

EDUCATIONAL DEVELOPMENT STRATEGY IN MAHARASHTRA STATE FOR IMPLEMENTING WORLD PROJECTS FOR TECHNICIAN EDUCATION

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Context

The Maharashtra State will embark on the world Bank's Project on "Strengthening of the Technician Education" costing Rs. 122/- crores commencing from September, 1991.

The whole project is divided into three sub-project subcomponents — Capacity Expansion, Quality Improvement and Efficiency Improvement.

"Capacity Expansion" subcomponent envisages starting new diploma and advanced technician's courses, strengthening newly established polytechnics, new polytechnics in emerging areas for women's education, strengthening community polytechnic network, and bettering hostel facilities for students and residential quarters for staff.

"Quality Improvement" subcomponent aims at modernization of laboratories and workshops, staff development, Improving curriculum processes, stimulating LRDCs and LRUCs and use of computer for effective student learning and academic and administrative management.

"Efficiency Improvement" subcomponent envisages strengthenings DTE, SBTE, improving industry-institute interaction, introducing flexibility in curriculum structure,

promoting autonomy in institutions, bettering maintenanc system.

Expected Outcomes

Two types of outcomes are expected at the end of the project :

1. Quantitative expansion of the technician education like increased number of courses for emerging areas, employed workers, women and rural development, as well as better residential facilities for students and staff.
2. Qualitative improvement in the educational process like student's learning, instructions, curriculum management at the institutional level, and state level policy planning, administration and curriculum management. It will also improve supporting systems functioning like liaisoning, instructional material development, industry institute interaction, computerization, maintenance, distance education etc.

Need for Adoption of Problem Solving Cycle

Introducing scientific techniques in quantitative expansion and qualitative improvement schemes to improve their effectiveness and efficiency is not a one shot affair. There are no readymade

the problems of development.

Every project institute will have to engage in systematic problem solving cycle to find solutions and internalise them in the system. The problem-solving cycle consists of

- a) felt need,
- b) problem formulation,
- c) proposing proposals for solutions,
- d) forecasting consequences of proposed solutions and testing them,
- e) taking action-steps to implement the solution and
- f) evaluating out-comes.

Problem-solving and pilot testing are expensive activities and cannot be undertaken by all project institutions simultaneously. Neither, it is possible for all institutions to pool all expertise : subject matter, educational science, organizational development expertise etc.

The second alternative is to adopt NETWORKING.

System wide adoption of Innovation and diffusion phases are inventions, innovation and diffusion. The starting point of all innovations are the scientific discoveries by the scientists which are picked by the technologists developing tools, products, and procedures to improve field practices. Technologists first have to test these tools for their technical suitability, economic viability and social acceptability, before it is allowed for mass consumption.

In the field of educational development, this is done jointly by

- i) inventive activities by research organization and resource system,
- ii) experimentation for pilot testing of innovation by certain selected lead educational institution and

- iii) diffusion for mass adoption by the other educational institutions of such tested innovations.

Past Experience Of Maharashtra In Educational Development

Maharashtra State tried to adopt many innovative schemes initiated by the Central govt. through their qualitative improvement and DCA schemes. For example, Library development, resource centre development, community polytechnics, computerization, modernisation, instructional material development, promoting autonomy etc.

There was, however, no planned strategy for educational development, First the schemes were introduced at different points of time, thus destroying their interdependence in educational development.

Second, the finance by the Central Govt. were given for only selected aspect of infrastructural development like equipment only, building and staff being supplied by the State Govt. etc. Since there was no joint planning by the Central and the state Govt. on any developmental project, not a single schemes was implemented in an integrated way.

Third, there was no long-range strategy for educational development which linked systematically invention, innovation and diffusion aspect through careful networking.

The world Bank project has removed the first and second gap by ensuring that both the Central and State Govt. jointly plan all aspects of the development projects. The State of Maharashtra has been trying to remove the third gap of the long-range strategy for educational development.

Strategy Of Educational Development In Maharashtra

TES of Maharashtra will function at the following three levels

Level	Organisations	Linkages	Nature of Function	O V E R V I E W O F T H E S T R A T E G Y
I State Level	Ministry of Technical Education	Related ministries like planning, Finance, Industry, Agriculture, Rural Development etc.	State level policy making on Educational Development	
	Directorate of Technical Education	NTMIS Nodal Centre, TTTI Bhopal, TTTI Extension Centre, Pune. Institutions of Higher learning, Directorate of Vocational Education, Secondary Education, State level representative of Industry	State level administration of Educational development Project.	
	State Board of technical Education State Resource Systems for selected sectors of development	- Do - - Do -	State level co-ordination of Curriculum management. Provide R/D, E/T and Extn. services input on "Manpower development" in the selected sector of development for policy making and also conducting courses in these areas.	
II Regional Level	Regional Offices of DTE (Six)	Regional offices of the above mentioned organisation	Same as DTE but restricted to one region	
	Regional offices of the BTE (Three) Lead Centres (Six) Other Polytechnics	- Do - TTTI Extn. Centre, NTMIS Nodal Centre, Regional Office of DTE & BTE, Regional Institutes of higher learning, Industries of regional importance.	Same as BTE but restricted to two regions One fro each region to - a. serve as an extended regional arm of TTTI Extension Centre b. to carry out pilot testing of innovation to ascertain technical suitability, economic riability and social acceptability of innovation c. diffusion of innovations to other polytechnic with in the region.	
III Institutiona Level. I	Other Polytechnics	RO of DTE/BTE/Lead Centres/SRS Local instituions of higher learning	To adopt, adapt, and internalize new tested innovations in their own institutions as part of the strategy of system wide diffusionj.	

Further clarification of the proposed three levels of functioning are given below :

State Level Policy Making

While Polytechnic education is a state subject, policy making needs to be done within the national framework laid by MHRD (BTE). National policies for quantitative expansion and the qualitative improvement and maintenance of standards are supposed to be laid down by the AICTE and its implementation ensured by WRC of AICTE at the regional level and the state level.

The state Ministry of Education is at present guided by the Directors of Technical Education for policy making in TES. In future both the SMOE and SDTE will have the benefit of the STATE Council of Technical Education of which the Secretary, State Ministry of Education will be the chairman and the State Directorate of Technical Education, the Member Secretary. The Policy making is proposed to be strengthened by :

1. Establishing SCTE in which representatives from the related ministries, experts from different fields of developments, research institutions, other related research organization and NTMIS will participate.
2. Linking Directorate of Technical Education closely with the Resource System like TTTI and NNTMIS to provide substantial policy research input in the problems of the quantitative and qualitative development of the technical education in the state.
3. Professionalizing office of the Directorate of Technical Education in the state and developing adequate competency to organize scientific project planning and management of

the educational development project.

4. Professionalizing State Board of Technical Examinations for planning and co-ordinating state level scientific curriculum development and maintenance of standards.

State Level Administration

The main role of the Directorate of Technical Education is

- (a) to assist ministry of Education to promote rational policy making at the state level (with research inputs from TTTIs and NTMIS)
- (b) to translate those policies into strategic action plans of the state directed at created among other state level bodies, regional level institution and lead centres and other polytechnics and students, the awareness on the implications of the new policies and their possible impact on them; redesign the state sub-systems operating at various levels; obtain funds for the additional resources; and guide, monitor and evaluate the performance of these institution in the light of the new policy framework.

By the end of the project, the directorate is now proposed to be strengthened by new wings consisting of :-

- 1) Design Section
- 2) Development Section
- 3) Implementation Section
- 4) Evaluation Section.

These wings will constantly organize labour market survey, design and redesign new technical education structure at the state level to manage effectively both quantitative expansion and qualitative improvement schemes, prepare strategic plans to provide timely resources to

affected institutions, delegate powers and evaluate their institutional performance.

Maharashtra is administratively divided in six regions -

1. Bombay,
2. Pune,
3. Nasik,
4. Aurangabad,
5. Amaravati,
6. Nagpur.

State Directorate will have its Regional Directorate at the region's head quarters to co-ordinate administration of technical educational development schemes in the region i.e. better intense regional orientation of the new proposals to regional and local institutions, ensure timely provision or resources for the institutions, organise, monitor and evaluate their activities and provide timely feedback to the Directorate about the strengths and weaknesses of the regions. It will also have a design wing and implementation wing simialr to the one at the state level.

State Directorate and its regional offices will be closely linked by the computerised management information system.

The state Directorate of Technical Education will have a staff development cell to give directions to staff development of DTE staff in close collaboration with Regional TTTI.

State Coordination Of Curriculum Process And Maintenance Of Standards

The primary responsibility for maintaining the quality of curriculum design, development and implementation, ensuring the maintenance of standards of the students learning, research activities and extension activities of the educational institution as well as certification and

accreditation of National and State Level courses will be that of the State Board of Technical Education.

The state Board of Technical Examination which is now responsible for only prescribing curriculum and conducting examinations and certification, will be re-designated as the State Board of Technical Education (not Examination). This will also enable the Maharashtra State to fall in line with the other State's pattern which also have similar state Boards of Technical Education with enlarged roles mentioned above.

The State Board will be strengthened with new sub-system of :-

- a) Curriculum Development Centre
- b) co-ordinating cell for Learning Resources Development and Utilization,
- c) state level Computerized Management Information system for academic programme management.

Its existing examination centre will be strengthened to provide better administrative support to the Chairman and the Secretary, to enable them to devote more time for understanding research results, modernise curriculum, guide and monitor institutions to implement those curricula in an academically sound way and provide steady evaluation of course performance for certification and accreditation.

The curriculum Development Cell will be responsible for modernizing existing curriculum and designing new curriculum using scientific techniques, make strategic plans for its development, guiding institutes to upgrade the quality of their human resources, physical resources and instructional resources (print and non-print)

which form the necessary part of the revised or new modernized curriculum.

The Curriculum Development Cell will also ensure formative evaluation through its regional offices and its own evaluation wing, of the State Resources Centres and lead centres in the region and with their help the formative evaluation of the other polytechnics.

The Co-ordinating Cell for LRD and LRU of the State Board of Technical Education will co-ordinate the design, development and evaluation of the learning resources production and their utilization in the SRC and lead centres and other polytechnics. It will have close links with the course production and distribution system of the Govt. Polytechnic for the Distance Learnings. It is proposed to make use of learning resources development expertise of the GPDL for strengthening the LRD and LRU activities within the formal polytechnic education system and not to duplicate the work done by GPDL for supplying learning resources to the staff and students of the formal systems.

The State Board of Technical Education's Computerized management information system will be responsible for acquiring and storing all academic data needed to formulate policies and developing strategic and operational plans to maintain quality of all educational processes - curriculum design/development of instructional resources and maintaining quality of staff's academic performance.

The State Board of Technical Education will work under the general policy directions of the Advisory body chaired by the Chairman of the State Board of Technical Education and where all representatives of the

related organizations responsible for academic activities will be represented.

State Resource Systems And Lead Centres

Manufacturing and infrastructure development sectors -

Traditionally the Directorate has been planning and implementing both the quantitative expansion and qualitative improvement schemes for this sector of development.

Under the World Bank Project, DTE is expected to streamline quantitative expansion of the schemes with the assistance of NTMIS & its nodal centres.

The qualitative improvement schemes at the state level will be planned and implemented by the Directorate with the assistance of TTIs and lead centres in every region. For this sector, six lead centres are proposed as the 80% of the polytechnics run Civil, Mechanical, Electrical, Electronics, Computer Science courses. In view of the increased number of such institutes, the scope of educational development activities are also quite substantial i.e. both pilot testing and diffusion. This cannot be done through one institute in a state & is planned to be done regionally through each of the lead centre.

Other Sectors of Development

Agricultural sector, service sector, social development sector constitute the other sectors of development of the country's planned economy.

Systematic manpower development is picking up only recently in these sectors such as pharmacy, Travel and Tourism,

Health, Business and Commerce. Information Technology, Printing Technology, Teaching Training, rural development.

The number of institutions for each of these sectors are comparatively few in number, To promote invention, innovation and diffusion, it is proposed to designate only one leading institution in the state as the state level lead centre (State Resource System).

The role of both state Lead and Regional Level Lead Centres will be :

- To carry out research to develop inventive and innovative ideas for efficient educational development and feed them to DTE & BTE for state level policy making and administration;
- To take this research effort for pilot testing of innovations to ascertain their technical suitability and economic viability and social acceptability;
- To disseminate tested innovations to other polytechnics and help to adopt, adapt and internalise these innovations.

Maharashtra state has identified following state level and regional level Lead Centres.

State Level Lead Centres :

Name	Sectors of Development
SBM Bombay	Continuing Education
College of Pharmacy, Karad.	Pharmacy
Institute of Hotel Management, Pune.	Travel & Torism
CWIT, Pune	Rural Development
Women's Polytechnic, Nagpur.	Women's Education

Institute of Printing Technology, Pune	Printing
Govt. Polytechnic, for Distance Learning, Pune.	Distance Learning

Regional Lead Centres :

Institute	Region
Govt. Polytechnic, Pune	Pune
Govt. Polytechnic, Bombay	Bombay
Govt. Polytechnic, Nasik	Nasik
Govt. Polytechnic, Aurangabad	Aurangabad
Govt. Polytechnic, Amravati	Amravati
Govt. Polytechnic, Nagpur	Nagpur

Facilitating Invention, Innovation & Diffusion through "Creating" "Educational Technology Intelligence" with state & regional & polytechnic level organisation of Maharashtra.

Picking up inventions, converting them into innovation & then diffusing tested innovations to other institutions does not take place automatically. It requires the existence of "Educational Technological intelligence" within an organization. It is provided by the faculty who are well conversant with the professional vocabulary of Educational Technologists and are engaged in the R/D for innovation.

In the World Bank project institutions, it is proposed to plan & implement all these schemes through project teams in the lead centres consisting of (see fig. 1) -

- Faculty of the polytechnics responsible for teaching & curriculum management at the departmental level & institutional level
- Internal polytechnics based experts in educational technology curriculum development &

institutional management now being provided under various World Bank qualitative schemes

- c) Faculty of external resources system like TTIs, IITs or IIM etc.

Picking up of inventions, on-the-job planning, testing, and implementation of the innovations & then arrange for its diffusion will be done by this team.

These polytechnics receiving information from the lead centres will also have such project team on a smaller scale which will be responsible for internalising the tested innovative practices through adoption, adaptation & internalisation.

Similar project teams will be instituted in the state Directorates & State BTE for improving state level policy making, administration, guidance & counselling & evaluation.

Such R/D activities will provide the staff the opportunity to apply the concepts of the Educational management & social science, to improve teaching, curriculum management, policymaking & administration.

But before being asked to undertake innovative work all the staff of the project team will have to undergo initial & induction phases of the staff development programme.

Initial phase will introduce the staff in lead centres, polytechnics & directorates & state boards to the related disciplines of psychology of learning, developmental psychology, group dynamics, Educational Technology, Curriculum development, institutional development, state level educational planning & management & equip them with professional terminology.

Equipped with this terminology, every fresh entrant to any cadre (lecturer, HOD, Principal or Educational Technologists etc.) will be provided 'Induction' to enable them to interpret the 'current' educational practices in the polytechnics, Directorate & State Boards in terms of the professional terminology acquired during the initial phase mentioned above.

This will be followed by 'in-service phase' of staff development in which project teams described above will be involved in learning new skills through on-the-job innovation projects. This in-service phase will enable them to acquire all cognitive, physical, interpersonal & attitudinal skills needed to improve teaching, curriculum management & institutional development qualitatively.

"Educational Technological intelligence" will be thus acquired by both the 'line' (lecturer, HOD & Principals) as well as "staff" Functionaries (Educational Technologist, Curriculum specialists) etc. of the organizations within the TES of Maharashtra.

Conclusions

Attempting to improve systemwide the quality of teaching, curriculum management, institutional & state level policy- planning & management will only be successful if there is a state level strategy for educational development. This paper tries to explain one of the possible strategies. The ideas expressed above are always subject to modification as we go on gaining experience during the implementation of the WB project schemes.

References:

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 3. M.O.E. Maharashtra State Project Report for the WB Project on the

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4. O.E.C.D. Conditions of Success for Technology Tranfer 1971, Paris : Unesco.

The teachers should be running stream and not a stagnant pool of knowledge. Each teacher must be fully aware about his surroundings, Socio-economic developments in the society and about how thoughts emerge. A teacher in tertiary education is a hub in developing potentials of human mind and can contribute only if hi is fully developed as an intrated personally,

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■ **Note** : This is the transcript of the lecture delivered by the author during the workshop on " Lead Centre" organised by TTTI Bhopal on 29th to 31st January, 1991, for Principals of Lead Centre & Regional Officers of the DTE. Ideas expressed here donot necessirily reflect the views of the Directorate of Technical Education, Maharashtra State.

INVENTION

Initiated in

Resource System Like

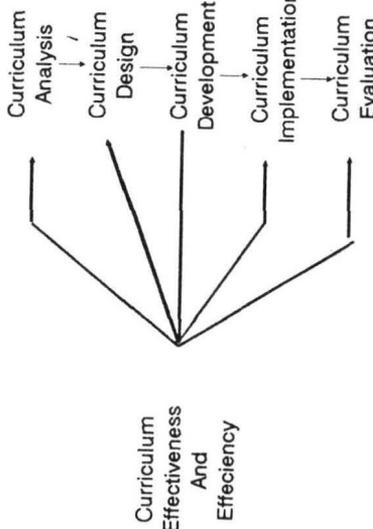
- TTTTIS
- IIIS
- IIIMS
- Universities

INNOVATION

Pilot testing for
Adaptation to Practice
in

LEAD CENTERS

One in each region (for
better product & processes)



Curriculum
Effectiveness
And
Efficiency

**EDUCATION TECHNOLOGY TRANSFER
AND
STATELEVEL STRATEGY OF
EDUCATIONAL DEVELOPMENT**

- Industry Institute
- Interaction
- LRDC/LRUC
- Computer / MIS
- Staff Development
- Modernisation
- Students' Learning
- Teachers' Teaching
- HOD's Curriculum Management
- Principal's Institutional Development

DIFFUSION
For Adoption
Adopted Polytechnics &
Other Polytechnics

Resource System Faculty

- subject Matter Expert
- Industry Representative
- Edu. Tech./Curri. Dev./Org. Dev. Expert

Staff Faculty

- Educational Technologist
- Curriculum Managers
- Organizational Development

Line Faculty

- Principal
- Head of Department
- Lecturer

Which need to develop Educational Technological Intelligence through three phases of

STAFF DEVELOPMENT

