Chapter 2

Literature Review

2.1 Introduction

In the chapter we discuss the literature review. The works on the e-Learning have been reported in the literature. Some of the tools are paid and some are free based. The free based tools are also known as open source e-Learning tools.

The e-Learning is defined in various ways by different researchers, teaching and learning community. The e-Learning refers to the use of information and communication technologies to enable the access to online learning/teaching resources. Dichanz, a professor of education and the German FernUniversität ends his critical analysis of the term, e-learning with the following definition: 

“E-learning is the collection of teaching – and information packages – in further education which is available at any time and any place and are delivered to learners electronically. They contain units of information, self-testing batteries and tests, which allow a quick self-evaluation for quick placement. E-learning offers more lower level learning goals. Higher order goals like understanding, reasoning and (moral) judging are more difficult to achieve. They require an individualised interactive discourse and can hardly be planned” (Dichantz 2001)

We may not completely agree with the Dichantz, we may realize that higher level learning objectives may not be incorporate in e-learning.

Unfortunately, the term e-learning is often used as a more generic term and as a synonym for online education. Kaplan-Leiserson has developed an online e-learning glossary. It provides the definition as: E-learning covers a wide set of applications and processes, such as Web-
based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM.

In the glossary of elearningeuropa.info, e-Learning is defined as: “The use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration”.

The term e-learning is, as one can see, not very precise, and it should be pointed out that learning is just one element of education. So, the term online education should cover a much broader range of services than the term e-learning. One may also claim that e-learning companies often focus on course content, while online education institutions cover the whole range of educational services of which student support most often is given major emphasis.

During the last 10 years a great many institutions worldwide have embarked on developing and offering online distance education. Institutions with a historical background from traditional on-campus education often seem to transfer teaching/learning philosophies, theories, concepts and metaphors from this environment. Keegan (2000) argues:

“... that web based education is best regarded as a subset of distance education and that the skills, literature and practical management decisions that have been developed in the form of educational provision known as 'distance education' will be applicable mutatis mutandis to web based education. It also follows that the literature of the field of educational research known as distance education, is of value for those embarking on training on the web.”

The above lines point that the skills, research literature, and management solutions developed in the area of distance education are of specific values during the design and developing online e-learning education systems with better quality. The great emphasis on student
support measures developed by leading distance education institutions should be acknowledged when developing the student support systems of future web based e-learning.

In its broadest sense, Abbad [13] defined e-Learning to mean any learning that is enabled electronically. They however narrowed this definition down to mean learning that is empowered by the use of digital technologies. This definition is further narrowed by some researchers as any learning that is internet-enabled or web-based [14].

According to Maltz [15] the term ‘e-Learning’ is applied in different perspectives, including distributed learning, online-distance learning, as well as hybrid learning.

In their literature review on definitions for e-Learning, Liu and Wang [16] found that the features of e-Learning process are chiefly centered on the internet; global sharing and learning resources; information broadcasts and knowledge flow by way of network courses, and lastly flexibility of learning as computer-generated environment for learning is created to overcome issues of distance and time [16] [17].

There are tremendous gains from practicing e-Learning through e-Learning tools, provided it is done carefully and systematically [18]. According to Algahtani [19], the likely benefits of e-Learning are greater than the benefits of traditional learning if e-Learning is used and applied in proper ways. By considering the various definitions and views on e-Learning, e-Learning may be defined as: The e-Learning can be defined as “Interactive and student centered online learning which includes the delivery of content via Internet, intranet/ extranet. It provides an automatic feedback to the student’s learning activities. The main intention of the e-Learning is to create a better adaptive and a novel learning environment for a learner” [4].
2.2 Review of Research and Development in e-Learning

2.2.1 At International Level

Most of the institutions and organizations are working to develop e-Learning standards. Core development specifications include metadata, learner profiling, content sequencing, web-based courseware, and computer managed instruction. Some of the organizations involved include:

- Learning Technology Standards Committee (LTSC)
- Learning Object Metadata (LOM) group
- ADL, an initiative of Department of Defense (DoD)
- Aviation Industry CBT (Computer-Based Training) Committee (AICC)
- Alliance of Remote Instructional Authoring and Distribution Networks for Europe (ARIADNE)
- PROMoting Multimedia access to Education and Training in EUropean Society (PROMETEUS)
- Learning Resource iNterchange (LRN)
- Getting Educational Systems Talking Across Leading-edge Technology (GESTALT).

2.2.2 At National Level

Some of the organizations involved at national level in India include:

NPTEL (National Programme for Technology Enabled Learning). Here e-Courses developed by IITs and IISc are being made available to many colleges through HTTP-based client-server interaction.
The ekalavya project from the Affordable Solutions Laboratory (ASL) of Department of CSE at IIT, Bombay,

According to some distinguished researchers that internet is a perfect tool of learning that offers flexibility and expediency to learners at the same time offering endless opportunities for innovate teaching [25] [26] [27] [28] [29]. Some researchers stated for some of the reasons for e-Learning success is that e-Learning systems would likely to encourage student learning resulting in a higher level of student engagement [30] [31] [32]. The e-Learning can be better than face-to-face learning, the quality of interaction and timely feedback is superior, with good course design can untangle the geographical limitations to education [33] [34] [35] [36].

The remarkable developments in Information Technology (IT) and networking have opened the doors of education. In the era of Information Technology (IT) e-Learning can be efficiently used for different types of education. Most of the population of India is in the rural areas where literacy rate is poor due to the lack of educational facilities [4].

Software and hardware companies involved in the creation of applications are always seeking advances to give them the edge over other software providers to gain profit and establish their brand name. Most of the countries are adapting to the globalisation and encourage higher education institutions to adopt (Information and Communication Technology)ICT for learning. Hence, most of the Government agenda in the respective nations remains the same to push forward with technology to enhance learning [37] [5] [38] [39].

Globalisation has affected academic staff and student learning with increased use of networked medium and telecommunications for the purposes of flexible learning. In other words education has been globalised by computing technology [40] [41] [42] [43] [44].

A study of computing technology in Kenyan Higher Education formed valuable insights into the reasons that influence e-Learning acceptance by students, the study provided new ideas
for higher education management for dissemination and infusion of computing technology for the purposes of learning. They concluded that the availability and access to computing technology, the quality and character of the institution leaders play an essential role to the success in e-Learning diffusion [45] [31].

A study carried out in Australia found Blackboard to be very popular amongst educational establishments. Blackboard “is limited to its environment” [46], it does not allow discussion, updates, notices and various other messaging within blogs and topics from different vendors, and it does not allow discussion forums to be directed to students’ personal email addresses which is a disadvantage to student engagement. This limits the academic staff and students to a particular environment even if they are not familiar with it or do not like it.

Very little research has been undertaken that discusses the perspective of the academic staff compared to students’ perspective. Even less research has been conducted on the effects of e-Learning on the academic staff [47]. Some researches show that administrators and academic managers are increasingly pressuring academic staff to incorporate technology into teaching for more active learning [27] [3] [48]. Such issues have to be taken in to care in design and development of e-Learning tools so that the content creation, delivery methods and evaluation methods should not be laborious for the teaching staff [49] [50] [51].

Some researchers have pointed some issues in the existing e-Learning tools that academics should always maintain a vigorous presence on online discussion boards so they control discussion, provide answers and feedback so students do not disengage from the course. [52] [53] [54] [55] [49].

If e-Learning tool is not designed with certain precautions, it needs lot of training. Providing adequate training would help academics do their job effectively whether this relates to
managing online discussion forums, or identifying pedagogical needs amongst students [7] [22] [56]. Training is vital how to academics utilise pedagogy in the e-Learning environment, how do they adapt learning style in their material, correctly using the e-Learning features are important, if academics do not know then investment will not yield the expected result [45] [11] [57] [58] [59] [60] [61].

Technical challenge refers to development issues such as the bugs, the speed, the errors, functions and features not correctly working or do not work according to what academics require [62]. In reviewing e-Learning literature there are various criticisms of the quality of the e-Learning systems currently being used. Issues have been raised that include: usability problems, bad performance, institutions being unable to customize according to their requirements and sometimes criticized for having a teacher centred system rather than learner centred system [21] [63]. The literature shows the work on the use of Fuzzy Logic for the delivery of the material [64] [65]. Fuzzy logic can also be used to evaluate the students performance [66] [55] [67] [68].

From above definitions the e-learning may be defined as:

“Interactive and student centred online learning which includes the delivery of content via Internet, intranet/extranet. It provides an automatic feedback to the student’s learning activities. The main intention of the e-Learning is to create a better adaptive and a novel learning environment for the learner”

2.3 Critical Observations

From the review of the literature the following observations limitations of the e-Learning tools have been made.

- Most of the existing tools are slow access to the course content.
- The tools are involved with the Non adaptive content delivery.

- Interactivity is difficult, and require additional technologies at both client and server sides.

- Technological barriers such as internet coverage and limited bandwidth.

- Security of the course content and content delivery, and

- Assessment of learners’ progress is static over different class of learners.

The Literature review indicates that there is less emphasis of e-Learning tools with adaptive content delivery, most of the tools are not student and teacher friendly. It is also observed that the evaluation techniques do not have provision for forward or backward navigation of evaluation levels. This will help to provide for reassessment of slow learners and also provide fast tracking for fast learners. The review also indicates that there is scope for research work on Fuzzy logic technique for evaluation method for all the aspects of Bloom’s Taxonomy.

2.4 Summary

From the literature survey it is observed that, the e-Learning has become a very integral part of educational and training sectors in institutions and industries and corporate sectors. The role of the e-Learning tools is very important to bring the e-Learning environment to the schools, colleges, universities, individual student, industries and corporate sector. Hence the research in the design of e-Learning tools has gained the greater potential in the recent years. The survey points out some of the major issues and the limitations in the existing e-Learning tools. The present e-Learning tools are not student, teacher or user friendly. Hence the design and development of novel e-Learning tools is a major challenge.