

# MODERNIZATION OF TECHNICIAN EDUCATION IN INDIA- A CASE STUDY

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# GLOBAL PROGRAMS IN MODERNIZATION OF HIGHER EDUCATION

- ◉ EU Programs
- ◉ Bologna Process
- ◉ Russian Federation Programs
- ◉ South Korean Programs
- ◉ Hong Kong Programs
- ◉ Indian Programs

# HIGHER EDUCATION MODERNIZATION IN RUSSIAN FEDERATION

- ◉ BOLOGNA PROCESS
- ◉ FOSTERING LIFE-LONG LEARNING
- ◉ FOSTERING INNOVATIONS BY UNIVERSITIES
- ◉ NORM BASED FUNDING
- ◉ MULTI-CHANNEL FINANCING OF HIGHER EDUCATION
- ◉ LOANS AND FELLOWSHIPS TO STUDENTDENTS FROM THE STATE
- ◉ ACCESS TO EDUCATION.
- ◉ QUALITY ENHANCEMENT
- ◉ MORE FUNDING TO HIGHER EUDUCATION
- ◉ CO-FUNDING ON THE PART OF UNIVERSITIES/ INDUSTRIES

# REFORM OF EDUCATION IN RUSSIAN FEDERATION

- ◉ PERSONALITY-ORIENTED PEDAGIGAL EDUCATION
- ◉ BASED UPON CULTURAL, HISTORIC AND ACTIVITY-ORIENTED APPROACHES
- ◉ DEVELOPMENT OF GENERAL AND PROFESSIONAL CULTURE
- ◉ REJECTION OF A KNOWLEDGE-CENTRED APPROACH
- ◉ FOCUS ON STUDENT-CENTEREDTEACHER TRAINING
- ◉ MIXING EDUCATION, REFLECTION, JOINT STUDENT AND FACULTY DISCUSSIONS OF EDUCATIONAL ISSUES AND JOINT RESEARCH

# TRANSITION TO A MULTI-LEVEL SYSTEM OF HIGHER EDUCATION

- ◉ STANDARDISATION OF PATTERNS AND SPECIALISATION IN TEACHER TRAINING
- ◉ DEVELOPMENT OF STATE EDUCATIONAL STANDARDS FOR HIGHER PROFESSIONAL EDUCATION
- ◉ DEVELOPMENT OF STATE STANDARDS OF PEDAGOGICAL EDUCATION
- ◉ RENEWING THE EDUCATIONAL CONTENT IN PEDAGOGICAL INSTITUTIONS
- ◉ HIGHER EDUCATION TEACHER TRAINING INSTITUTIONS
- ◉ HIGHER ENROLLMENT IN HIGHER TEACHER TRAINING INSTIUTIONS

# GLOBAL COMPONENTS IN MODERNIZATION IN INDIA

- ◉ Global market orientation of the curriculum
- ◉ High end skills and competencies
- ◉ Active industry involvement curriculum planning
- ◉ Revision of curricula based on the feedback
- ◉ Introduction of new curricula
- ◉ Global accreditation
- ◉ Faculty development
- ◉ Modernization of infrastructure , labs and workshops

# CREATING A LEARNING ORGANIZATION

- ◎ CREATING MENTAL MODELS
- ◎ TEAM LEARNING
- ◎ SHARED VISION
- ◎ PERSONAL MASTERY
- ◎ SYSTEM THINKING

# LEARNING APPROACH

- ◉ Project based action learning approach in learning organization
- ◉ Theory and framework



# BACKGROUND OF INDIAN ENGINEERING EDUCATION

- ◉ Faculty shortage
- ◉ Lean industry-academia collaboration
- ◉ Obsolete learning infrastructure
- ◉ Stagnating research
- ◉ Attracting students to become faculty
- ◉ Imbalance in student output at bachelors, masters and doctoral level

# NEED FOR MODERNIZATION OF TECHNICIAN EDUCATION IN INDIA

- ◉ INDIA GLOBALIZED ITS ECONOMY IN 1991
- ◉ FOREIGN DIRECT INVESTMENT IN MANUFACTURING
- ◉ MODERN MANUFACTURING INDUSTRY NEEDS COMPETENT ENGINEERS , TECHNICIANS, AND SKILLED WORKERS
- ◉ TECHNICAL INSTITUTES HAVE TO UPDATE THEIR FACULTY, CURRICULA, LABS, RESOURCES AND WORKSHOPS

# LABORATORIES AND WORKSHOPS

- ⦿ LABS NEED TO BE MODERNIZED
- ⦿ MODERN MACHINES ARE TO BE INSTALLED
- ⦿ CNC MACHINES ARE TO BE INCORPORATED IN THE WORKSHOP PRACTICES
- ⦿ FMS HAS TO BE INTRODUCED
- ⦿ ROBOTICS ARE ALSO TO BE ADDED
- ⦿ ADVANCED WELDING METHODS ARE TO BE INTRODUCED

# POLYTECHNIC COLLEGES

- ◉ SOME OF THEM ARE MORE THAN 30 YEARS OLD
- ◉ PRODUCES TECHNICIANS ( MIDDLE LEVEL WOKERS AT SHOP FLOOR)
- ◉ CENTRALIZED CURRICULUM DESIGN
- ◉ CENTRALIZED EDUCATIONAL ADMINISTRATION
- ◉ OLD CURRICULA
- ◉ FACULTY NEEDED CONTENT UPDATING
- ◉ INSTRUCTIONAL DESIGN NEED TO BE UPDATED
- ◉ NEW DIPLOMA PROGRAMS NEED TO BE INTRODUCED

# PLANNING FOR MODERNIZATION

- ◉ STATE DIRECTORATES OF TECHNICAL EDUCATION ARE THE AGENCIES FOR PLANNING FOR MODERNIZATION
- ◉ POLYTECHNICS STARTED THE PLANNING PROCESS BASED ON THE INSTITUTES' NEEDS TO SERVE THE STATE AND REGION
- ◉ THE NEEDS OF THE INDUSTRIES WERE CONSIDERED
- ◉ AN OUTCOME ORIENTED APPROACH

# DETAILED PROJECT REPORT (DPR)

- ◉ DRAFTED BY THE POLYTECHNICS AND REVIEWED BY THE DIRECTOR OF TECHNICAL EDUCATION
- ◉ ASSISTED BY ACADEMIC CONSULTANT
- ◉ SIGNED BY THE SECRETARY OF EDUCATION
- ◉ SUBMITTED TO THE MINISTRY OF HUMAN RESOURCE DEVELOPMENT, GOVERNMENT OF INDIA
- ◉ PRESENTED TO THE WORLD BANK FOR ITS APPROVAL AND FUNDING

# PROJECT AUTHORITIES

- ◉ NATIONAL PROJECT IMPLEMENTATION UNIT (NPIU) AT NATIONAL LEVEL
- ◉ STATE PROJECT IMPLEMENTATION UNIT (SPIU) AT STATE LEVEL
- ◉ POLYTECHNIC PROJECT IMPLEMENTATION UNIT (PPIU) AT THE POLYTECHNIC LEVEL
- ◉ PROJECT FACILITATION UNIT(PFU) AT CONSULTANT INSTITUTE (NITTTR)

# ACADEMIC CONSULTANTS

- ◉ ACADEMIC CONSULTANTS (NATIONAL INSTITUTES OF TECHNICAL TEACHERS TRAINING AND RESEARCH- (NITTTR)- BHOPAL, CHANDIGARH, CHENNAI & KOLKATA)
- ◉ NITTTRS OFFER FACULTY DEVELOPMENT PROGRAMS, ASSIST IN CURRICULUM DEVELOPMENT, PRODUCE INSTRUCTIONAL PACKAGES, MONITOR THE PROGRESS OF THE PROJECT
- ◉ UNDERTAKE RESEARCH STUDIES
- ◉ HELPED PROCUREMENT CONSULTANT
- ◉ HELPED BUILDING WORKS CONSULTANT



# ACADEMIC CONSULTANTS

- ◉ FACULTY DEVELOPMENT (SHORT- TERM TO LONG-TERMPROGRAMS)
- ◉ CERTIFICATE COURSES, MASTER AND DOCTORAL PROGRAMS
- ◉ CURRICULUMEVALUATION, AND REVISION AND PLANNING FOR NEW DIPLOMA PROGRAMS
- ◉ GLOBAL CONSULTANTS
- ◉ EXTENSION SERVICES
- ◉ SPECIFICATION FOR EQUIPMENT
- ◉ PLANNING FOR CONTINUING EDUCATION PROGRAMS FOR THE WORKING PROFESSIONALS
- ◉ EXAMINATION REFORM
- ◉ STRATEGIES FOR MODERNIZATION OF LABS & WORKSHOPS
- ◉ INSTRUCTIONAL PACKAGE DEVELOPMENT
- ◉ PLANNING FOR ACADEMIC AUTONOMY
- ◉ INTERNAL REVENUE GENERATION AND UTILIZATION
- ◉ RESEARCH STUDIES
- ◉ FORMATIVE EVALUATION OF THE PROJECT
- ◉ ASSIST IN THE ESTABLISHMENT OF GOVERNING COUNCILS AND ACADEMIC COUNCILS
- ◉ IMPACT STUDIES

# NATIONAL PROJECT IMPLEMENTATION UNIT (NPIU)

- ◉ COORDINATION BETWEEN THE STATES, CENTER AND WORLD BANK
- ◉ EVALUATION OF THE PROGRESS AND MONITORING THE REIMBURSEMENT
- ◉ CONDUCT OF JOINT REVIEW MEETINGS WITH WORLD BANK AND STATES
- ◉ FOLLOW UP WITH THE FEEDBACK
- ◉ COORDINATION WITH ALL CONSULTANTS

# PROCUREMENT CONSULTANT

- ◉ ADVERTISING THE NEEDS OF THE TOOLS, EQUIPMENT AND MACHINES
- ◉ COMPARISON OF THE QUATATIONS IN CONSULTATION WITH ACADEMIC CONSULTANT
- ◉ PLACING ORDERS AND PAYMENT TO THE SUPPLIERS
- ◉ TRAINING THE OPERATORS
- ◉ MAINTENANCE CONTRACT

# COMPONENTS OF MODERNIZATION

- CAPACITY BUILDING OF THE POLYTECHNICS, INTRASTRUCTURE DEVELOPMENT, BUILDING CLASS ROOMS, WORKSHOPS, AND LABORATORIES
- QUALITY IMPROVEMENT OF FACULTY, CURRICULUM, INSTRUCTIONAL SYSTEM, AND EXAMINATION SYSTEM
- EFFICIENCY IMPROVEMENT OF ADMINISTRATION OF TECHNICAL EDUCATION, ESTABLISHMENT OF CURRICULUM DEVELOPMENT CENTER, CONTINUING EDUCATION CENTER, AND LEARNING RESOURCE DEVELOPMENT CENTER

# BUILDING WORKS CONSULTANT

- ◉ PLANNING THE BUILDINGS & INFRASTRUCTURE
- ◉ SPECIFICATION, DESIGN, ESTIMATION, TENDERING AND SELECTING AGENCIES
- ◉ MONITORING THE CONSTRUCTION, QUALITY, PAYMENT FOR THE WORKS
- ◉ HANDING OVER THE BUILDINGS TO THE POLYTECHNICS
- ◉ SETTLEMENT OF BILLS

# CAPACITY BUILDING

- ◉ NEW BUILDINGS, CLASS ROOMS, WORKSHOPS, LIBRARY, LABORATORIES
- ◉ HOSTELS, STAFF QUARTERS, AUDITORIUM, MULTI PURPOSE HALLS, GUEST HOUSE, CAFETRIA
- ◉ EXTENSION CENTERS FOR TRAINING THE RURAL YOUTH
- ◉ MODERN EQUIPMENT, FURNITURE, COMPUTERS, SOFTWARE FOR ALL LABS.
- ◉ NEW POLYTECHNICS
- ◉ NEW PROGRAMS

# QUALITY IMPROVEMENT

- ◉ FACULTY DEVELOPMENT
- ◉ CONTENT UPDATING, INDUSTRIAL TRAINING, OVERSEAS TRAINING, CURRICULUM EVALUATION & DEVELOPMENT OF NEW CURRICULA, INSTRUCTIONAL PACKAGES DEVELOPMENT, ITEM BANKS, EXAMINATION REFORMS, LEADERSHIP, ADMINISTRATION, STUDENT SERVICES, RESEARCH STUDIES, & PUBLICATION

# QUALITY IMPROVEMENT...

- ◉ JOINT EVALUATION OF EXISTING CURRICULA, PLANNING INTERDISCIPLINARY CREDIT BASED & FLEXIBLE CURRICULA.
- ◉ IMPROVING THE CONTENT KNOWLEDGE AND COMPETENCIES OF THE FACULTY THROUGH TRAINING
- ◉ EXAMINATION REFORM
- ◉ INCORPORATING EFFICIENCY AND EFFECTIVENESS
- ◉ EXPOSURE TO EDUCATIONAL MANAGEMENT
- ◉ CONTINUOUS PROCESS IMPROVEMENT IN EDUCATIONAL PLANNING AND IMPLEMENTATION
- ◉ INDUSTRY - INSTITUTE-- PARTNERSHIP
- ◉ STUDENT GUIDANCE, COUNSELING, TRAINING AND PLACEMENT



# MULTIDISCIPLINARY CURRICULA

- MECHATRONICS
- CIVIL & ARCHITECTURAL ENGINEERING
- MECHANICAL & PRODUCTION ENGINEERING
- ELECTRICAL & ELECTRONICS ENGINEERING
- ELECTRONICS & COMMUNICATION ENGINEERING
- ELECTRONICS & INSTRUMENTATION ENGINEERING

# EFFICIENCY IMPROVEMENT

- ◉ ACADEMIC AUTONOMY
- ◉ ESTABLISHMENT OF BOARD OF GOVERNORS
- ◉ ORGANIZING ACADEMIC COUNCIL
- ◉ QUICK RESPONSE TO INDUSTRIAL NEEDS BY IMPROVING THE CURRICULA AND STARTING NEW CURRICULA
- ◉ IMPLEMENTATION OF CREDIT BASED CURRICULA
- ◉ INTRODUCTION OF NEW ELECTIVES
- ◉ CREDITS FOR INDUSTRIAL TRAINING
- ◉ QUICK PUBLICATION OF RESULTS, AWARD OF DIPLOMAS, INDUSTRIAL PLACEMENT THROUGH CAMPUS INTERVIEW
- ◉ RECRUITMENT OF FACULTY THROUGH CONTRACT SYSTEM
- ◉ SUSTENANCE OF PROJECT INNOVATION

# LEARNING TO CHANGE

- Virtual business learning approach to professional workplace learning

# RESEARCH STUDIES ON TECHNICIAN EDUCATION SYSTEM

- ◉ NEEDS ANALYSES OF WORKING PROFESSIONALS AND OFFERING CONTINUING EDUCATION PROGRAMS
- ◉ MODERNIZATION OF LABORATORY
- ◉ CONTINUING EDUCATION
- ◉ EQUIPMENT AND SPACE UTILIZATION
- ◉ ENROLLMENT OF WOMEN
- ◉ TRACER STUDY OF ALUMNI
- ◉ CONTINUOUS PROCESS IMPROVEMENT IN EDUCATIONAL PLANNING AND IMPLEMENTATION
- ◉ PROJECT IMPACT STUDY

# ACHIEVEMENT OF THE PROJECT

- ◉ MORE WOMEN STUDENTS JOINED TECHNICIAN EDUCATION PROGRAMS
- ◉ MAJOR BREAK THROUGH
- ◉ POLYTECHNICS HAVE BECOME LEARNING ORGANIZATIONS
- ◉ QUICK RESPONSE TO INDUSTRIAL NEEDS
- ◉ A CENTER OF TECHNICAL SERVICES AND CONTINUING EDUCATION FOR WORKING PROFESSIONALS
- ◉ A CONSULTACY CENTER FOR MICRO AND SMALL ENTERPRICES
- ◉ A TESTING CENTER FOR ENGINEERING MATERIALS

# TOWARDS THE CONTINUOUSLY LEARNING ORGANIZATION

- Through knowledge networking

# LEARNING THROUGH THE PHYSICAL ENVIRONMENT

- ◉ Workplace- labs, workshops, class rooms
- ◉ Culture - continuing education programs, consultancy projects, and extension centers
- ◉ Roles - teacher, consultant, leader and mentor
- ◉ Routines - perspective planning, strategic planning and tactical planning
- ◉ HIGH TRUST CULTURES !

# IMPACT OF THE PROJECT

- LONG-TERM SUSTENANCE OF INSTITUTES
- CONTINUOUS HUMAN RESOURCE DEVELOPMENT
- ENSURED THE CONTINUOUS SUPPLY OF TECHNICIANS WITH DESIRED SKILLS AND COMPETENCIES
- FACILITATED THE ESTABLISHMENT OF MODERN MANUFACTURING INDUSTRIES IN INDIA
- AROUND 700 POLYTECHNICS WERE MODERNISED
- PROJECT IS TERMED AS “HIGHLY SATISFACTORY” BY THE WORLD BANK
- RETURN ON INVESTMENT IS MANY FOLD



# IMPACT OF BOLOGNA PROCESS IN RF

- ◉ Autonomy to the universities
- ◉ Outcome based higher education programs
- ◉ Learner centered instruction
- ◉ Life-long learning
- ◉ Modernized and Competence based unified curricula
- ◉ Bachelor and master degree programs
- ◉ Credit transfer under ECTS and Academic mobility
- ◉ Continuing education programs
- ◉ Establishment of technoparks
- ◉ Faculty development
- ◉ Generation of Finance
- ◉ Organizational structure
- ◉ Setting goals and objectives
- ◉ Admission regulations , fee fixation, generating revenue

# LEARNING ORGANIZATIONS WERE CREATED!

- ◉ MENTAL MODELS OF CENTER OF EXCELLENCE
- ◉ TEAM LEARNING (CONTENTS, MANAGEMENT, CONSULTANCY)
- ◉ PERSONAL MASTERY THROUGH PLANNED FACULTY DEVELOPMENT
- ◉ SHARED VISION WITH THE FACULTY, LEADERS AND COMMUNITY
- ◉ SYSTEM THINKING ( PROACTIVE, LINKED WITH OPEN BORDERS WITH THE SOCIETY)

# LEARNING WITHOUT FRONTIERS !

- ◉ AN OPEN AND RESPONSIVE LEARNING IS CREATED
- ◉ MULTIPLE PERSPECTIVES ON LEARNING
- ◉ NATURE AND IMPORTANCE OF LEARNING
- ◉ MULTICHANNEL LEARNING CONTEXTS
- ◉ DESIGNING WITH INTEGRATED CONTEXTS

THANK YOU

ALL

FOR YOUR PARTICIPATION !

QUESTIONS ?  
PLEASE

