ABSTRACT

In order to shorten the learning curves in the formal and informal education sector and in addition, in various types of trainings as well, there is an urgent need to address the issue of efficient and effective time management. As the current systems have started to fall short in adhering to tight time schedules, the demand for 24x7 anywhere–anytime of studies/ learnings/ trainings is compelling. The role of ICT is indeed crucial in supporting this changing scenario. The developed countries across the globe have already taken lead in replacing the older ones completely or to say the least, in accommodating various new ICT based learning styles in the existing systems. This is true especially for their training sub-systems. These developed economies have also started to reap the rich harvests of these changeovers. But the developing countries are struggling hard to keep pace with those of their counterparts. They are entangled with the sets of problems of their own, finances being one of the most crippling factors among many others. Inadequate finances are one of the essential road blocks in such endeavors in providing the necessary ICT support including Internet and networks.

E-learning or electronic learning is the latest avatar of learning which is forcing its way into the realms of ages-long traditional teaching-learning system and is steadily creating and occupying its own space. It essentiality is a paradigm refining the education and training concepts based upon the extensive use of ICT in their creation, delivery, dissemination, assimilation and storage so that a new barrierless teacher-taught system can be put in place. The computer networks, the Internet and various communication techniques play a vital role in establishing such systems.

Simulation and modeling have been with us for quite a while and have been finding favor with the industry, researchers, practitioners, governments etc. in fulfilling their respective training and other needs. Of late, ICT has also created its own space within the systems of this field and computer based simulations are ushering in new vistas of opportunities within. Lots of research has already gone into and is still going on in both the areas of e-
learning as well as simulation but the literature is somehow devoid of any account of using the simulation in e-learning system for studying software engineering and management. The authors of this thesis work have thus proposed a simulation based e-learning in software engineering and management, supported by a tool for the students/learners that has been named Software Engineering Simulation based e-Learning Environment (SESeLE). We have collected the responses of different groups of students through 6 numbers of questionnaires before and after training of the students of this tool. These groups included students from both technical courses as well as non-technical courses enrolled in Panjab University and a few of its affiliated colleges situated around Chandigarh in the Northern part of India. These responses of these sample groups have further been analyzed statistically to find out a) the effectiveness SESeLE tool, b) the impact of ICT usage in e-learning on students of non-technical courses and c) to compare traditional learning with the e-learning supported traditional learning of students of technical as well as non-technical courses.