Innovation In Management Of Technical Education

Arun Kumar Agarwal, Associate Professor, DLPIMT MBA College, Himatnagar, Gujarat
Dr. M. Samir Gopalan, Associate Professor, Smt KK Patel MBA & MCA College, Patan, Gujarat

ABSTRACT
Management and Technical education has entered a period of profound transition driven by globalization, technology, demographics, and pressing social imperatives. Because management education is an investment in the future of business, it’s important to understand the challenges, opportunities, potential risks and rewards associated with this transition. Therefore, this report was created as a resource for leaders in the global management education community as well as business and government leaders, policy makers, and others who want or need to understand the global issues and challenges facing the complex, dynamic world of management education. For these leaders, we seek to provide a foundation for constructive dialogue, mutually beneficial collaboration, and investments in the future of management and technical education.

Keywords: Collaboration, Community, Education, Leader, Transition.

INTRODUCTION
The whole process of innovation in management and technical education is where people get an idea and put together a team, raises the capital, create a product and mainstream. The Indian Space Research Organization — is the result of Dr Vikram Sarabhai’s vision. Its first rocket, like the one in the picture, was launched 40 years ago. Over the past 40 years, a multidisciplinary group of electronics, mechanical, electrical, civil and chemical engineers has designed and built 32 satellites and three generations of launch vehicles culminating in the GSLV. This was done with almost totally indigenous R&D, battling US sanctions. Each time that a technology or component was unavailable; ISRO went ahead and developed it on its own. ISRO’s satellites help India in telecom, television broadcasting, weather forecasting, disaster warning, telemedicine, education and fishery. Technologies in areas as diverse as optics and artificial limb manufacture have been developed and transferred to Indian industry.

REVIEW OF LITERATURE
The right example of innovation viz; Jamsetji Tata wanted to make textiles in Nagpur in the 1800s with the cotton grown there, Nagpur had no textile industry then, and in Manchester Jamsetji was told that Nagpur’s weather was not suitable as it was too dry. He said, ‘Alright, I will bring the Manchester weather to Nagpur.’ He imported humidifiers and started India’s first textile mill in 1874. When Jamshetji started the Tata Iron and Steel Company and wanted to export steel rails to Britain, a Britisher called Sir Frederick Upcourt said, ‘Do you mean to say that Tatas propose to make steel rails to British specifications? I will undertake to eat every pound of rail that they make, if they do that.’ The Tatas did manage to make steel rails and export them to Britain. In World War II British tanks were called Tatanagar because the steel was made in Tatanagar.

To paraphrase Nilekani, Vikram Sarabhai and Jamsetji Tata got an idea, put together a team, raised the capital, created a product, and mainstreamed it. They did it sitting in India, 40 years and 125 years ago respectively, when India’s technical capabilities were far less than they are now.

What do global giants like General Electric and Motorola have in common with a humble Tiffin delivery network comprising 3,500 dabbawalas who deliver 150,000 lunch boxes to citizens in Mumbai each day? The dabbawalas have the six sigma rating or an efficiency rating of 99.999999, which means one error in one million transactions. This rating has been given to them by Forbes Global, the famous American business weekly. Now, these are largely illiterate dabbawalas. Their secret lies in a coding system devised over the years. Each dabba is marked in an indelible ink with an alphanumeric code of about 10 characters. In terms of price and the reliability of delivery, say compared to a Federal Express System, dabbawalas remain unbeatable.

Isn’t it great to note such a great Indian innovation invented by some non-IIT/non-IIM educated, rather a very little literate group of Indian brains. Arindam Banerji also wrote an excellent comparative series on the much hyped Indian IT industry which is truly thought provoking – Politicians, bureaucrats and residents of Bangalore take pride in the fact that they live in what they call the Silicon Valley of the East. The city is considered high tech because of the number of software and software services companies located here.
NEED OF THE STUDY

In 1933 Frederick Terman, a professor of engineering at Stanford University, mentored two undergraduates named Bill Hewlett and Dave Packard, and was instrumental in getting them to start a company. They went on to form the company Hewlett-Packard. This was the first seed from which Silicon Valley grew. Today around 2,000 electronics and information technology companies, along with numerous services and supplier firms, are clustered in the area.

Silicon Valley contains the densest concentration of innovative industry that exists anywhere in the world, including companies that are leaders in fields like computers, semiconductors, lasers, fiber optics, robotics, medical instrumentation, and consumer electronics. Some products that went from dream to reality in Silicon Valley are the first video game, the ink-jet printer, the video recorder, the mouse, the personal computer, and much else that we take for granted in the information age.

If you ask the president of any of Bangalore’s software development companies what his company does, he’ll say “We provide end-to-end solutions for Xxxx.” Xxxx could be any or all of these — e-commerce, banking, telecom.

What he means to say is this: ‘We’ll do the software coding in any of these areas for you. Just tell us what you need. We have a huge mass of engineers who know various programming languages.’ These companies do not develop any technologies or products. They provide development services. They have engineers who specialize in programming languages rather than in technologies.

A typical engineer in these companies has no specialization in any technology. He does not use his engineering knowledge. You could say his body is employed, but his brain is severely under-employed.

The comparison Arindam Banerji wrote, if you are from Delhi or Mumbai or Kolkata or Chennai or from a smaller town and encounter a Bangalorean ‘techie’ spouting off about his work or about his Silicon Valley, you no longer need to develop an inferiority complex. Banerji addressed the so called Silicon Valley of East Bangalore as Collie Valley. He read his comparisons which are real and practical.

Coolie valley companies are based on ‘know how.’ They do the software coding for other companies that have the ‘know what.’ If you tell them what to do, they know how and will do it for you.

Silicon Valley companies invest huge sums of money on R&D. They generate new ideas and are constantly developing new ways of doing things. A typical Silicon Valley engineer is a specialist in a particular technology, like inkjet printing or virus detection. He spends all his life working in this technology area.

A typical Coolie Valley engineer is a specialist in a few languages. He is not concerned about the technology that he is working on and is willing to develop any software with the languages that he knows.

A typical Silicon Valley engineer’s education and work experience all relate to a technology. When he changes jobs, he changes to another company working on the same technology.

The Information Age demands transformational initiatives. The pursuit of technological transformation in higher education has become widespread in Africa with the extensive pervasiveness of global networks like the Internet. The current focus of technological transformation in education seems to be centred on the use of the Internet and intranets, which is also referred to as eLearning. This paper, therefore, deals with instructional technology diffusion, with a focus on eLearning as a type and a central focal point of modern technological transformation in education, which has enormous potential to provide new connectivity and access for Africa internally and to the rest of the world.

STATEMENT OF THE PROBLEM

Some aspects of technological transformation that stood out at Massey University, Cape Technikon and in the last two years at the university of Botswana are discussed below within the framework of the literature on technological innovation in education and the management of the change process. There is no neatly formulated theory of generic change. Cannon (1986) further points to the absence of a general theory of educational development and notes that educational developers therefore draw on theories from other disciplines to inform their educational practice. Higher educational institutes in general are very conservative and have been highly resistant to change and reform over the centuries (Evans and Franz, 1998; Richardson, 1979).

Educational institutions in general, ‘which exist to open minds and challenge established doctrine, are themselves extremely resistant to change’ (Robbins and Barnwell, 1998). Higher education can be described as largely bureaucratic and ‘bureaucracies by definition resist change’ (Tapscott, 1996, p. 36). The inherent aversion to change means that the concepts ‘top-down’ and ‘strategic’ need to be interchangeable for diffusion to be effective. Technological innovation has often been implemented as an isolated, bottom-up initiative of academic staff for efficiency purposes. In this scenario, the wider systems within higher education are often not
considered and neither affected by the innovation. The management of an institute may thus feel justified in disregarding the innovation. Systems theory calls for an integrated approach to technological innovation: ‘a system is a whole that cannot be taken apart without loss of its essential characteristics, and hence must be studied as a whole’ (Ackhoff, 1972, p. 40).

At Massey University, the President served as the sponsor of the project but the project was not viewed as being of strategic importance, which led to limited diffusion. At both Massey University and Cape Technikon, however, the level of resources made available would not have been possible without senior management and middle management support. Furthermore, when typical political problems like irrational resistance to change were encountered, senior management was able to step in and direct matters. At Cape Technikon, where the initiative was regarded as one of strategic importance, the top-down strategies included the creation of a widely owned strategic plan that included a clear and unified vision, having the Vice-Rector as sponsor and a task group with wide and senior representation as a sub-committee of Senate.

OBJECTIVES

The Information Age demands transformational initiatives. The pursuit of technological transformation in higher education has become widespread in Africa with the extensive pervasiveness of global networks like the Internet. The current focus of technological transformation in education seems to be centred on the use of the Internet and intranets, which is also referred to as eLearning. This paper, therefore, deals with instructional technology diffusion, with a focus on eLearning as a type and a central focal point of modern technological transformation in education, which has enormous potential to provide new connectivity and access for Africa internally and to the rest of the world. The ideal is for Africa to grow its own best practice models for eLearning through creative grassroots initiatives, imaginative improvisation and contextualizing of best practice models from elsewhere. The realities of Africa need to be addressed if the ideals of using eLearning in teaching and learning are to be realized within the framework of the technological transformation of higher and tertiary education in Africa. There are many aspects of the socio-economic and technological environment taken for granted in developed countries that need to be explicitly addressed during technological transformation in developing countries such as Botswana and the rest of Africa. These include, among other things, inadequate telecommunications infrastructure, lack of reliable power supply, the education sector competing for limited resources, a need to provide basic educational facilities, and reducing the student: teacher ratio to acceptable levels for effective learning. Many improvisations and special interventions are required and will need to be developed to address these issues. Technological transformation in general and eLearning in particular has major systemic implications and needs to be carefully managed as Drucker (1998, p. 100) points out: ‘as soon as a company takes the first tentative steps from data to information, its decision processes, management structure, and even the way it gets its work done begin to be transformed’. Attempts to introduce any significant reform will impact on all of its sub-systems. Bates (2000, p. 196) contends that ‘using technology to extend the campus on a global basis will affect all aspects of a university or college, but particularly administrative systems’. Fullan (1991, p. 349) refers to the necessity of looking at innovations within the framework of institutional development. The systemic nature of transformation related to the wide and effective use of eLearning calls for a managed process to introduce this innovation in higher education in Africa. Thomas et al. (1998) have argued for a transformation of practices (both teaching and administrative) in order to take advantage of technology so as to provide the needed functions, rather than superficial translation of existing practices. Bates (1999) argues that the introduction of eLearning will prompt a thorough re-examination of the core practices of an organization, whether advertising, or registration, or design and delivery of materials, or student support or assessment of students, in order to arrive at the most effective way of providing these services in a networked, multimedia environment. Managing change in general and in higher education in particular is, however, problematic and it is therefore necessary, as Fullan (1991, p. 350) suggests, ‘that we explicitly think and worry about the change process’ in educational reform.

FINDINGS

The findings in these two cases suggests that Rogers’ (1995) diffusion of innovation theory – when the innovation emerges from outside of senior management – needs to be augmented with a top-down component that includes both senior and middle management in order to accomplish effective diffusion of technology based education. This is a central finding by Dr Uys’s doctorate research and the resultant LASO (Leadership, Academic & Student Ownership and Readiness)
Model for Technological Transformation in Tertiary Education that he developed (Uys, 2001), which was primarily based on these two cases. The LASO model includes the necessary top–down, bottom–up and inside–out dimensions in the diffusion process. The LASO model (see figure 1) also attempts to address the wider context in which this transformation would take place within the ‘Strategic Framework’ namely the external technological and socio-economic environment. The LASO Model emphasizes the importance of integrated top–down, bottom–up and inside–out processes. This model suggests that technological transformation occurs when leadership is integrated with academic and student ownership and readiness. Leadership is achieved through mechanisms such as defining a clear vision for the transformation, providing a reward structure for those engaging in the change process and the creation of a strategic framework to guide the transformation. Ownership and readiness for change by both students and academic staff can be achieved by using strategies such as pilot projects, extensive training, establishing workgroups in every faculty/school and using teams for courseware development. The curve of technological transformation is indicated in the LASO model as a ragged line to signify the complexities and dilemmas with which technological transformation is often associated.

CONCLUSIONS

Being honest, the state of much hyped Indian management education is even down under the Indian technology education. Management education is an investment in the future of business, it’s important to understand the challenges, opportunities, risks associated with this transition. We seek to provide a foundation for constructive dialogue, mutually beneficial collaboration, and investments in the future of management and technical education. Innovation is one of the key drivers for sustainable competitive advantage, especially for technology-driven companies. The LASO Model for technological transformation in tertiary education that has emerged from the New Zealand and South African cases has been largely validated within the context of the University of Botswana. Technological transformation is still embryonic at the University of Botswana but is clearly gaining momentum through the integrated top-down, bottom-up and inside-out strategies being implemented within the framework provided through the LASO model. The culture and complexities of the University of Botswana also affects the political dimensions of this process and further impacts on expectations and targets. The analysis of these three cases indicates that technological innovations like eLearning need to be implemented within a strategically developed framework based on a clear and shared vision and a central educational rationale. The several multi-faceted challenges that exist and militate against the effective diffusion and adoption of ICT in developing countries should be taken into consideration. These have been categorized as being operational, contextual and strategic by nature and have been dealt with in the paper with the intention of adapting and diffusing ICT innovations to their optimum potential at the tertiary level in Africa.

REFERENCES

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