Chapter XVII

Digital Engineering Campus: Economics, Acceptance, and Impact

Milind J. Mahajan
Mirash Infotech, India

Sunil S. Umrani
Sunind Systems, India

Narendra S. Chaudhari
Nanyang Technological University, Singapore

Abstract

In this chapter, we introduce two existing web-based, e-learning approaches, and examine economic and social aspects of their usage in society. Specifically, we briefly introduce an e-learning initiative in Singapore. Secondly, we give a detailed description of a case study regarding the experiment called “Digital Engineering Campus,” which is an NGO initiative to provide supplementary educational facilities for engineering colleges in India. Considering the economic as well as social benefits, using our detailed case-study of Digital Engineering Campus, we argue that developing countries like India have tremendous growth potential in web-based education. Further, the experiences of developed countries with web-based education will prove to be highly beneficial for developing countries like India.
Continued growth of the education sector is very important for improving the standard of living. This sector becomes all the more important for developing countries. Motivated by the International Finance Corporation (IFC) and World Bank (World Bank, 1994, 1996), James Tooley reports factual data about 18 case studies of education projects in 12 countries (Tooley, 2001). A part of Tooley’s study also reports the use of Internet for teaching in India (Tooley, 2001).

Professor Roger C. Shank, in his excellent book, “Designing World-class e-Learning,” contrasts Internet-based learning with traditional, school-based learning (Shank, 2002). Shank coined the term, “learning-by-doing” for e-learning, and has given seven criteria for assessing the effectiveness of e-learning, specially focusing the freedom of learning. He provides in-depth observations of the e-learning instructional design process, delivery of resources, and accessing the utilization of e-learning resources. He has given concrete illustrations of these points by including the case studies of e-learning initiatives of IBM, GE, Harvard Business School, and Columbia University.

Computing and Web technology has caused widespread economic disruption, limiting growth in productivity (Brown & Duguid, 2000). For example, for the U.S.A., the multi-factor productivity growth rate (labor and capital taken into account) was 2.5% for 1984 to 1973, but it was only 0.7% for 1973 to 1990 (Brown & Duguid, 1996). To explain this phenomenon, the inventor of mouse, Douglas Englebart, states that, “Real social danger today is that the technology is erupting and moving so much faster than it ever has in all of our historical experience … time to start adapting society to this revolution in the technology. There is a lot of potential danger ahead if we do not adapt to it successfully” (Huges, 1986, p.599).

Business writers Downes & Mui (1998) define the “Law of Disruption” as, “social, political and economic systems change incrementally, but technology changes exponentially.” However, Brown & Duguid (2000, p.85) indicate the (future) emergence of new technology to adapt this: “…(e-) technology design has not taken adequate amount of work and its demands … (technology design) has aimed at an idealized image of individuals and information.”

Indeed, we see a number of attempts to achieve this goal. Due to influential web-based learning tools, we now witness emerging concepts of distributed intelligence, distributed creation and sharing of knowledge, formation of the social nature of learning ecology, and its social impact.

Singapore gives us a scenario of the fastest growth in the advanced world. In Singapore, the e-learning initiative is largely due to the push of government, and we very briefly comment on this scenario in Singapore, both at tertiary education, as well as primary and secondary schools.

Developing countries like India have tremendous growth potential. In such countries, the government-supported education system is slowly being supplemented by non-governmental organizations (NGOs). To illustrate the interplay of government as well as
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