# 3. MAHARASHTRA DESPERATELY NEEDS WORLD CLASS TECHNICAL UNIVERSITY TOP POLICY ISSUE OF 2010

*B M Naik*, W S Kandlikar***

***Technical University assumes a key role in global economic systems, where new knowledge and new technology, as well as highly skilled people, are perceived as fuel for economic development.***


## *Abstract*

*The paper presents, in brief, the need and importance of world class technical university for the creation of the future of people of Maharashtra. It outlines new visions and new missions for the university, in the global context. Technical university is different from traditional university, in the sense it is enterprising, oriented to technology and industrial development. It generates and disseminotes new knowledge in emerging technologies. It is a spearheaded organization promoting employment in Hi-Tech of high income.*

*The paper states that Maharashtra desperately needs, not one, but four technical universities that too of world class standard. This is essential to win in global competition, and to fulfil the rising aspirations of people. Technical university takes technology to vast masses, and maximises its social impact.*

*Transnational intellectual inputs, as well as experiences in establishing universities from within India and abroad, are critical. The universities should essentially be enterprising, relevant, and purposeful for near and distant future. The universities should be enterprising doing teaching, research, innovation etc, what the counterpart universities in developed countries do. What are the world proven policies and practices, and how to bring them? The paper explains.*

*The technical universities will have to be competitive not only by local standards but by international. They should be able to upgrade the standard of education in all the engineering colleges, in urban as well as rural. The design of the university should be such that it should not be just an examination body but doing multifaceted activities like research, innovation, technology transfer, patent & IPR, and spinning off new technology based companies, entrepreneurship by adopting PPP mode. The universities should add value in colleges. How the universities can become world class? No doubt, it is a long journey, but the route chosen has to be right. The paper identifies factors which when attended enables University to become world class.*

*Each university should have an innovative character. It should help industry to win and become a* ***"light house"****. It should be compatible to globalization. It should be adaptive to cope with changing*


**23, Mehernagar, Garkheda, Aurangabad-431005, **DOEACC Centre, Aurangabad.*

*situations especially in industry, from time to time. If the concept and design of the university is right, it will be easy during implementation. This is a very important project bringing high returns to the economy and securing the future. Now is time for Maharashtra, to aim high. Low aim is a crime. It is too late; but better late, than never; more than ten years before AICTE/ UGC recommended. It should now make a jump start by establishing not one but four World Class Technical Universities. The paper explains how to go about.*

## 1. Need and Importance:

Need and importance is already realised in Government and in academic circles. As such, there is no need to justify again. However, the following survey may infuse confidence.

**Survey conducted:** An opinion survey was conducted in the year 2004, in which 148 out of 150 institutions responded. 90.30 % of the respondents gave opinion in favour of the creation of the technical university. 95% expressed that the present multi faculty universities do not make any value addition in technical education; rather they are a hindrance in reformation. Efforts being made by engineering colleges to improve quality of education, therefore, do not bear fruits. In spite of efforts, and huge investments, only 30% graduates are employable. Education system is like a black hole, in which too much is going in and too little is coming out. Our students and teachers are working hard yet they remain unemployable. Partnership with foreign universities is recommended by 87.68%. 93.48 % desired partnership with IIT. Majority felt that if we do not improve well in time, foreign universities will enter India. They will find it easy to displace Indian institutes and capture education market. Economy of Maharashtra will cripple, if engineering education does not improve. 94.20% expressed that state budget is too inadequate and should increase. Technical education is a wealth generating mechanism, for it increases competency of people to better utilize available physical and financial resources. 90.58 % expressed the need of compatibility between industrial development policy and technical education policy at state level. Technology is energy giver. Use of superior technology is most important ingredient of economic success. Hence is the importance of technical university. The present universities are bogged down under the pressure of other faculties.

**Where does Maharashtra stand in industrial competitiveness in India and the world?** Where was Maharashtra in the recent past and where it is tending to go? Mumbai-Pune belt is moderately developed but what about Marathwada and Vidharbh? Where does Maharashtra stand in Foreign Direct Investment and Human Development Index? How many technologies Maharashtra has pioneered? How many technology brands have come out of Maharashtra? Unfortunately, Maharashtra is slipping down in all above parameters. We are distinctly a technology follower and not leader. We are progressing but other states are developing faster, leaving us behind. This fact deserves to be noted and acted upon. From experience in the world, University, in general and technical university in particular, is found to be in driver's seat for development. States develop faster, where technical universities exist. To make the state industrially more competitive, it demands establishment of a technical university/ universities. Germany, Japan. USA developed because they have more of technical universities.

**How many?** Only one university for more than 270 affiliated colleges is too unwieldy. Besides, this leads to monopoly. Monopoly is too bad, for it promotes inefficiency. So it should be avoided. One university then becomes a mere corporate office, bossing over colleges. This

puts scholarships, experimentations and innovations on back seat. Two or more universities make them sizable and handy promoting competition which is so essential for quality education. In a monopoly university with too many colleges affiliated, response ability to changing environment becomes less, which reduces the chance of success. We should not build today an outdated university, which is handicapped right at birth. Really to do justice, we need four technical universities, first in Vidharbh, second in Marathwada, third in Konkan, Fourth in western Maharashtra, like the agriculture universities. Should we not take a jump start in creating four technical universities? Germany, roughly of the size of Maharashtra, has 84 technical universities. Four is too small by that standard. Creation of universities would certainly cost but the cost of not creating is much higher, ten times more. Who pays for blunders? In ultimate analysis, it is the people. The rate of return on investment to the state is reported to be of the order of 60%, which very few projects yield. To keep the cost of establishment low and avoid delay, existing government colleges in four regions which have unused land, may be chosen to accommodate universities. This will give a head start to ensure success.

**Maharashtra state desperately needs world class technical universities:** Knowledge is power. It is realized that now economic development is knowledge driven, for it changes lives of people. Hi-Tech industrial complexes elsewhere in the world are growing around knowledge centres. Knowledge society, world over is being aimed at. Questions are being asked, where does India/Maharashtra stand in world list? Why thousands of students every year go abroad? Many go for post graduation and doctorate. These are our weaknesses. Yet, India is aspiring to be a world power? Maharashtra desperately needs world class universities. Otherwise, the state is destined to lag behind, to be a developed nation/ a developed state will remain just a dream. Can we conceive and make technical university/ universities world class? The younger generation, needs it badly. If we do not make, the younger generation will not pardon us for this strategic failure. We should not create mediocre universities when creation of world class is possible. Mediocrity is much more costly.

**International Experience:** Michael Porter in his book "The competitive Advantage of Nations" based on studies in ten developed countries, wrote that countries, industrially are more advanced, which have emphasized engineering education. Secondly, those nations are more advanced which have more of technical universities. Thirdly, the model of technical university is more productive and effective for technical education than a comprehensive or multi Faculty University. Fourthly, the nation which remain in network, share research projects and findings, provide access to young scholars, is more advanced. Germany, USA, Japan have more of technical universities than multi faculty. Technical University is a spear headed organization and hence found to be more efficient and more effective to educate people in emerging technology. Scientific and technological capability of people is an important factor in taking the state on the path of industrialization. This, in turn, leads to more employment, more income.

**Can Maharashtra become technological power with Mediocre Technical Education?** Leadership in various professions, industry, politics, society and all walks of life depends to a great extent on the quality of education. Leaders of tomorrow, who would be the movers and shakers around the world are strolling today in quadrangles of institutes. Thomas Jefferson, founder president of USA said, so as to become economic world power, first a nation would have to become leader in education, more so in technical. Only those nations, who succeed, tend to become world leaders. World class universities in any nation are, therefore, critical to well being of people. They are of vital

importance to Maharashtra's progress and prosperity. Seeds of leadership are sown within the four walls of class rooms. Planners and administrators should bear this in mind while deciding on investment on technical education.

**Efforts being made by India are commendable:** Reformation in universities and colleges in India is high on agenda. According to the recommendations of National Knowledge Commission [2006-7] and Yeshpal Committee Report [2009] attempts are being made to enlarge Gross Enrolment Ratio, achieve excellence, and make education inclusive. New IITs, IIMs and many more universities are being set up. Foreign universities are being given entry on Indian soil. TEQIP-I & II are making a good value addition. Maharashtra should have to contribute to take India ahead, for which enterprising technical university is needed.

**Opening more colleges is necessary, but not enough.** Critically important is starting technical universities to make private colleges more successful. Bringing of world proven policies and practices, systems and procedures to the university and colleges, is the crying need. Learning from world experience, it is necessary to reframe the visions and missions and link them up with institutional programs. Questions are asked whether the institutions will adapt to include, technology generation, technology transfer, technology innovation, creativity, patent& IPR, spinoff of new technology based firms, corporate development in their visions and missions. The paper gives a suggestive list of strategies which when followed will enable the university to be competitive, internationally. Many institutions in India are planning to jump up to higher orbit. To enable an institution to become world class, requires change in policies and change in style of governance. How to go about? Technical university is the right agency to guide.

**Student learning should be at the heart of university:** The higher & technical education institution, in the coming time, although will undergo substantial changes, driven by new learning technology, harsh financial constraints, changing public demand, globalization and growing intellectual opportunity, it must keep learning and especially student learning at the heart of its mission. Creativity, innovation, discovery, patent & IPR, spin off New technology Based Firms should have to become the new targets. Campus of today indicates larger society of tomorrow. With this in view, institutes need shaping.

## 2. Visions & Missions:

- To improve quality, relevance in all the colleges in the state, should be the mandate.
- Important vision should be to Link technical university with R & D centres in industry, in Government, CSIR labs by structural arrangements. They should sign MOU and exchange chairs for each other. An institute cannot survive and grow in isolation. .
- The university should not become boss of colleges but facilitator to improve them. They should lead by virtue of knowledge and not by authority. It is a difficult job but essential.
- It should add value in every college, in every individual faculty and staff. Every individual working for university must be upgraded in terms of knowledge and skills to higher level; he/she is capable for.
- Besides updating syllabus and conduct of examination, it should envision new activities which universities elsewhere in the world are doing.
- In 2010 a university should not be fit for 1990, but fit for 2050
- It should essentially use world experience in its design of systems and procedures, policies and practices.

## 3. Policies and Practices

- It should essentially focus on creating new technology based firms. It should have an enterprise development centre.
- It should generate new knowledge and new technology, like well water springs.

- It should have special department for technology transfer, knowledge transfer.
- It should establish patent centres in various colleges
- It should establish Research Parks
- It should establish Technology Incubators, business incubators
- It should enable colleges to be autonomous
- It should create conditions favourable for dedicated faculty in all colleges
- It should design schemes to make commercial exploitation of technologies
- To bring investment in all colleges
- University should help every professor to be more productive.
- To change mindset of people in governance and leadership of colleges
- To collaborate with best in the world
- To improve quality of BE, ME, and PhD courses
- Coordinate with private education providers and users, world wide
- To improve research output
- To bring best from outside and provide to colleges
- To make innovation fund available in each college
- It should depute faculty and staff to places where can learn world wide
- It should design world class organization structure
- It should be a decentralised model

***How world class universities are set up elsewhere in the world?***

Establishment of universities even in developed countries like Limerick University in Ireland and Harburg University in Germany and many more elsewhere in the world have been set up under the close supervision of world best professors in world class universities. From very beginning these universities are associated with almost 15 world best professors. They supervised them from their respective universities and visited frequently to plant high class academic culture. The author has personally visited them. From day one, they started with Research Park, incubator centre. Frei University in Berlin was set up with innovative ideas. Here the university purchased existing residential colonies along with existing telephone lines, electricity, water supply, drainage, roads etc. This saved lot of time, the university could begin instruction quickly. Should we not show imagination in adopting strategies to get head start?

IITs were designed as world class institutes. From the beginning, world best institutes in countries like USSR, Germany, UK, USA were entrusted the responsibility to install them. They remained under foreign collaboration for 20-30 years. Exchange of faculty, research collaboration, world class systems & procedures gave them global orientation.

**Vector Direction of the university should be right.** Today, in the absence of technical university, the vector direction of higher and technical education is misplaced. It needs immediate correction. Without which the people below poverty line, will keep on increasing. In archery test, while hitting the eye of parrot Arjuna was asked by Guru Dronacharya what do you see?. When he said 'I see; only the eye'. Then guru asked him to shoot. The direction of the arrow was right. It was not with high speed, or high force.

How would the winning institution in coming time look like? What characteristics university should have? Characteristics as under will enable the university to win; others may work hard, may have all the resources to draw on, but will lag behind in international ranking. An attempt should therefore be made to change mindset and to acquire following characteristics.

## 4. What Makes Technical University World Class?

Those who care for the following tend to become world class

- Technical university can be world class only if it maintains institutional autonomy for self and grant autonomy liberally to affiliated colleges, maintain lively faculty, interdependence, and academic freedom, but should have strong, impartial, public governance and committed leadership. Professors ought to have freedom to be innovative and creative. Autonomous status is a prerequisite to succeed.
- Technical university can be world class only if it is compatible to opportunities and challenges in globalize world. A conscious effort will have to be made to align university to world dynamics, and quality demands of globalization. This essentially demands intellectual, and systems input from world over.
- Privatization is certainly good. Association with private agencies is desirable. Technical university will be world class if it has the skill to carry partners with, and adds value in them from time to time. However, there are certain risks which need to be guarded. Governance and leadership in university and colleges would have to show statesmanship.
- University can be world class only if it builds a synergy between university/ college and industry. University will have to initiate program for commercialization of technologies. It needs to install on campus, units like patent centre, entrepreneurship, spin off of companies, innovation centre etc. Only pumping more money is not enough, it must be accompanied by innovative activities. Universities have become world class in developed countries by adopting these strategies. NKC has recommended the units as integral components.
- The technical university will have to be campus rooted but internationally oriented. Professors and others would have to have international mobility. If the mobility is too less like in the past, university and colleges cannot become world class. Cost of not granting mobility is too heavy, generations are left behind.
- Universities which welcome and operate on public private partnership are more likely to become world class. Authorities would have to be more professional in working. Independent, disconnected working from world, leads to failure. This is too costly for the people.
- The successful university will be that which is knowledge based but student centred, research driven but learning focussed. They are expected to develop students as pace setters, path finders, and leaders not followers.
- The successful university will be that which along with colleges contribute to produce new technologies, new products and processes in its laboratories. They should not be sterile to test what is discovered elsewhere. University and colleges should aim at producing pioneering leaders in industry and leaders in technology. If they produce technology pioneers they will be world class.
- The successful university and colleges will be those who include corporate development in their vision and mission. Technical university will be successful if it provides new technology to industry, besides competent manpower.
- That university which produces balanced output of BE, ME, PhD, is likely to succeed more. Japan and USA produce 30 PhDs per million populations, where as India produces only 0.5. Can we ever win in brain race and become world class with such a low figure of PhDs?
- The technical university will have to be quality obsessed but procedurally efficient. It must follow TQM to make most of resources yet achieve targets. Otherwise, resources are wasted and targets missed.
- Technical University and colleges should jointly undertake installation and running of research parks, incubators, patent centres etc under PPP mode. This is so essential to become world class.

- University will be successful if it contributes to uplifting of skills of vast masses. Continuing education programs are needed for working engineers
- Institutions will be successful which identify internal weaknesses and attempt to remove. Evaluation of university and its all activities need to be done, regularly, from time to time, by an independent professional agency.
- The university will be world class only if it replaces the traditional bureaucratic model of governance and management and creates an atmosphere of trust and confidence. Professors require almost no supervision. Bureaucracy in academics is not relevant today. Break through ideas emerge in free environment. They are a wealth of university.
- Technical universities should view professors as researchers, innovators, discoverers and creators. They should be enabled to grow to the level they are capable for. They are great force in pulling the nation forward. They are an insurance against obsolescence. How many have written books, obtained patent & IPR? It is only then that they can inspire youths for creativity.
- That University will be preferred by students which adopts modern technology like telecommunications, computer, blending of distance mode etc in teaching and learning.
- University will be world class if it installs a technology transfer office, to carry the new technology from lab to land. SSI, SMEs who can't have R & D units need brand new technology to keep them competitive in global competition.
- University authorities who adopt global mindset, global perspectives attract talent and scholars. They are like a magnet to attract brains.
- University which harnesses the strength of their alumni, makes the university world class. No world class university exists without active alumni association. Alumni are ambassadors who bring fresh ideas and more funds to the university. So much is demanded from the university that all alone it cannot give. It must be backed by ideas from alumni. They are like the sons and daughters in a family.
- University could be world class which adopts flexible rules and regulations, current strategies. That institution which creates VCF, innovation fund for students is more successful. Just putting more money or more men on the job does not make a university world class.
- University could be world class which manages its development projects in an integrated manner. Piecemeal approach in organization leads to wastage of time, effort and money, besides missing the target. Scientific approach in project management is essential.
- University will be in top demand which considers teaching and research as inseparable. Every teacher is a researcher, and every researcher a teacher.
- University will win in global competition which focuses on "education for all, life long, nonstop, for everyone". Earmarking adequate budget for knowledge transfer to common man should be its priority.
- Last but not the least world class university will be that which will nurture entrepreneurship so as to make youth global players.
- What then is the vision of the technical university? The vision is to become a fountainhead of new knowledge, new technology, and a well spring generating and disseminating new technology to human kind all over the world. Maharashtra desperately needs such world class universities. Brave new Maharashtra will be created in these temples of knowledge.

## 5. Conclusion

Government is actively thinking on establishing technical university. Government deserves complements.

Government should however constitute a

committee involving leaders in industry, and leaders in academics, preferably from world class universities in India and abroad.

Establishing not one but four technical universities is recommended. This has strong implications to create bright future for Maharashtra. More accessibility to high quality education leading to balanced output of BE, ME, PhD means higher industrial competitiveness, higher employment of higher income.

MNCs are starting R & D centres in Maharashtra, with world class research infrastructure. They are collaborating with quality institutions like IIT. With the increasing usage of advanced technology in industry they need talented engineers with innovation skills. From where will they get? This is an opportunity, which Maharashtra should harness.

Talent is ample; they need swimming pool to learn swimming, meaning that they need technical university for making most of their brains. Engineering career is now most exciting, and to make most, world class enterprising technical universities are desperately needed.

World experience tells us that regions / states/ nations develop faster which have more of technical universities. They are the spear headed organizations which turn intellectual strength in to marketable commodities. They stimulate economic and industrial development. They generate jobs of high pay, high quality on global plane. They are an insurance against obsolescence. They offer the much needed economic security.

The technical university needs to be conceived and designed such that it is competitive by international standard. We should not build in 2010 an outdated university, a university of say 1990. It should be fit for future say 2050. The stakes involved are very high. The rewards from university are high. So also the penalties for not providing are ten times higher.

Hence on priority four technical universities in four regions should be set up, each of world class standard. Without them Maharashtra is destined to lag behind. The cost of world Class University is high, but mediocrity costs much more.

The university to be purposeful should structurally be brought in network with counterparts in India and abroad. It should follow a decentralized model, preparing the mindset of affiliated colleges for autonomy. It should be adaptive, changing with time.

Faculty, staff, administrators need mentoring to translate education visions, policies in to effective practices. Outstanding leadership of chairman, principal and trustees in this cause is vital.

Quality of Technical education in Maharashtra today is far too low by international standard. Should we not envision, when the whole world is going for world class? Are we not capable for? Low aim is a crime. Without it consider the possible damage? Who pays? To improve quality, do we wait for foreign universities to come in?

**References:**

1. The role of American university, the creation of the future-Book by Frank Rhodes, published by Cornell University press, 2001
2. Rising above the Gathering Storm, book published by National Academy of Sciences, US 2007
3. National Knowledge Commission Government of India, 2006-07
4. Yeshpal Committee Report, Government of India, 2009
5. Naik B. M. 2004, Technological Innovation in Educational Institutes, The journal of Indian Technical Education, Vol 27, No 2, pp 59-60
6. B. M. Naik & W. S. Kandlikar, "Global Visions

& Missions in Technical Education" 2008.

7. Charles M Beach, Robin W Broadway, R Marvin (Editor) Higher Education in Canada, Queens University, Canada.

8. Technical education quality improvement program [TEQIP] Phase-II, Project Implementation plan, government of India, October 2009.

9. B. M. Naik and WS Kandlikar, "Expanding Horizons in Higher & Technical Education- To Adopt new visions of new world- a Challenge", published in i-managers Journal of Education technology, Volume 6, No 2,July September 2009, pp20-28.

10. University of Toronto Research Park- MaRS in Toronto, Canada - *Great minds meet at "MaRS" centre- taking innovation to world*

11. Glen A Jones, Patricia L McCarney, and Michael L Skolink, (Editors) " Creating Knowledge, Strengthening Nations- The changing role of higher & technical education, Toronto University Press 2003.