

Chapter 18

Virtual Vidyalaya: An Integration of Pervasive Computing and E-Learning

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ABSTRACT

Pervasive computing is an evolving environment for the next generation providing with Information & Communication Technology everywhere, for everyone, at all times. e-learning is a phenomenon which is catching up the fire fiercely not only in corporate training world but also in the different sections of society. Pervasive computing is still in the evolving stage and opens a great naïve market yet unexplored. This chapter studies the features of Pervasive Computing which can take e-learning to the greater heights opening a new horizon for its growth and development. It also tries to analyze the factors that can contribute to the success of e-learning not only in making it reach the corporate training world but also in the rural areas of the world making a dream of education to all a reality in the environment of Pervasive Computing. It also studies and tries to find out the scope of e-learning in the light of Pervasive Computing.

INTRODUCTION

In the last couple of years, Pervasive Computing, sometimes also known as ubiquitous computing has been evolving as a new-brand computing phenomenon attracting a number of researchers to this area. Pervasive Computing is the result of computer technology advancing at exponential

speeds, a trend toward all man-made and some natural products having hardware and software. The key feature behind developing this new computing phenomenon is the evolution of concepts and its applications, finding out the adaptable means of interaction between the humans and the embedded machines. Pervasive Computing goes beyond the realm of personal computers. It is the idea that almost any device, from clothing to tools, to appliances to cars, to homes to the human body to coffee

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mug, can be embedded within chips to connect the device to an infinite network of other devices. It is about completely changing the definitions of the computers and the way it is seen and perceived in the current scenario. The basic objectives behind developing such systems are to make the computers penetrate deep in the lives of human beings making it Pervasive not only in name but in real sense as well. Similarly, just like air and water are Pervasive for human life, the objective is to make computing the same to human lives. It is also about the interactions between humans and machines and making them user-friendly to such a great extent that it gets merged in the daily lives of all the human beings. The goal of Pervasive Computing, which combines current network technologies with wireless computing, voice recognition, internet capability and artificial intelligence, is to create an environment where the connectivity of devices is embedded in such a way that the connectivity is unobtrusive and always available. The purpose of Pervasive Computing is to make computers easy to use just as our pen, paper or spoon and fork. e-learning describes the use of 'tools' such as computers, the Internet and in general, Information and Communication Technology (ICT), to provide learning or education in one or more subject areas. In the words of Pittinsky (2003, p. 206), "Among technologies missing are tools that support the varied subjects and teaching styles that comprise the full constellation of instruction that exists."

'Vidyalaya' is a word taken from the vocabulary of hindi language meaning "A School" or "An Institution" or "A Temple of Knowledge". Virtual specifies the presence without any physical existence. It gives an implication of its existence without being physically present as in the traditional approach as in the different parts of the world. In this paper, a study has been done to create a 'Virtual Vidyalaya' i.e. "A Virtual Temple of Knowledge" with the application of Pervasive Computing in the field of e-learning. This paper tries to find out, if Pervasive Computing Systems

can be applied in the process of learning and the ways in which it can benefit the learners from the different sections of the society to avail the benefits derived from this emerging wave of e-learning with an integration of Pervasive Computing.

BACKGROUND

Eight billion embedded microprocessors are produced each year. This number is expected to rise dramatically over the next decade, making electronic devices ever more Pervasive. These devices will range from a few millimeters in size as in small sensors to several meters as in displays and surfaces. They may be interconnected via wired and wireless technologies into broader and efficient networks. Pervasive Computing Systems (PCS) and services may lead to a greater degree of user knowledge of, or control over, the surrounding environment, whether at home, or in an office or car. They may also show a form of 'intelligence'. For instance, a 'smart' electrical appliance could detect its own impending failure and notify its owner as well as a maintenance company, to arrange for a repair.

'Hole in the Wall' as it is well known and named by Dr. Sugata Mitra (2006), Chief Scientist at NIIT is a revolutionary experiment going on which started with the slums in Kalkaji, New Delhi. On 26th January, 1999, his team carved a 'hole in the wall' that separated the NIIT premises from the adjoining slum in Kalkaji, New Delhi. A freely accessible computer was put for use through this hole. The installation of this computer drew the attention amongst the children of slum dwellers. Without any prior experience and education these children learnt to use the computer on their own. Based on this experiment the following hypothesis was drawn by Dr. Sugata Mitra:

The acquisition of basic computing skills by any set of children can be achieved through incidental learning provided the learners are given access to a suitable computing facility, with

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