The government will not respect the increased autonomy of the polytechnics	7.4
The polytechnics will not make effective use of the increased autonomy	8.7
The polytechnics will not further develop in the future	8.2
Programs and curricula will not be revised according to future labor market demands	8.8
Institutions will not be able to generate sufficient IRG	7.1
<b>On a scale from 1 to 10, please rate how favorable your impression of the Joint Review Missions were</b>	
Overall importance for successful implementation	8.9
Advice on education planning and policymaking	8.7
Sharing of experiences and learning best practices	9.1
Motivation for implementation	9.3
Guidance on procedures and rules for implementation	9.4
Planning and budgeting implementation	9.1
Participation of high level officials (secretaries and principal secretaries)	8.7
<b>Please rate on a 1 to 10 scale, the work of the National Project Implementation Unit (NPIU) to assist your state</b>	
Overall performance	8.7
Provision of timely and adequate information	8.4
Responsiveness to inquiries	8.6
Educational and academic advice for implementation	9.0
Support for implementation in terms of procedures, rules and budgeting	8.8
<b>Please rate on a 1 to ten scale the work of the Procurement consultants contracted to assist your state</b>	
Overall performance	6.4
Helpfulness in implementation from project initiation to mid-term review	5.9
Helpfulness in implementation after project mid-term	6.3
Timeliness and responsiveness in service	6.1
The quality of work compared to the price	6.0
<b>Please rate on a 1 to 10 scale the work of the Academic consultants contracted to assist your state?</b>	
Overall performance	7.9
Quality and relevance of educational and academic advice	7.9
Helpfulness in implementation	7.7
Timeliness and responsiveness in service	7.3
Quality of work compared to the price	7.6
<b>Please rate the quality of the available choice of consultants at project initiation?</b>	
Quality of available choice of all consultants (procurement, academic and others)	Satisfactory or highly sat. 67%
Quality of available choice of Procurement consultants	47%
Quality of available choice of Academic consultants	80%
<b>Please rate on a 1 to 10 scale, the contribution of the States/UT government to the project (1 being very unfavorable, 10 being very favorable).</b>	
Overall facilitation of project implementation	<b>Average Rating on a scale from one to ten</b> 7.9
Careful monitoring of implementation	7.2
Approval and adherence to autonomy and IRG policies	6.4
Timeliness of administrative decision for implementation of autonomy and IRG policies	6.3
Creation of the necessary positions for the Polytechnics and SPIUs,	7.4
Timely and available budget funds	7.6
Approval of training of faculty and staff	8.6
<b>Please rate on a 1 to 10 scale, the work of the World Bank in the project</b>	
Overall facilitation of project implementation	8.5
Educational and academic support (Quality, relevance and timeliness)	7.9
Architectural and construction support (Quality, relevance and timeliness)	8.3
Support with procurement (Quality, relevance and timeliness)	8.2
Support with financial management (Quality, relevance and timeliness)	8.6

Source: World Bank Technician Education III project Client Survey

5.6. In addition, the survey sought feedback on the Bank team's performance from questions drawn from the Bank's 2004 India Client Survey, which reflected the World Bank's work overall in India. Although questions are exactly the same, there may not be full comparability, because the Project Survey sought feedback from federal government, state governments, and academia, while the all India survey included in addition to the three above a large share of respondents from media (31 percent) and Civil Society (11 percent).

**Table 12 World Bank Team Performance in Comparison to India Client Survey 2004**

Based upon your experience from this project, please rate how much you agree with the following statements (1 meaning you strongly disagree, 10 meaning you strongly agree)	This project	Rating in India Client Survey 2004		
		Areas with recent Bank activity	State govt.	All India
The Bank worked efficiently	9.2	7.11	7.23	6.8
The Bank helped to strengthen institutional capacity	9.5	7.58	7.03	6.9
The Bank and partners in Government collaborated well together	9.1	6.7	6.77	6.6
Overall I liked work/interact with Bank Staff	9.5	7.5	7.25	7.2
The World Bank treated clients and stakeholders with respect	9.5	6.41	6.31	6.3
The Bank's procurement requirements made it difficult to work with the Bank (low is good)	5.1	5.33	5.17	5.2
The Bank played a useful role in reducing corruption, collusion and nepotism in this project	8.3	3.69	4.82	4.3
The Bank imposed reasonable conditions on its lending	9.3	5.86	5.72	5.7
<b>Please identify which one of the areas listed below you regard as the greatest value brought to your state/UT by the World Bank</b>				
a. Providing loans to finance development projects	33%	53%	53%	55%
b. Providing loans to promote policy reforms	0%	17%	16%	14%
c. Technical support (policy advice, training)	<b>60%</b>	8%	15%	12%
d. The Bank's knowledge (studies and analyses)	0%	5%	4%	5%
e. Convener/facilitator (e.g., Government, donor and civil society)	0%	0%	1%	5%
f. Donor coordination	0%	3%	2%	4%
g. Ability to mobilize resources for development work	0%	1%	3%	2%
h. Other	0%	4%	2%	2%
i. Ability to build implementation capacity	7%	7%	4%	1%
i. None of the above / the World Bank serves no useful purpose	0%	3%	1%	1%
<b>Please identify which one you regard as the second greatest value brought to your state by the World Bank</b>				
a. Providing loans to finance development projects	13%	9%	7%	21%
b. Providing loans to promote policy reforms	13%	16%	22%	19%
c. Technical support (policy advice, training)	13%	27%	19%	14%
d. The Bank's knowledge (studies and analyses)	7%	9%	12%	13%
e. Convener/facilitator (e.g., Government, donor and civil society)	13%	5%	6%	12%
f. Donor coordination	7%	4%	4%	9%
g. Ability to mobilize resources for development work	13%	13%	18%	6%
h. Other	0%	13%		4%
i. Ability to build implementation capacity	<b>20%</b>	3%	10%	1%
i. None of the above / the World Bank serves no useful purpose	0%	1%	0%	1%
<b>Which one of the following do you identify as the Bank's single greatest weakness in its work in this project?</b>				
Imposing technocratic solutions without regard to political realities	<b>44%</b>	29%	28%	24%
Not exploring alternate policy options	11%	22%	26%	21%
Too bureaucratic in its operational policies and procedures	0%	22%	25%	20%
Staff too inaccessible	11%	1%	2%	15%
Too small a player relative to India's economy	22%	10%	9%	14%
Is arrogant in its approach	0%	4%	4%	3%
Too influenced by the US	11%	11%	8%	3%

## **Annex 6. Stakeholder Workshop Report and Results**

6.1. The Government and the Bank organized two workshops for the preparations of this report. The first workshop in June, 2007, was organized as part of the 12th Joint Review Mission with the participation of all state/UT governments. Further, this workshop involved interviews with students, graduates, faculty, principals, and employers in three institutions in Sikkim and Tripura. A second workshop was held in October, 2007 to discuss the state implementation and results completion reports, and the draft Bank and Government implementation and results completion reports.

## Annex 7. Borrower's ICR

### A. PROJECT OBJECTIVES AND CONCEPT

7.1. The Third Technician Education Project, conceived during 1999 became effective in January 2001. It was directed towards developing polytechnics in the States/Union Territory (UT) of Andaman and Nicobar Islands (A & N), Arunachal Pradesh, Jammu and Kashmir (J & K), Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The Project provided a special focus in these States and UT towards capacity building of polytechnics, enabling them to enhance their roles, improve their performance, and produce competent technician manpower.

7.2. The targeted States and UT are remote and span the borders of the country. Most of these areas possess a hilly terrain, are of comparatively low population density, with a predominantly tribal populace. Access and communication channels with the country's mainland were weak in the pre-Project period, though they have improved of late. The targeted States were unable to fully utilize the opportunities and development scope emerging from the economic reforms undertaken by the Government of India during the last few years of the Twentieth Century. One major reason for this inability was the inadequate availability of relevant technical manpower, which could be productive and could utilize the rich natural resources that abound in the Project area. It was this reason that created a need for this Project.

7.3. The Technician education infrastructure that existed in the targeted States / UT in 1999 - 2000 is shown in the Table given below:

States / UT	No. of Polytechnics	Annual Intake
Andaman & Nicobar (A & N) Islands	2	155
Arunachal Pradesh	0	0
Jammu & Kashmir (J & K)	4	560
Meghalaya	1	150
Mizoram	2	150
Nagaland	2	75
Sikkim	0	0
Tripura	1	120
<b>Total</b>	<b>12</b>	<b>1210</b>

7.4. The average intake per Polytechnic in these States and UT was significantly lower than the national average of 174 students (Reference: Annexure – G ISTE Handbook 2001). Courses offered were conventional, the institutions were under-staffed, and their physical resources either obsolete or inadequate. In the context of the development of these pockets of the country, the polytechnics needed urgent and serious attention, which the conceived Project was designed to provide.

7.5. A significant number of benefits were expected from the Project to the targeted States and UT. Among them were:

- Provide proper educational engagement and specialized preparation for employment for secondary school leavers and ensure that their talents are directed towards productive activities,
- Augment the earning capacity of unemployed youth and school dropouts through non-formal technical training,

- With the availability of ample and competent technical manpower, generate a climate conducive for investments by industry and business and for the establishment of entrepreneurial ventures,
- Accelerate the advent of new technologies and consequent benefits in terms of industrial products and productivity, and
- Use the technician pass outs to improve public services, networking among Polytechnics within the Project States and UT, and, increase efficiency and accelerate workflow in State and local administration.

7.6. The direct beneficiaries from the Project were to be youth (both school pass outs, unemployed school dropouts from rural and tribal areas), potential entrepreneurs, and prospective investors, industrial and field workers, apart from the state administration. The empowerment of youth was expected to benefit young women through improved gender equity and women employment in technical vocations. In a similar manner, other sections of the disadvantaged population were also expected to gain from the Project. Long-term benefits were anticipated in terms of economic security for a significant proportion of the population.

7.7. The Project was broadly categorized in three components:

***Capacity Development/Expansion*** to be achieved by:

- Establishing six new co-educational polytechnics and a skills development center with courses in new and emerging technologies,
- Strengthening twelve existing polytechnics and introducing new programs, and enhancing intake,
- Introducing continuing education and non-formal training programs for industry and community, and
- Improving student and faculty housing facilities.

***Quality Enhancement*** to be achieved by:

- Developing/revising curricula to meet current and future labor market needs as well as imparting entrepreneurial skills,
- Modernizing existing laboratories and workshops,
- Improving staffing and imparting need based faculty and staff training,
- Augmenting the variety and increasing utilization of learning resources and media,
- Adopting better teaching and learning practices, and
- Promoting interaction with industry and community.

***Efficiency Improvement*** to be achieved by:

- Establishing/strengthening state boards/councils/directorates and other support units dealing with technician education to provide better planning, monitoring and guidance,
- Conducting research studies for systemic reforms,
- Instituting computer-based Project and financial management systems,
- Providing substantial academic, financial, managerial and administrative autonomy with accountability to Project Polytechnics,
- Introducing Training & Placement services for students,
- Networking of polytechnics with other institutions/organizations, and
- Enhancing state-level policy support for technician education.

7.8. The Project design incorporated specific targets and indicators to profile the intentions mentioned above into a measurable and observable frame. The indicators were drawn from the experiences of two earlier Technician Education Projects. The indicators were used as

‘achievement drivers’ in Project implementation and as benchmarks in monitoring. The Annexure - 1 depicts the targets and status of their achievements.

## **B. ACHIEVEMENT OF PROJECT OBJECTIVES**

### ***Capacity Development/Expansion***

#### ***Existing Polytechnics***

7.9. The infrastructure in all the 12 existing polytechnics was strengthened in all aspects of component one i.e. Capacity Development/Expansion.

#### ***New Polytechnics***

7.10. During Project initiation, 6 new polytechnics, (one each in Arunachal Pradesh and Nagaland and 2 each in Meghalaya and Sikkim) had been planned and approved. Subsequently, on request, 3 more new polytechnics (2 in Jammu & Kashmir and 1 in Tripura) were added. These 9 new polytechnics made access to technician education much easier to the local population and established centers for the diffusion of technologies to all inhabited but comparatively backward corners of the targeted States.

7.11. All these new polytechnics have become functional and are admitting students on a regular basis.

#### ***New Programs Introduced***

7.12. The original target for starting new courses was 52, 45 diploma and 7 post diploma. During the Mid Term Review and subsequent period, due to poor response/necessity to meet demand of local aspirations the target of new courses were revised to 60, 57 diploma and 3 post diploma. The new post diploma courses started were Marine Engineering, Deck Cadet in the UT of Andaman & Nicobar Islands and Information Technology in Meghalaya. All the new courses were designed to cater to both current technical manpower inadequacies and future needs related to the proposed developments in the next two five-year Plans of the States and aligned to ongoing technological advancements in the rest of the country.

7.13. The new courses introduced included : Information Technology, Electronics & Hardware Maintenance, Computer Science & Engineering, Tool & Die Making, Manufacturing Technology, Automobile Engineering, Marine Engineering, Deck Cadet Course, Textile Design, Fashion Technology, Food Technology, Wood Technology, Leather Technology, Instrumentation & Control, Medical Electronics, Medical Laboratory Technology, Hotel Management & Catering Technology, Travel & Tourism, Herbal Remedies & Cosmetology, most of which were new technologies for the targeted area.

7.14. The selection of courses was aligned to the specific functional and economic needs of the States and UT. For example, Costume Design & Garment Technology and Textile Design courses would assist the Handloom and Knitwear industries in Jammu & Kashmir and Meghalaya. With the growth of tourism and the hospitality industry, many of the targeted States and UT needed courses to man these industries. In general, the more popular choices related to Information Technology, Electronics & Telecommunication Engineering and Computer Engineering, which were vital for internal and external connectivity. Course relevance was a feature in the Project.

#### ***Sanctioned Intake and Enrolment***

7.15. A total of 5503 seats were created during the Project as compared to 3630 seats available in the pre-Project period making the total seats available to 9133. The increase in seats, the availability of emerging technology courses, the initiation of placement for employment activity, the enhanced interest of industry in the academic processes of the polytechnics, and the improved physical infrastructure resulted in an increase in public interest in Technician Education. The early indicators of this impact were the gradual increase in the annual enrollment in polytechnics.

Enrolment in all States and UT has increased during the Project period to about 85% of the sanctioned intake capacity. The enrolment of students increased from 419 during pre-project stage to 3190 at the end of the Project in Jammu & Kashmir which is 98% of the sanctioned strength which represents a remarkable achievement in the State. It is expected that, within the next few years, as information about these developments gets diffused, student enrollment will further increase to fill all sanctioned intake in the Project States and UT, and, probably, put pressure on the state systems to enhance intake further.

7.16. Enrolment of students from socially disadvantaged groups also registered a fairly steep increase. The percentage of women enrolment rose steeply in all States, and in some cases even up to 60% of the coed polytechnic intake (Mizoram). Tripura, in the course of the Project, with due approval of target revisions, established an exclusive polytechnic for women. This constituted a significant impact factor for the Project. The enrolment of women increased from 31.5% (pre-project) to 38.4% at end of Project. In terms of numbers of women students, the enhancement was from 488 to 2988. The UT of Andaman & Nicobar Islands and Tripura have achieved their Project targets. The promising outlook Projected by the polytechnics and government policy initiatives acted as drivers for this achievement.

7.17. Enrolment of SC/ST students registered considerable increases in all Project areas, except in the UT of Andaman & Nicobar Islands, where the targets in any case was low, due to the incidence of a migrant population from the mainland and the scattered and abnormally backward nature of most of the islands. All other States provided positive indicators of student enrolment, even to the extent of exceeding Project targets. The States of Arunachal Pradesh, Meghalaya and Nagaland have exceeded their targets.

7.18. Wide publicity of courses through local newspapers, local news bulletin, Polytechnic websites and campaign in local schools including outside the State as in Sikkim, local cable network, brochures etc. were the contributing factors for increase in the enrolment including that of women.

7.19. The predominant rural and hilly locations of the Project territory supported access to rural students to the Project Institutions. Construction of hostels, providing sufficient seats for men and women, encouraged the enrolment of students as in the case of other categories of disadvantaged students. Achievement exceeded targets in the States/UT of Andaman & Nicobar Islands, Arunachal Pradesh, Jammu & Kashmir, Nagaland and Sikkim.

#### ***Continuing Education and Non-formal Training Programs for Industry and Community***

7.20. New cells to promote Continuing Education, Industry Institute and Community Interaction were established in each Project Polytechnic. These cells were provided with adequate resources to fulfill role expectations and targets. The Project Polytechnics have offered 63 long term and 1257 short term programmes benefiting 5143 persons from industry and 18032 community members excluding beneficiaries from the Community Polytechnic scheme. All States/UT have exceeded the target for offering number of Continuing Education Programmes.

#### ***Improving student and faculty housing facilities***

7.21. During the Project, residential facilities for about 1065 men students and 1252 women students were created in the targeted polytechnics. This acted as a feature of attraction for students from a poor background and from distant locations. This probably acted as a reason for the enhanced women enrollment. A total of 298 additional faculty and staff residences have been created in the polytechnics.



## ***Quality Enhancement***

### ***Modernizing existing laboratories and workshops***

7.22. 143 existing laboratories & workshops were modernized and 221 new laboratories & workshops setup in Project Polytechnics. The Project target was exceeded on this issue. All the procured equipments were curriculum relevant. The States and UT setup maintenance cells in each of the 21 existing Polytechnics to ensure that most equipment received preventive and corrective maintenance care within the polytechnic itself.

7.23. Twenty new Computer Centers were established. Requisite software and peripherals were also acquired. The drive for making all students computer proficient was a key impact factor in this Project and this was achieved through modernized curricula and improved computing facilities. Improved computer facilities also motivated faculty members to use computers as an aid to media development and student instruction.

7.24. Internet facilities were introduced in all Project Polytechnics and helped enhance their connectivity with leading institutions in the country. Student access to technical information increased with easy access to the Internet.

### ***Developing/revising curricula***

7.25. Each State established mechanisms to revise and develop curricula. The four NITTTRs and NTTF associated with the polytechnics, and the network institutions provided guidance in curricula development and subsequent implementation.

7.26. The diploma courses in the existing 12 polytechnics in the Project States and UT at the start of the Project were of the conventional or core type and were more or less a duplication of courses existing in other States at the pre-Project stage. All existing curricula were revised and curricula for new courses designed with the assistance of consultants (the four NITTTRs and NTTF networked or partnership institutions). The UT of Andaman & Nicobar Islands obtained strong support from Maritime Training Institute, Mumbai for 2 years and later from Indian Institute of Port Management, Kolkata for their Marine Engineering courses. In the revision and design of curricula, involvement of industry was ensured. Learning experiences to develop skills needed by technicians to perform in the shop floor or field were included in curricula. Soft and general skills like communication, entrepreneurship and managing people at work also found a place in curricula.

7.27. An important innovation in course reform was the introduction of course flexibility through Multi Point Entry and Credit System (MPE&CS). This reform promotes student learning at his/her own pace and the choice of a variety of specialization options. Further, the exam system becomes more valid and reliable since it would be credit based rather than marks based. Most of the polytechnic courses (80) were reframed to incorporate this reform, with the assistance of the associated four NITTTRs and NTTF.

### ***Improving staffing and imparting need based faculty and staff training***

7.28. The existing faculty vacancies during the pre-project stage were 348. Out of this, 322 (93%) were filled by the end of the Project. Against a target of 354 key additional faculty positions, 252 (71%) were filled. Steps have been taken by the Project States/UT to fill up the remaining posts. The faculty student ratio was 1:13.6 (Refer Annexure 5 - Fig. 2). 33% of the total faculty recruited (existing and new) were women.

7.29. Out of 652 staff sanctioned, 433 were filled (66%). Against a target of 408, key additional staff positions, 238 (58%) staff position were filled. 38% of the staff recruited for existing and new vacancies was women.

7.30. To help faculty development Training Need Assessment (TNA) workshops were conducted for all Project States and UT by the four NITTTRs and NTTF associated with them. The TNA provided a basis for the design and implementation of faculty and staff development. In addition, the NPIU with technical assistance from World Bank conducted a number of workshops for Project planning, budgeting, reporting, financial management, and other key procedures.

7.31. The Project was expected to support training of all (550) faculty during the Project period (at an average of 4 weeks per year) through local and foreign training/fellowships. Teacher training in the areas of curriculum development, education technology, instructional resources design and technological content updating of almost all teachers was to be carried out with the assistance of NITTTRs and NTTF and other agencies selected by the States. Some 90 teachers and officials were proposed to be trained abroad to increase their competence in planning, organizing and managing the system. About 250 teachers were expected to be trained in Indian industries in new technology areas for making instructional processes more relevant and increasing industry-institution interaction. The Project also supported the training of about 500 laboratory and workshop staff.

7.32. 560 (new and existing) faculty members were trained for a total period of 1955 person months against a target of 573 and 2777 respectively. Faculty training was primarily meant to develop skills related to classroom and laboratory instruction, development of institutional and learning resources, management of institutions, practices to promote interaction with industry and community and on Project management and related elements. The development programs and workshops were either in-house or at State headquarters or in suitable locations out side the State.

7.33. In addition 4 local study tours were conducted within the country to expose the faculty to the best teaching practices and advance laboratories & workshops facilities. Study tour for 14 Senior Administrators was organized in April 2003 to Germany. A Fellowship program for 39 participants in Germany was also organized.

7.34. 500 staff was trained for a period of 631 person months against a target of 596 persons and 1463 person months.

***Augmenting the variety and increasing utilization of learning resources and media***

7.35. The polytechnics increased their stock of the Learning Resources (LRs) through two initiatives. The first was to procure readymade LR's like multimedia/CAI packages, OHP transparencies, learning packages, models, laboratory manuals and video programs from the NITTTRs, NTTF, other leading institutions and private sources. The second and more challenging initiative was to develop them in-house after acquiring skills to do so. Teachers were motivated to use media extensively. 2430 learning packages, 826 models, 889 lab manuals, 1889 video programmes, 1606 multi media packages were procured and put to use. In library, books are adequate as per AICTE norms in all Project Polytechnics. The result was that the quality of instruction improved to a large extent in the Project Polytechnics, as reported in the Impact Study.

***Adopting better teaching and learning practices***

7.36. The faculty development programmes enabled Project institutions to utilize LR's effectively in the classroom and laboratory. In fact, the learning methods employed in the institutions became wide reaching. A practice requiring considerable student endeavor was Project work, which provided opportunities for students to develop practical and problem solving skills. One more interesting development was to motivate students to use the Internet as a multidimensional LR. This practice became fairly universal among students in the Project Polytechnics. The use of modern methods and learning resources like audio visual aids, manuals, models, video programmes etc. improved the teaching learning process substantially.

7.37. The net impact of these measures can be gauged by the enhancement in enrolment, the increase in pass rate and employability of the pass outs. Student learning did benefit in all respects through the adoption of better practices in teaching and learning.

7.38. Average pass rate in first attempt has improved for all States/UT and averages 88% towards the end of the Project period, while student drop out rate has declined in almost all States.

***Promoting interaction with industry and community and networking with leading institutions in other States***

7.39. In spite of the very few industries in the neighborhood of institutions, interaction with industry was promoted through innovative models. One major model involved using the network with other resource institutions to benefit academically from industry. To illustrate, the UT of Andaman & Nicobar Islands had networked with 3 institutions in Maharashtra including Maritime Training Institute in Mumbai. Arunachal Pradesh established strong links with similar discipline groups in North Eastern Regional Institute of Science and Technology (NERIST) at Itanagar. Mizoram networked with institutes in Maharashtra for developing Communication Technology programs. Meghalaya established links with Industrial Development Corporation, private horticulture and other industrial estates in the State. Nagaland and Tripura sought assistance from National Institute of Fashion Technology, Kolkata for the courses run by them. Nettur Technical Training Foundation (NTTF), Bangalore in addition to assisting Sikkim also contributed in running specific programmes and visits for other Project Polytechnics. MOUs with these partners enhanced industrial access in nearby regions for Project Polytechnics and also enabled useful faculty exchanges. Benefits to Project Polytechnics occurred in terms of student training and Projects, exposure to industrial practices, availability of industrial experts for teacher and faculty and staff development. Most Polytechnics have made industrial training compulsory for students for a period of 4 – 6 weeks. The enduring gain from this partnership approach was in the opportunities generated for student employment.

7.40. Project Polytechnics, in the course of the Project, trained more than 18000 youth from the community. This scale of achievement is remarkable and exceeds Project targets and expectations. The main approach was through 1257 short-term programs (and a few long term programs) and building strong and mutually supportive relationships with community. The intentions of the programs were transfer of utilitarian rural technologies and consequent income generation, entrepreneurial practices and measures to improve the availability of potable drinking water and sanitation.

7.41. In addition, the continuing education efforts resulted in relevant training of 5143 industrial workers. During Tsunami, the communication system in the UT of Andaman & Nicobar Islands depended entirely on the V-sat system of the UT of Andaman & Nicobar Islands Polytechnics. The Polytechnic students/faculty members/staff provided the following services:

- The extension centers provided the essential communication services for rescue operations etc.,
- The communication system of the Islands was restored by the officials in record time,
- Completed the task of preparing the list of affected personnel through modern systems of photo identification etc., and
- Provided food and other essentials for nearly a month to the affected persons.

***Efficiency Improvement***

***Establishing/strengthening state boards/councils/directorates and other support units***

7.42. Sikkim has established a State Board of Technical Education. Arunachal Pradesh created a Technical section in the Directorate of Higher and Technical Education. Jammu & Kashmir,

Meghalaya, Mizoram and Nagaland have strengthened their State Directorate of Technical Education. The UT of Andaman & Nicobar Islands affiliated its Polytechnics first to Delhi Technical Education Board. The UT then got the affiliation to Maharashtra Technical Education Board to have academic autonomy. Subsequently, the UT has got de-affiliation from the Maharashtra Technical Education Board and set up an independent society for the Polytechnics. The Polytechnic in Tripura was affiliated to the West Bengal Technical Education Board. In order to have better academic autonomy, the affiliation has now been shifted to Tripura University.

***Conducting research studies for systemic reforms***

7.43. Research Studies were conducted during the course of the Project period on various issues related to strategy design, Project implementation and outcomes. Studies were conducted to promote women participation, resource generation through transfer and greater societal interaction, Continuing Education and Multi Point Entry and Credit System (MPE&CS). The findings of these research studies were used by four NITTTRs, NTTF, State Governments and NPIU to improve or introduce remedial measures and for new initiatives. A study on Utilization of Resources created under the Project was conducted. A Study on the Assessment of Impact of the Project was also conducted by the NITTTRs.

***Instituting computer-based Project and financial management systems***

7.44. The managing of Project finances was computerized in all Project Polytechnics in the course of the Project. Networking of each SPIU with Project Polytechnics enabled the compilation of financial data to occur smoothly. SPIUs were strengthened with adequate computer facilities and necessary software. Financial reporting to NPIU occurred on a regular basis.

***Providing substantial academic, financial, managerial and administrative autonomy with accountability to Project Polytechnics***

7.45. All Project States/UT have granted autonomy to Project Polytechnics in varying degrees. Autonomy in all dimensions has been granted to newly established polytechnics in Arunachal Pradesh and Meghalaya. Full academic and managerial autonomy has been provided to polytechnics in Andaman and Nicobar, Mizoram, Sikkim and Tripura and limited autonomy has been provided to polytechnics of Jammu & Kashmir and Nagaland for financial and administrative purposes. However, considering the novelty of this Project for the benefiting States and UT, the grant of autonomy has to be acknowledged as a bold measure, since even developed States were hesitant to take this step in the earlier Technician Education Projects.

***Introducing Training & Placement services for students***

7.46. Student training in industry registered an increase during the Project due to additional opportunities created by the networked / partner institutions of Project Polytechnics.

7.47. Training and Placement services were managed through cells created in each Project Polytechnic. Campus interviews were organized periodically and resulted in the selection of about 1430 students in the year 2006-07. The training in entrepreneurship introduced in Project Polytechnics acted as a stimulus for entrepreneurial ventures by pass outs.

7.48. Employers have rated the knowledge, skills and attitudes possessed by the Project Polytechnic graduates from very good to excellent. They desired that more field practice be incorporated in courses to increase pass out quality to still higher levels. The average unit training cost at the end of the Project amounted to Rs 27,400/- The monthly income of placed students varied from a stipend of Rs. 2500 to a salary of Rs. 15000. This factor, along with the enhancement in placement was a significant impact factor. The percentage of pass outs pursuing higher studies has also improved in all States/UT.

### ***Enhancing state-level policy support for technician education***

7.49. State policies for academic reforms, Project procurement and the appointment of consultants, the strengthening of state units, creation of posts and recruitment of faculty and staff, the new procedures and practices in financial management, and networking with other institutions had to be either altered or formulated. Each state responded to this requirement readily in an effort to support Project implementation.

### ***IRG and Cost Recovery***

7.50. The Project Polytechnics generated internal revenue to the tune of Rs. 105.92 million during the Project period through a large number of activities such as consultancy to industry, continuing education, testing of materials, production-cum-training centers, LAN work, vehicle maintenance, lending of institute resources, testing and calibration services, fee from students etc. UT of Andaman & Nicobar Islands, Arunachal Pradesh, Jammu & Kashmir, Mizoram, Nagaland and Sikkim have exceeded their Project targets. Other States achieved close to targets.

### ***Other Achievements***

#### ***Space Availability and Utilization – Civil Works***

7.51. The civil works encompassed extensions to 12 existing polytechnics and construction of 9 new polytechnics, 147 staff quarters, 151 faculty houses, and hostels to create 1065 seats for men and 1252 seats for women students. In addition, renovations and alterations were carried out in several existing buildings. The estimation of space requirements was done as per AICTE norms.

7.52. The approximate unit construction cost in most States was estimated at Rs. 8000-10000 per square meter (about 20% higher than that in most States of India). In the UT of Andaman & Nicobar Islands, the construction cost was expected to be still higher by about 20%. Construction costs are high due to remote locations and difficult terrain of the States; need to transport most construction materials from distant places and the limited number of fair weather days for construction. All civil works were undertaken under NCB, with a procurement specialist agency specially selected to design structures and oversee construction progress.

7.53. Almost all the construction work was completed during the Project period with minor delays. The delays can be attributed to inadequate availability of manpower for construction in some locations, late arrival of materials and normal problems arising in the acquisition of land. The clearance mechanism in some States also took its own time. The only partially completed works are in the two new polytechnics in Jammu & Kashmir, and an auditorium in the UT of Andaman & Nicobar Islands. These works were proposed and approved at very late stages during the Project and were expected to spillover into the post Project period, as has happened. The construction in these three cases is likely to be completed soon with the State funding. In any case, the governments of the state and UT sought and obtained reimbursement only to the extent of work done during the Project period.

7.54. The average utilization factor at State level for classrooms was found to be around 0.5 for different Project Polytechnics towards the end of the Project in a resource utilization study. This by no means can be considered poor, since the actual students intake has yet to equal sanctioned intake. The utilization factor is likely to rise to 0.7 – 0.75 within the next two or three years, which is equal to the national norm (AICTE).

#### ***ISO 9001-2000 Certification***

7.55. Through the efforts of NPIU, an initiative to obtain ISO9001-2000 certification commenced in most States in 2006. BR Ambedkar Polytechnic in Andaman & Nicobar Islands was already ISO9001-2000 certified. NPIU arranged training at Andaman & Nicobar Islands for other Project States and guidance was provided by the UT Polytechnics as well as NPIU. As a

result of the above efforts, 9 Polytechnics viz. Arunachal Pradesh (1), Mizoram (2), Sikkim (2), Meghalaya (3), Nagaland (1) have obtained ISO 9001: 2000 Certification. The Polytechnics in Jammu & Kashmir are in the final stages of obtaining ISO 9001: 2000 Certification and Tripura has been requested to take up this activity. The passouts of the Polytechnics having ISO 9001: 2000 Certification have much to gain by way of recognition of the diploma nationally as well as internationally.

#### ***Technical Vocational Education & Training (TVE&T)***

7.56. Though not initially envisaged, Vocational Education programmes were introduced as pilot programmes of Government of India in the Project Polytechnics, which met with huge success and found more takers than the Polytechnics could handle. The Vocational programmes were offered during off hours using the Polytechnics facilities and resources and only limited outsourcing was done wherever it was found to be absolutely necessary. Most programmes offered were within the expertise and structures available with the Polytechnics. The programmes were modular and competency based and provided certificate at the end of each module. This activity enhanced utilization of resources and provided much needed publicity to the Polytechnics. The total number of persons trained under TVE&T programmes were 3047 through 58 courses conducted during the Project period.

#### ***Full utilization of Project allocation***

7.57. Project allocation of 48.900 million SDRs has been fully utilized. Out of expenditure of Rs 3830.40 million, World Bank has reimbursed Rs 3198.404 million, as per Project Agreement.

### **C. IMPLEMENTATION MECHANISM**

7.58. The implementation mechanisms for the Project included a Polytechnic Project Implementation Unit (PPIU) in each Project institution, a State Project Implementation Unit (SPIU) for each of the beneficiary States and Union Territory, a national coordinating agency or National Project Implementation Unit (NPIU) at New Delhi, and National Project Directorate headed by Joint Secretary (T), in the Department of Higher Education, MHRD, Government of India for making Project related decisions.

7.59. The monitoring and evaluation mechanism were based on the successful models developed during the two preceding Technician Education Projects. These included periodic reviews by State Secretaries, the NPIU and the NPD. The bi-annual joint reviews with State Secretaries, NPIU and SPIU officials, Polytechnic Principals, Government of India and World Bank, covered all aspects of the Project with special focus on achievements in quality components. The targets or benchmarks offered a platform for monitoring Project progress. These reviews included visits to Project Polytechnics and interaction with the students, teachers, employees and community representatives. Problems or bottlenecks identified during monitoring and review were resolved at the polytechnic or state levels or through joint consultation with the NPIU. Occasionally, the advice of the World Bank mission leaders and members were sought. The mid – term review provided an opportunity for mid course evaluation and corrections as needed. The Project also supported relevant research studies on various Project components. A Utilization of Resources Analysis and Impact Study were also conducted in the closing stages of the Project.

### **D. PROJECT SUSTAINABILITY**

7.60. All participating States/UT are keen to sustain the gains that have resulted from the Project. All State Governments/UT have formulated plans assuring budget provisions for recurring expenditure for the next five years. State Governments/UT will also have to consider long term visioning and perspective planning to build on the strengths and opportunities created by this Project. Units, cells and mechanisms created during the Project will continue to function in the future. With state and UT industrial and infrastructural development planned for the future

through special Government of India funding, the manpower generated by the Project Polytechnics will prove to be a constructive resource. This would be the major driver for sustainability.

#### ***Possible Risks and Remedies***

- The Internal Revenue Generated may not match the total financial requirements to sustain institutional operation and development and will only act as a supplement to continued state/UT funding for institutions,
- The Technical Vocational Education & Training scheme for benefiting school dropouts and other youth sections may have to be supported from funds available for other schemes and other government departments in the Project States/UT,
- Faculty/Staff development may not receive adequate impetus as was available during the Project period. The state will have to ensure continuing development through specific policy initiatives,
- Filling up of Faculty vacancies have to be pursued vigorously by States/UT, since faculty turnover (a national phenomenon) is likely,
- Networking among the Polytechnics across the States/UT and with institutions outside the targeted area will have to be strengthened to promote sharing of expertise and resources, and
- The adoption of new technologies suited to the requirements of the Project will be a pressure and opportunity to be anticipated by the Project States and UT. The experience from the Project will serve as an effective preparation for such reforms.

#### **E. BANK PERFORMANCE**

7.61. The Bank task team's contributions during Project conception, design, planning and implementation and their visits to various sites and frequent interaction with central and state government officials have significantly helped in making the Project implementation a success.

7.62. Familiarity with the Indian psyche and the working conditions enabled the World Bank Project team to handle implementation and progress impediments with great understanding and adopt a supportive role. This accelerated clearance of various proposals and Project progress and ensured target accomplishment. Training of Project functionaries by Bank officials in conjunction with the NPIU at critical junctures facilitated the States to follow Bank procedures. In all, the excellent support provided by the Bank, its mission members, the architect and other officials must be acknowledged.

#### **F. BORROWER PERFORMANCE**

7.63. While some implementation difficulties were encountered in the initial stage, borrowers learnt from experience during the Project and ensured outcomes and achievements. Governmental support was much more forthcoming as the Project progressed. State level implementation mechanism closely monitored the Project and worked for achieving targets. The NITTTRs, NTTF and other partner organizations extended wide ranging support to academic components and assisted Polytechnics in ensuring learning gains to students and institutional quality improvement. They were also instrumental in enhancing faculty and staff capabilities. The National Project Directorate guided and facilitated Project implementation of all components at all stages and monitored Project events closely with NPIU. It enabled the Project States in overcoming obstacles which impeded developments. One major outcome in the Project was the teamwork exhibited by borrowers at different levels and locations. Consensus about the strategies and measures was visible right through the Project in all activities. Most of all, the commitment of Polytechnic teachers towards ensuring Project success must be commended.

## **G. ASSESSMENT OF OUTCOMES**

7.64. Target achievement exceeded all expectations in the Project, considering the Project scale and complexity. The benefit or impact achieved through the cluster of strategies, designed for the Project were:

- Enhanced access to technician education through increased intakes, new courses and the establishment of new polytechnics,
- Enhanced quality and relevance in educational offerings,
- Computer proficiency development and regular use of the Internet by a majority of the students,
- Strengthened academically beneficial linkages with industries and field agencies,
- Need based and planned training to institutional faculty, staff and management to enlarge their competence and capabilities and enable them to perform new and innovative roles,
- Added academic and administrative space, faculty and staff residences, and improved student facilities like hostels, canteen, play grounds,
- Introduction of a system of institutional resource and facility maintenance,
- Decentralized decision making for the targeted polytechnics through the provision of enhanced autonomy in academic, administrative, financial and managerial areas, and the adoption of corresponding institutional accountability patterns,
- The early advent of institutional sustainability and increased internal efficiency by adopting various measures like continuing education for both unemployed and employed youth and industrial workers, consultancies, and joint development initiatives with government and the public and private agencies,
- Some steps adopted to increase cost recovery and external efficiency, and
- The introduction of systemic reforms and policy initiatives to support Project strategies.

## **H. FUTURE OPERATIONS**

- Jammu & Kashmir and UT of Andaman & Nicobar Islands would complete the incomplete construction works in 3 locations soon,
- All States will undertake efforts to augment student enrollment further and bring it closed to the sanctioned values,
- Faculty and staff recruitment to fill the remnant vacancies would be accelerated,
- Faculty and staff development will be continued on a planned basis,
- The innovations in academic services offered by the polytechnics would be sustained and enhanced with the addition of new practices,
- Student employment would be promoted further as would be entrepreneurial ventures, and
- The initial mode and key lessons learnt will serve future reforms in the Project States.

## **I. KEY LESSONS LEARNT**

7.65. Given the comparative backwardness and inexperience of the Project States and UT, it was anticipated during conception that the Project implementation will run into problems soon after initiation. But the achievements in the Projects indicate a totally different picture, one of perseverance and missionary zeal with which the Project objectives were pursued. What could be the discernable reasons for the remarkable outcomes and impact?

7.66. One factor that comes to mind is the focus and application with which key stakeholders addressed Project implementation. These stakeholders were either Project Directors or senior officers of the state bureaucracy. It is this form of dedication that carried the Project through to its successful end. It must be mentioned that Project leadership followed Project events to the point of impact. This holds a lesson for any Project, which has diverse objectives and is implemented by relatively less experienced people.



7.67. Another factor that needs to be highlighted is the unexpected collaborative endeavor that was observed between government departments in the implementation process. Viewed as a consistent problem in most States and development Projects in the country, collaboration between government departments is rarely successful in practice. Many models of collaboration have been attempted at top, middle and ground levels. What probably worked in this Project was the effective and highly influencing leadership at all levels and, specifically, the ground level. More detailed studies need to be carried out about the actual model/s that were determinants of inter-department collaboration. These studies are likely to add to learning.

7.68. Not much of organizational analysis was performed in the early stages of the Project. In fact, expect for the local implementers, the NPIU or even state level officials could not predict the influence, which various stakeholders would have on the Project progress. Later on, it became clear, that resistance to the Project, if any, was overcome through polytechnic or the SPIU interventions. In reality there appears to be only meager resistance in a few cases. Not much of resistance finds a place in the reports of the Projects, nor are the interventions recorded. The crucial lesson from this experience is that the capacity of the less developed States for managing Projects should not be under rated.

7.69. As is observed in most education and other social development reforms, Project progress follows what is well known as the S – curve. The implications are that such developments will move very slowly in the early stages, then gather steam and move forward at a fast pace in the middle stages and slow down for finishing touches towards the end. The S – curve was in evidence in this Project and should be anticipated in Project planning in other reforms that will occur in the future.

7.70. The NITTTRs and NTTTF provided excellent support in preparation of Detailed Project Reports (DPRs), designing new curricula, revision of curricula, identifying equipment to be purchased, vision - mission statements, strategic planning and execution best practices, attachment to industry, job placement, tracer study and organizing & conducting training programmes for faculty and staff.

7.71. The four NITTTRs and NTTTF played a significant role in assisting the advent of academic reforms and the improvement of quality in academic services offered by the Project Polytechnics. While credit is due to them, the part played by numerous polytechnic teachers in understanding and adopting a new academic role was highly appreciable. Transferring learning to students in live classroom and laboratory sessions has never been simple. While using an innovative teaching method mix it becomes all the more complicated. That the polytechnic teachers accomplished to the extent reported shows the struggle the teachers must have waged in the course of the Project. Occasional hand holding by four NITTTRs and NTTTF faculty, suggestions from the SPIU and NPIU, and most of all the feed back and discussion that World Bank mission visits provided were assisting factors in the change process.

7.72. Each World Bank mission visit provides an opportunity for all involved agencies to clarify their concepts and strategies. In fact each visit was a learning event. There is nothing strange if all agencies involved in Project implementation learnt from the discussions in each visit and fine-tuned their strategies. The World Bank guidance and assistance are to be acknowledged for the positive role each team member played during the missions. Without their periodic interventions, the extent of Project success could have been less. A similar recognition is to be given to NPIU, State bureaucracy, SPIUs and the associated four NITTTRs and NTTTF.

7.73. The Project has made a positive impact. It fulfilled most of the impact objectives. The lesson from this is that if planning is consensual, then all agencies involved in the consensus, will reach beyond outcomes to impact. The initial understanding of impacting indicators is imperative.

### List Of New Courses Introduced

Sr. NO.	STATE/UT	Name of New Course Offered
1.	ANDAMAN & NICOBAR ISLANDS	Hotel Management & Catering Technology (D)
		Information Technology (D)
		Marine Engineering (PD)
		Deck Cadet (PD)
2.	ARUNACHAL PRADESH	Electrical & Electronic Engineering (D)
		Automobile Engineering (D)
		Information Technology (D)
		Costume Design & Garment Technology (D)
		Travel, Tourism & Hotel Management (D)
		Herbal Remedies & Cosmetology (D)
3.	JAMMU & KASHMIR	Textile Design (D) (2 places)
		Medical Laboratory Technology (D) (2 places)
		Food Technology (D)
		Travel & Tourism (D)
		Instrumentation & Control (D)
		Wood Technology (D)
	New Polytechnic at Kargil	Leather Technology (D)
		Computer Engineering (D)
		Electrical Engineering (D)
	New Polytechnic at Leh	Information Technology (D)
		Computer Engineering (D)
		Civil Engineering (D)
4.	MEGHALAYA	Travel & Tourism (D)
		Computer Science & Engineering (D)
		Information Technology (PD)
		Architectural Assistantship (D)
		Automobile Engineering (D)
		Costume Design & Garment Technology (D)
		Computer Applications (D)
		Medical Electronics (D)
Food Processing & Preservation (D)		
5.	MIZORAM	Computer Science & Engineering (D)
		Garment Technology (D)
		Beauty Culture & Cosmetology (D)
6.	NAGALAND	Electronics & Telecommunication Engineering (D)
		Computer Engineering (D)
		Information Technology (D)
		Automobile Engineering (D)
		Computer Applications (D)
Fashion Technology (D)		
7.	SIKKIM	Electronics & Hardware Maintenance (D)
		Computer Science & Technology (D)
		Telecommunications Technology (D)
		Electrical & Electronics Engineering (D)
		Computer Applications (D) (2 places)
		Mechanical Engineering (D)
		Mechatronics (D)
		Tool & Die Making (D)
		Manufacturing Technology (D)
Modern Office Management & Practice (D)		
8.	TRIPURA	Computer Science (D)
		Food Processing Technology (D)
		Automobile Engineering (D)
		Interior Decoration, Handicrafts & Furniture Design (D)
		Information Technology (D)
		Fashion Technology (D)
Medical Laboratory Technology (D)		

D : Diploma

PD : Post Diploma

## List of Technical Vocational Education & Training (TVE&T) Conducted

S. NO.	NAME OF THE COURSES	LEVEL	NAME OF THE POLYTECHNIC & STATES /UT
1	Automotive	I	BR Ambedkar Govt Polytechnic & Second Polytechnic, Andaman & Nicobar Islands
2	MS Windows Level	Stand alone	
3	Advance MS Windows	Stand alone	Rangat, Hutbay, Compbell Bay Extension centers at BR Ambedkar Govt. Polytechnic,
4	MS Windows	Stand alone	Rajiv Gandhi Polytechnic, Arunachal Pradesh
5	Engineering (Basic)	I	
6	Clothing Production	I	
7	Automotive	I	
8	Domestic Electrician	Stand alone	Kashmir Govt. Polytechnic, Srinagar, Jammu & Kashmir
9	Printing and Graphics Arts/ Desk Top Publishing	II	
10	Printing and Graphics Arts / DTP	II	Govt. Polytechnic for Women Bemina, Srinagar, Jammu & Kashmir
11	Clothing Production	I	
12	Construction (General)	I	Govt. Polytechnic Jammu, Jammu & Kashmir
13	Personal Computer Operator	Stand alone	
14	Domestic Electrician	Stand alone	
15	Domestic Electrician	Stand alone	Govt. Polytechnic for Women, Jammu, Jammu & Kashmir
16	Printing and Graphics Arts / DTP	II	
17	Wireman	Stand alone	Shillong Polytechnic, Meghalaya
18	Personal Computer Operator, MS Windows	Stand alone	
19	Automotive	I	Jowai Polytechnic, Meghalaya
20	Construction (General)	I	
21	Clothing Production	I	
22	Personal Computer Operator, MS Windows	Stand alone	Tura Polytechnic, Meghalaya
23	Printing and Graphics Arts / DTP	II	
24	Wireman	Stand alone	
25	Personal Computer Operator, MS Windows	Stand alone	Women Polytechnic Aizawl, Mizoram
26	T V Technician	Stand alone	
27	Automotive	I	Mizoram Polytechnic, Lunglei, Mizoram
28	Printing and Graphics Arts / DTP	II	
29	Law Clerk (Administration)	I	Government Polytechnic, Kohima, Nagaland
30	Personal Computer Operator, MS Windows	Stand alone	ICIT, Nagaland
31	T V Technician	Stand alone	
32	Wireman	Stand alone	Khelhoshe Polytechnic, Atoizu, Nagaland
33	Construction (General)	I	
34	Personal Computer Operator, MS Windows	Stand alone	Centre for Computers and Communication Technology (CCCT) Sikkim
35	Personal Computer Operator, MS Windows	Stand alone	Advanced Technical Training Centre (ATTC) Sikkim
36	Construction (General)	I	Polytechnic Institute, Narsingarh, Tripura
37	Automotive	I	
38	Wireman	Stand alone	
39	Basic Engineering	I	
40	Office Automation	I	Womens' Polytechnic, Agartala, Tripura

## **Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders**

All states submitted state-wise ICR reports. These were incorporated into the overall Borrowers' ICR. The full state reports are on file, and available at the NPIU.

## **Annex 9. List of Supporting Documents**

- A&N SPIU 2007. Third Technician Education Project, Implementation Completion, State Project Implementation Unit, Andaman & Nicobar Islands.
- AP SPIU 2007. Tech. Ed. – III Implementation and Results Report for each Project State/UT, State Project Implementation Unit, Arunachal Pradesh, Itanagar, 2001-2007.
- J&K SPIU 2007. Third Technician Education, State Implementation Completion and Results Report, Dept. of Technical Education, Government of Jammu and Kashmir
- Meghalaya SPIU 2007. Implementation Completion Report For the State of Meghalaya.
- Mizoram SPIU 2007. Third Technician Education, Implementation of Completion Report (ICR), Mizoram State, 2007
- Nagaland SPIU 2007. Tech. Ed III – Information Required for the Implementation Completion Report, Kohima, July 20, 2007
- NASSCOM 2005. The NASSCOM-McKinsey Study 2005. NASSCOM
- NITTTR 2007. A Study on Utilization of Institutional Resources National Report. NITTTR Bhopal, 2007
- NITTTR 2007. A Study on Assessment of Impact of World Bank Assisted Tech Ed III Project, National Institute of Technical Teachers' Training and Research (NITTTR – North Region), Sector 26, Chandigarh
- NPIU 1999. Strategy preferences of polytechnic faculty and administrators for enhancing participation of women in technician education.
- NPIU 2003. A study on continuous improvement in efficiency and effectiveness of teaching-learning process in the project polytechnics.
- NPIU 2003. A strategic plan for resource generation through transfer and greater societal interaction
- NPIU 2003. A study on current status of enrolment of women, rural and scheduled category students in polytechnics and current status of women, rural and scheduled category of technical staff in polytechnics (since 1999-2000 to 2003-2004)
- NPIU 2004. Assessment of the continuing education needs of technicians and skilled workers of nearby institutions and other organizations,
- NPIU 2004. A study on modernization of laboratories
- NPIU 2004. A strategic plan for resource generation through transfer and greater societal interaction
- NPIU 2005. A snap study on implementation of MPECS in the project polytechnics of J&K,
- NPIU 2006. A snap study on the analysis of declining participation of women, SC/ ST and OBC in project polytechnics, Delhi,
- Sikkim SPIU 2007. Third Technician Education Project in the State of Sikkim, Implementation Completion Report, Sikkim
- Tripura SPIU 2007. Third Technician Education Project – Tripura: Implementation Completion Report.

TTTTI 2002 Technician Education Project, Report on Social Assessment for Project States, Kolkata.

World Bank 1997. Country Assistance Strategy for India, IBRD and IDA. No. 17241-IN;

World Bank 1999. India Technician Education Project, Implementation Completion Report, Report N#19042

World Bank 2000. Report No. 20416-IN, India, Scientific and Technical Manpower Development in India, Education Sector Unit, South Asia Region.

World Bank 2000. Second Technician Education Project, Implementation Completion Report, Report N#20415

World Bank. 2000-2007. Third Technician Education Project Aide Memoirs from 12 Joint Review Missions and one ICR mission.

World Bank. 2001. INDIA Second Technical Education Project, Implementation Status Report, Independent Evaluation Group (IEG)

World Bank 2001. Country Assistance Strategy for India, IBRD and IDA. Report No. 21852-IN

World Bank 2001. India Vocational Education Project, Technical Education Project, Technician Education II Project, and Electronic Industry Development Project, Independent Evaluation Group (IEG)

World Bank 2001. Quality At Entry Assessment of Tech Ed III. Final Indepth Assessment. QAG

World Bank 2004. Country Strategy for India, IBRD and IDA, Report No. 29374-IN

World Bank 2004. The World Bank India Client Survey 2004, Report of Findings.

World Bank. 2007. Third Technician Education Project Post Procurement Review Reports for 2005/06.

## Annex 10. Beyond Numbers: A Glance at Personal Stories

Behind the many numbers in this completion and results report, there are thousands of personal stories of how students, families, communities, teachers, and firms have benefited from the project. This annex presents seven personal stories from the Andaman & Nicobar Islands; Four beneficiaries from regular diploma and post-diploma courses and three beneficiaries from the community-outreach training classes. While not every singled person benefiting from the project has been as fortunate and talented as these individuals, the presented testimonies are considered to be a fair picture of thousands of supported students and families.

Charles George hailing from a remote village of Mayabunder Tehsil (260 km away from Port Blair, A&N Islands) enrolled in the Diploma course in Information Technology, a newly created program under the Tech. Ed. III project. He belongs to a community of Karen tribe brought to these islands from Myanmar by British colonizers for their ability in forest works. They have also been given Other Backward Class (OBC) status by Government of India. He is presently placed in Hewlett Packard, Bangalore dealing with technical support to US clients and drawing a monthly salary of Rs 20,000/-. Charles George is a good case of how innovative practices adopted by the institute have transformed a student hailing from rural background to a full fledged professional. During his diploma performance he took up a real time project of computerizing fleet management of state transport department on a web based platform which made him technically strong and above his mainland counterparts. The student information system introduced by the institute was able to track students strength short-comings and helped the faculty to draw out a plan to improve communication, presentation skill and confidence level.



Ms. E T Sindhu enrolled in Polytechnic education for a diploma in IT. She did her schooling in Hindi medium and hails from a middle class family. She was weak in her communication in English in the initial stages but she improved substantially in her communication skills during her diploma course. She passed out in the year 2006. She was able to compete with her counterparts in mainland India and find a slot in a multinational company, HP Bangalore. During the job interview she had to compete with degree holders at the national level and she got through with her excellent skills, updated knowledge and pleasing personality. She is presently drawing a salary of Rs 20,000/- per month.

Mr. S.Rajan belongs to a family of marginal farmers from South Andaman. He joined the newly started Diploma in Hotel Management & Catering Technology under the Tech. Ed.-III project. This Polytechnic is networking partner of IHMCT, Dadar and final year students are sent to industrial attachment training to various organization in Mumbai for a period of 3 months. Mr. S.Rajan went for his training and worked at Hotel Radisson, Mumbai. After completing the training he landed a 6 months course for Ground Supervision in Air India. After completion of the course he got an appointment in Taj Flight Catering Service in Mumbai. At present he is trainee supervisor looking after the catering services for Lufthansa. It is highly encouraging that Mr. S.Rajan hailing from a humble background is now a responsible person handling an international catering operation in Mumbai. It is an amalgamation of effort by the Polytechnic Institute to improve the soft skills of the students to cope with the requirement of the



industry, effective networking arrangement and a structured roll out map for the students which is now paying dividend to the students.



**M.S.PERUMAL**  
23-02-1984

**Mr. M.S. Perumal** completed diploma in Mechanical Engineering and was unable to decide his future course of action. Jobs were not available and it would have been a long wait for him for seeking a satisfactory employment in the islands. He hails from a family settled in Rangat and a good job was his immediate requirement for supporting his family. The Post Diploma in Marine Engineering Course opened up an opportunity for him. He joined the course though the course cost was well above his family's financial capability. During diploma education he was just a mediocre student but after joining PDME there was a transformation in his attitude. A vision of bright future motivated him to strive for perfection. His academic side improved under the guidance of faculty appointed through MTI, Mumbai. There was a new found

leadership quality in his character. Communicating in English used to be an ordeal for him but continuous coaxing by the faculty and creation of an environment of a professional merchant shipping line atmosphere in the campus allayed his inhibitions. With in a year he became a role model not only for the PDME students but also for the entire campus. Presently he is working in Eurasia, an international shipping line, at an average salary of Rs 40,000/- bringing happiness to him and his family. This success will alleviate economic condition of Mr. M.S. Perumal's family and inspire youngsters from his community to emulate him.

The following three beneficiaries were part of a group of 229 learners who attended the Advanced Training in Fashion and Apparel Designing. The course made a significant contribution to the economic alleviation of participating women:

**Ms. Reva Mondol** attended the Port Blair main center. She is one of the enterprising beneficiary has set up their own enterprise. After graduation she set up a shop (Ishan Garments) and gradually earned good reputation for her skill. Presently, she is able to make a turn over of about Rs. 100,000 per annum and employs five colleagues in her establishment.

**Ms. Ayesha Bibi** also completed the course at the Port Blair main center. She started a small productive unit at her residence and earns Rs. 4000-5000/- per month. She hired two helpers for her business.

**Ms. Gauri Rani Mandal** graduated from Diglipur center. Her family consists of six numbers and her father was the only one earning member. She is now able to earn Rs 4000/- per month and alleviate the economic condition of her family.

