

Building Quality Instructional Processes over Content for Effective Technology Enhanced Learning



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Prof. K.R. Srivathsan took over as the first Director of the Indian Institute of Information Technology and Management – Kerala (see www.iiitm.ac.in) since Dec. 2000. He is also Professor and former Head of the Electrical Engineering Department at the Indian Institute of Technology –Kanpur. He has a Bachelor degree from the Regional Engineering College, Durgapur in West Bengal, an M.Tech. from IIT Kanpur and a Ph.D. from Queen's University, Canada – all in Electrical Engineering. Earlier, as a Faculty of IIT Kanpur, he was instrumental in the development of many laboratories in Electronics, Test and Measurement Systems, Communication Systems and Networking, and advanced Instrumentation. He had been teaching and guiding research in the areas of Electronic Systems, Networking and Network Services, Communication Systems, Advanced Instrumentation Systems, Avionics and Navigation Systems. He was actively involved in conceptualizing and guiding several large projects such as the ERNET, Telematics, Power Distribution Automation, Educational Technology Services, and several others.

Prof. Srivathsan has been associated with India's developments in Networking, Internet and IT from early 1980s. He was a founding member and coordinator of ERNET in the 80s and early 90s. During this period, he was closely associated as a leading consultant in the pioneering efforts of setting up LANs and Internet services for many institutions and organizations. He coordinated the efforts of the Networks Group that resulted in IIT Kanpur becoming the first Institute in India to have an academic area LAN as early as 1988-89. This was the first multi-segment LAN that could

link the heterogeneous computer systems of those days. He has been a leading consultant in the networking of many academic and research institutions across the country. One of his significant work was the planning, installation, configuration and commissioning of a large multi-segment LAN and network services for the CAD/CAM and Computing team of Engineers and Scientists of the LCA Project under the Aeronautical Development Agency in Bangalore during 1990-92. He has been actively involved in the curriculum development of several subjects in IIT Kanpur.

As the first Director of IIITM-K, Prof. Srivathsan and his team established the hi-tech IT infrastructure of the Institute in record time and launched its postgraduate programme in IT by March 2001. Besides emphasis on IT, the programme gives thorough grounding in Information Systems Organization and Management. Under his leadership IIITM-K has been pioneering several developments in the applications of IT in Education, Knowledge Management, Enterprise Applications Integration, Digital Libraries, Distributed Information Systems and Technology Enhanced Learning and Teaching. In 2000-02, he guided a group of young professionals in developing a new technology class of advanced Education Servers and Enterprise Portals that support powerful **Knowledge Interaction and e-learning environment** over the web for groups and individuals in any local or virtual organization. This resulted in the first company Transversal E Networks (P) Ltd. (see www.transversalnet.com) being born out of IIITM-K. These new class of servers are now in use in several premier institutions, R&D organizations and industry across India.

Prof. Srivathsan conceptualized and now leading the Kerala Education Grid Project (see www.edugrid.ac.in) that aims to enhance the quality of higher education by linking the universities and institutions of Higher Education in Kerala through seamless subject-specific knowledge and collaboration networks. A significant new project that he gave shape and now leading is the Kissan (Farmer) Information Systems, Services and Networking (see www.kissankerala.net) that provides for strategy-focused knowledge management services in agriculture. Recently, along with the Trivandrum

City Police, he guided the implementation of an award winning and advanced Police-Community Interaction Portal (see www.tvmcitypolice.org) that caters to the multi-way interaction and knowledge management services for the city community and the police in security related matters of common concern. These efforts resulted in IIITM-K getting the prestigious status of the Sun Center of Excellence in e-Learning – the fifth such center in the world and the first in India.

Prof. Srivathsan is a member of the National Programme on Technology Enhanced Learning (NPTEL) that is funded by the Ministry of Human Resource Development and jointly run by all the IITs and the Indian Institute of Science. He is a Fellow of the Institution of Engineers India and a Fellow of the Institution of Electronic and Telecommunication Engineers.

Abstract

In a significant move to address the problem of shortage of quality teachers in the large number of engineering colleges across the country, the Ministry of Human Resources Development (MHRD) funded the National Programme on Technology Enhanced Learning (NPTEL: visit www.nptel.iitm.ernet.in) proposed by the IITs and IISc. Under the NPTEL initiative, nearly 350 expert-faculty from all the IITs and IISc have been mobilized to create content for the various engineering and science courses taught in the engineering colleges. The content is in the form of recorded video lectures of about 40 hours per full course in approximately 120 courses and in web-based form in another 100 courses. The faculty involved are among the most experienced and committed teachers in the different subjects. The subjects and syllabi in these courses broadly conform to those set by the All India Council for Technical Education (AICTE) with supplementary inputs taken from the syllabi of the Anna University and the Viswesvarayya Technical University. At least 80% of the courses are expected to be fully ready in their first version before the end of 2005. MHRD is expected to formally launch these courses for use by the colleges within the next few months.

The NPTEL development has largely been complemented by an independent Kerala Education Grid Project (visit www.edugrid.ac.in) of the Department of Higher Education of Kerala. KEG was proposed by the author and now coordinated by the Indian Institute of Information Technology and Management – Kerala (IIITM-K). The author is a member of both the initiatives. Detailed vision, objectives and approach of the Education Grid may be had from the papers downloadable from the project website [1,2]. The main aim of the Education Grid is to support the teaching in the colleges across the state by portal backed collaboration and discussions and teacher-training in the use of technology enhanced learning. Effectively. The Education Grid project is also working towards establishing the 'Virtual Learning Campus' [3] as a

networked education infrastructure linking all the colleges of higher education in the Kerala. Recently the state has also undertaken the large initiative of networking more than 200 colleges and support them through Education Grid services.

Having the twin experiences of NPTEL as quality content sources with experts back up and launching the Education Grid as quality education support system for quality instruction management in the colleges, it is important that we understand what quality educational or instructional processes are. Such instruction management is to be targeted at our country's higher education system deliver quality learning to all its students. In synthesizing the technology enhanced instructional support system, we have to keep in mind David Merrill's adage, "Instruction is not Information".

This paper is not about e-Learning technologies, reusable learning objects, SCORM, education servers, digital libraries and such other technology centric developments. It is about how we establish and manage quality instructional processes in the colleges through web-accessed resources and managing communities of practice among teachers in the different subjects, given that they will be linked over broadband networks and equipped with technology enhanced learning facilities.

We first review the basis of quality instruction in the light of how we use e-Learning content and advanced collaboration tools to support different learning experiences and management of instructional processes. It is also intended to act as guideline to the colleges on how we establish the different critical component processes and systems to support the same so that they and the higher education systems in the country will be able to manage such quality education processes even though they may have average or inexperienced teachers.

The paper recognizes that there plenty of content is already, or, going to be available and colleges are being increasingly interconnected through broadband networks backed by advanced information,

collaboration and computing systems. Given such a scenario, the challenge is to design and develop pedagogically effective instructional processes and manage learning experiences. These have to be done in ways that bridge the existing gulf between what is taught to the students in the courses and their capacity to apply them in addressing real-world problems and solutions. Our goal is to produce quality employable graduates.

The paper also creates a basis for managing instructional design and learning activities over technology enhanced learning environment in the different subjects using key principles of knowledge management, innovations driven learning environment (IDLE) and some well-known principles of instruction.