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EFFECTIVE e-LEARNING ENVIRONMENT A CLASSICAL INSIGHT

[1]MR. A. SENTHIL KARTHICK KUMAR , [2]DR. A.M.J MD. ZUBAIR RAHMAN

[1]Research Scholar, Research and Development Center, Bharathiar University, Coimbatore Tamilnadu, India. Pin Code-641 046
[2]Principal, Al-Ameen Engineering College, Erode, Tamilnadu, India. Pin code-638104
karthickmcamba@gmail.com, mdzubairrahman@gmail.com

ABSTRACT

The objective of this article provides an idea to every corporate, university and institutions on how to upload the knowledge towards the eLearning aspect for human resources. The discussion deals with three aspects: (1) eLearning is increasingly developed with lots of inputs, how these inputs are upgraded to be utilized in problem oriented areas of educational industry in a healthier way. (2) The concerns to provide a better platform to the learning community in which human behavioral analysis can be pursued on training and development schemes. (3) The ability to change continually and acquire new understanding towards the future developments. The main purpose of this article is for identifying or classifying the needs of better educational system to the current generation. In this research, researcher would like to provide a detailed report of learning methods and how technological endurance has provided better teaching aids in various dimensions.

Keywords *– Elearning; Cloud Oriented Learning; Courseware Creation And ICT*

1. INTRODUCTION

Innovations always lead to developments. Thus the so called computers also have paved a wonderful way towards global improvements and in the same way knowledge process flow obtained a great change in this scenario since 1974. The period of study concentrates the literature survey from 2000. In *October 2014, a* search was pursued through keyword indices on the Elsevier SCOPUS (Sciencedirect.com), which found 2500 Journals and 26000 books in the massive online database such as EBSCO (Professional Development Collection, Business Source Complete), Google Scholar and special concentration has been given to few list of journals which includes leading International journals in eLearning and knowledge engineering, proceedings like WCES, WCLTA, ICAPIE, ICEEPSY, DSAI, ICEL, ICTE, ICCS, ICII, UKMTLC, CY-ICER, ICEECS, WCETR, ITQM, ICVARE , ALSC, INTE, WCPCG, IJELLO SSBP, I-SEEC, fine-tuning has been made through topic filtering and it was found that 1417 articles were related to eLearning. By using another filtering process with the constraint of open access journals it comes to 333 articles, from which nearly 11 classifications has been sorted out by the researcher in the following topics it has been provided in *Figure: 1*. The researcher would like to organize the paper in such way to give clarity of the implementation of the above mentioned sources in the first part and the second part of the paper discusses on the future enhancements and implementation along with conclusion.

2. DRIFTS TOWARDS ELEARNING:

Globally it is an accepted fact that the internet usage has grown tremendously in the day-to-day activities of human life. The technology and life has become the two sides of a coin. Especially when it comes to knowledge sharing and recent trends in learning system, the students prefer to be on the net to acquire the knowledge [2, 3]. eLearning has experienced a lot of changes, and improved teaching conditions, while crossing the temporal and spatial constraints [79]. Today's tertiary students have been exposed to information and networking technologies from an early age. After the Internet evolution the learner's community has been clustered with three major categories: The first is embryonic period (1994-1999), conventional materials has been converted in to digital format. The Second is multimedia orchestration (2000-2003), where virtual environment with rich streaming media, digitalization of art works, course content preparations, and communication reached the learners.

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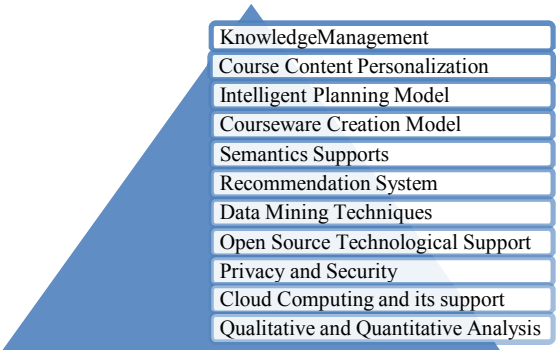

Figure 1: eLearning Key Factors Classification

The Third Category is socialization of knowledge transfer through social networking sites, project based learning, sport centric learning and etc. ICT reforms struck the learning process, firstly, teaching has been converted to learning and learning grows persistently, secondly class room space has gone as virtual space and finally facilitation and learning process has become more hyperactive. Students are performing their activity through online mode; this shows their dedication and enthusiasm towards online facilities. Virtual learning produces lot of benefits to the institutions, corporate and training & development centers. Besides few constraints, need to be measured in: learning rate, quality, ease of use, standards and instructional designs. All these together make a good eLearning atmosphere.

2.1 Different Perspective of Learning Classifications in contemporary circumstances:

The traditional learning system so far is factorizing the community. Traditional learning mainly focuses on: Expert Knowledge, Communication, Knowledge Sharing, Individual Student Concentration (ISC) and so on. On the other side, the heavy competitiveness required in the student's community on the basis of communication spreading, creates an awareness of social media and social networks e.g. face book, Twitter, Linked in. When we analysis the statistical report of these sites which the researcher mentioned above has grown in tremendous way due to the knowledge sharing [4]. eLearning systems are becoming technologically sophisticated and, complicated with regard to training management or course management. Their use doesn't match with traditional modes of teaching and learning and much care needs to be taken when considering the use of eLearning in educational institutions [68]. The time rolls on forward; in looking for a paradigm shift in all the sectors, in the providence of educational segment, the major growth rate has been occurred, and the terminologies are changing towards different perspectives. In this section researcher has classified the eLearning system especially with WWW consortium services.

2.1.1 eLearning and its Empowerment:

eLearning is a dynamic process rather than a static one, the progression of time has redefined towards technological developments. Open-source platforms for educational purposes appeared more than 15 years ago. But only recently it is seen as a viable alternative to proprietary software. Rather, these platforms are frequently being modified by new demands in both technical and pedagogical aspects [67]. Web based learning resource is an alternative to meet the expectations and needs of students in line with current modes of learning style [33]. eLearning moved towards automation and administration in the form of Learning Management System, this system has been supported by Technology Acceptance Model along with Self Directed Learning. Social Networking Sites has obtained this learning system in default that, sharing of resource and posting of various comments in the online forums, supports the credentials of collaborative learning etiquettes.

2.1.2 Collaborative eLearning and its Supports:

One of the most effective ways to improve learning is collaborative eLearning system; it's stanch from the unit of social interaction with mutual support. eLearning system offer new ways of collaborative learning that may enhance student performance [27, 20]. Collaborative learning aims to promote students individual cognition, group cognition and community cognition. The learner's characteristics are key pedagogical aspects for designing collaborative learning [39]. Collaborative constructivism emphasizes the importance of shared learning through interaction [24]. The COOPER (Cooperative Open Environment for Project Centered Learning) Project aims to support team based, project centered learning process, where learners belonging to distributed team are asked to work on projects and to cooperate to produce some results [71].

2.1.3 Blended eLearning in Real Time Environment:

Blended learning combines synchronous and asynchronous activities, technologies, audience (both local and global) and media types [18, 74].

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These environments combine instructor-facilitated activities with student-directed activities, which may overlap but nonetheless, achieve specific training goals and outcomes [75]. Country like India requires this kind of approach to enroute the necessity of education; it also removes constraints like time, geography and learners willingness. All together it is a variable surrounded to improve the proficiency of education as well as a challenging environment. But it requires only additional hardware and software support for making a product to run in a smoother way.

3. ELEARNING CLASSIFICATIONS:

3.1 Knowledge Management in eLearning:

Information is retrieved by sequencing the happenings i.e. data. This data is considered in to two types, empirical or discrete, where this data will act as a resource of information intern knowledge Domain (KD). Paul et al., brings out few important transformation details, through which learner's community is getting benefited. The rapidly growing use of information and communication technology (ICT) in academia is changing the way in which knowledge is created, organized, stored, managed and disseminated [50]. The convergence of eLearning and knowledge management fosters a constructive, open, dynamic, interconnected, distributed, adaptive, user friendly, socially concerned and accessible wealth of knowledge [44]. Generic process of knowledge management involves acquisition, creation, refinement, storage, transfer, sharing and utilization. Knowledge repositories created by eLearning grows often to support the employees at any particular moment. This is applicable in all types of institutions and corporate; this makes a promising approach to accomplish complex tasks and facilitating the future circumstances. In process of knowledge sharing the major issue which the organization faces is based on proprietary knowledge and so the corporate avoids open innovations. With the scope of technological support many institutions are integrating their applications in Open Educational Resources (OERs) for uploading the instruction materials. OERs provide quality of education based on informative materials, teaching guides, syllabi, text books, experimental demonstration, simulations and capacity building for all categories. The Ontology is a new method which gives us a modern approach for designing knowledge components of Knowledge Based System (KBS) [56]. The Computational Object Knowledge Based Ontology (COKB-ONT) [55] and its models have been established from Object-Oriented approach to represent knowledge together with programming techniques for symbolic computation.

3.2 Course Content Personalization for better eLearning Environments:

From an educational point of view, educational paradigm shift is required, where teachers play a vital role in the learning process. This can be achieved by content generation process with support of experienced designer and pedagogues; it will be portrayed based on learner's profile adaptation, again further refinement will be processed based on learner's potentials. This kind of planning process is required for improving their knowledge levels and bridging the gaps between learners and eLearning services. Several authors have used planning for generating learning routes based on student's preferences [15, 42, 14] , there are many model for content personalization in which IEEE LOM (Learning Object Metadata) model is standard for eLearning, which use label contents by using metadata. Web based systems also known as Course Management System (CMS) fulfill three goals: 1) Allow instructors to share learning resources such as lecture presentation slides; 2) Make it possible for lecturers to conduct online exams or evaluate students learning by grading their assignments; 3) Provide an interactive environment through the discussion forums to encourage collaborative learning. CMSs are generally categorized into two types: Open or Licensed Sources [45]. As part of the course content personalization the major issue lies with documentation and space management. Hence we have to device a simple and efficient mechanism to access, manage and share the information. It should provide fundamental document manipulation, synchronization, sharing functionality and support of heterogeneous system called Document Management System (DMS).

3.3 Intelligent Planning Models for Super Visioning:

Recent research however has begun to query the link between exposure to information and communication technologies and learning preferences. The frequent usage of technological accessing may lead to hesitation in participation, and learners become passive. To overcome this scenario Intelligent planning is very useful. Adapting the route to the new situation, making it valid again and minimizing changes to avoid further problems to students and teachers, maintains

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a kind of inertia. PPDL (Planning Domain Definition Language) helps to define their structural and dynamic properties [7]. Another model which deal with Class room Response System (CRS) which is incorporated with Technology Acceptance Model (TAM) through web-based CRS to create the system with computer playfulness, friendly interface and interactivity that enhance the teaching and learning experience and remain extensible and developer friendly. In this approach the researcher used three variables to build Personal Innovativeness in the domain of Information Technology (PIIT), 1. Subjective norm; 2. Self-efficacy; 3. Personal- innovativeness; to understand the effect of web-based CRS [17] . IEEE's Learning Technology Standards Committee stated that learning objects are "any entity, digital or non-digital, that can be used, re-used or referenced during technology-supported learning [29]. ARCS motivational model provides a systematic approach in the design of the instructions. According to the ARCS model the four components that need to be satisfied in order to construct a learning system, including eLearning applications, which can motivate learners are 1) Attention; 2) Relevance; 3) Confidence; 4) Satisfaction [30, 37]. An intelligent learning system based on a multi-agent approach consists of a set of intelligent agents, which have to communicate [69]. A multi-agent system proposed by [22], contains six software intelligent agents: the communication agent, the exam agent, the tutor agent, the pedagogic agent, the interface agent and the supervisor agent. The agents cooperate; they have distinct goals and are managed by the supervisor agent. The supervisor agent coordinates the whole educational process.

3.4 Courseware Creation Models towards Millennium Generations:

Courseware can be created on the basis of two categorical types that are: static and dynamic. Depends on the performance of learners it can be upgraded with zeal through the help of intelligent planning model, towards the discussion on courseware creation. Now-a-days they are performing on the basis of dynamic process flow. The construction of adaptive or personalized courseware is a "complex, time-consuming and expensive risk" [19]. Courseware Authoring Validation Information Architecture (CAVIAr), a formal modeling framework used to express courseware in terms of its design and requirements [46]. According to CAVIAr, courseware validation checks whether adaptive courseware conforms to a set of pedagogical and non pedagogical requirements. The Concept-based Courseware Analysis tool (CoCoA) developed at Carnegie Technology Education, uses two types of validation: typed items and advance concept roles [62].

3.5 Semantics Support to Ensure eLearning to be a Nascent Technology:

Semantics is the basic scenario in the World Wide Web consortium, which suggests the use of the data and Metadata information to satisfy the necessity of end-users and it is a continual process. The Semantic web is a mesh of information to be process able by machines, on a global scale. It is a new generation web that makes possible to express information in precise, machine interpretable form, ready for software agents to process, share and reuse it, as well as to understand the terms, Data [54]. According to [72], Ontology defines "a set of representational primitives with which to model a domain of knowledge or disclosure". Ontologies usage in educational systems may be approached from various points of view: as a common vocabulary for multi-agent system, as a chain between heterogeneous educational systems, for pedagogical resources sharing or for sharing data and to mediate the search of the learning materials on the internet [69]. Ontological representation of student domain skills can be automatically processed by intelligent software agents [6, 77]. In the context of web-based learning, we consider ontology as a tool for representation of subject domain knowledge, rather than for representation of course structure or instructional design [40]. Several attempts introducing universal ontology for eLearning materials have had only modest success. But there are lot of Ontologies and taxonomies, used to provide solutions of eLearning content managing problems in concrete areas or for concrete goals [69, 6, 57] .

3.6 Recommendation System Provides Learners Activity Identification:

This is another important area, for research community, especially on eLearning & SNS (Social Network Sites), where they are identifying the user profile and calculating the analysis based on their behavioral aspects and the concerned user will get updates. Updation get differs between users based on the recommendation analysis. For bringing a desired outcome from the analyzing part researchers apply data mining techniques. In eLearning this approach makes a major impact to the learner's capabilities. Brighter learners will be

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in different mode and average learners will get a contrast mode. The Personalized recommendations of resources help users to reduce time for browsing and searching, as well to recognize and to discover the resources that are of interest for them. One of the approaches produced by a research is based on an existing Contextualized Attention Metadata (CAM) frameworks that capture users current activities, and extend this framework to build a user profile that comprises his/her interests in terms of ontological concepts [34]. A Variety of techniques have been proposed for recommender systems: collaborative, content-based, knowledge-based, demographic techniques and the likes [66].

3.7 Data Mining Tools and Techniques: Accelerate and Accumulate Data:

Data mining techniques like Association rule mining [25, 1] were applied to extract the patterns and to evaluate the activities of online courses and classification. Also there are many researches that have been investigated in the online learning environment. For example, [76], investigated impact of learning style on eLearning by using statistics, and [53] , used Rule induction rough set to classify student knowledge [38]. Furthermore, [21] have combined clustering technique in the social networking to classify students. They used hierarchical agglomerative clustering method to create a cluster on a student by computing their matrix similarity [60]. K-Means algorithm is used for clustering large data population. There are several specialized web usage mining tools that are used in the eLearning Platforms. CourseVis is a visualization tool that tracks web log data from eLearning system [47]. By transforming this data, it generated graphical representations that keep instructors well informed about what precisely is happening in distance learning classes. GISMO is a tool similar to CourseVis, but provides different information to instructors, such as students details regarding the use of course material [48]. Sinergo/ColAT is a tool that acts as an interpreter of the student's activity in an eLearning system [8]. MATEP feeds them to a data web house which provides static and dynamic reports [82]. Analog is another system which consists of two main components. The first performs online and the second offline data processing according to web server activity [78]. Past user activity is recorded in server log files which are processed to form clusters of user sessions [70].

3.8 Open Source Technology and its Contribution to enhance eLearning System:

Free Open Source System (FOSS) is software which is liberally licensed to grant the right of users to study, change, and improve its design through the availability of its source code. The FOSS means that you can obtain the software free also you can change and distribute the software. The usage of FOSS is mostly beneficial to the developing countries because it provide affordable know-how knowledge and easy technology adaptation [81]. The FOSS is also easy to develop any kind of software including eLearning system and tools according to Bazaar Model [65]. FOSS is very potential in using open source system and also has contributed much to the education system [23]. Based on the research mentioned, profit is not the main factor in developing open source software. Only 13% of open source users use it to gain profit. Most designers and software users agree that 70% to 78% use open source based on social principle which is knowledge sharing and learning and developing new skills [63, 59].

3.9 Privacy and Security Measures in eLearning System:

In eLearning environment privacy and security measure are considered to be an important factor. The factor on this analysis says anytime, anywhere concept in the globally connected materials or sharing of thoughts can be viewed or commented by the anomalies, it creates an impact on the social security measures. eLearning has developed significantly within a short period of time. Thus it is of a great significance to secure information, allow a confident access and prevent unauthorized accesses. Making use of individual's physiologic or behavioral (biometric) properties is a confident method to make the information secure [26]. Most of the eLearning systems provide services such as forums, emails, online assessments, learning resources and notices which allow the users to communicate irrespective of time and space. Since it is a web based system, it is exposed to computer security threats [80]. So researchers came to a decision for making known-to-known concept, inviting criteria setting, known-to-second known concept. Like this social networking is pursuing, how this to be incorporated in eLearning system through trust relationship. Identity Management is the key factors for avoiding privacy issues. Trust relationship among co-learners is important for collaboration activities in eLearning environments. A Trust relationship may need to be developed

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between two unknown learners who find them working together. Reputation appears to be one effective source for measuring trust. Reputation is a contextual and longitudinal social evaluation on person's actions. Identity Management has been shown to offer an effective solution to privacy [51, 64], particularly in learning domains [52, 36].

3.10 Cloud Computing and its Contributions for eLearning:

Virtual Environment has given an immense space to develop the process flow system in continual manner, in this context technological improvements has gained a great enhancement capabilities, towards the innovations and technical support which is given by the distributed system and now we are into the era of cloud computing facilities. Distributed system has provided lots of support to business oriented, service oriented, environments [73]. The aim of VE is reducing commuting and to save time and cost of learning easy for trainers and learners/students [49]. Cloud computing leads a new tide of information technology toward a whole new world of living style. Technology education is a subject area of common education and provides learner the opportunity of accepting technology [43]. Cloud Computing Reference Architectures (CCRA) is a technology-neutral abstraction that defines the role and relationships between actors in the CC Context [9, 13, 41]; IBM CCRA [10], was reported to have provided more service management details. On the use of the cloud for education related activities, Masud et al [78], introduced CC to increase the scalability, flexibility and availability of eLearning systems. There are few public clouds which support innovative eLearning systems such as Amazon Elastic Compute Cloud (EC2) or Windows Azure; Google App Engine.

3.11 Qualitative and Quantitative Analysis on Educational Technologies:

The Comparison of eLearning competency is a continual, systematic development process and quality examining on eLearning operation of an organization. It aims to find an operational method and an operational guideline from organizations recognized by others [32]. eLearning Quality Assurance Program (eLQA) quality framework was developed to promote and encourage the eLearning industries to pursuit high quality eLearning, but it won't do systematic process, especially from the participant's perspective [31]. Every tool has to undergo the qualitative and quantitative analysis. This is to make sure how much the concerned tools are satisfying the developers and end-users need. In this part the types of analysis which has been pursued will be discussed. TSST (Technical Survival Skill Test) was used to determine the student's computer skill level in the form of numerical scores. This test is based on Cronbach's Alpha Score Analysis [11, 61]. iSELF: an Internet-tool for Self Evaluation and Learner Feedback. The tool is designed to stimulate self directed learning in a ubiquitous learning environment and our experiences so far confirm its usefulness [58]. In order to focus on individual users Perception on Innovation Characteristics (PCI) of eLearning two special questions were asked. First, can the perception variables of innovation characteristics (PCI) predict individual's intention to use an eLearning web site? The second, whether the technology adoption model of learners experienced in eLearning is different from inexperienced learners [12, 28]. These are the tests which are frequently used for doing numerical analysis, Eigen values analysis test with Cattell's Scree test [35, 16], Regression Analysis, Correlation analysis, F-Test and Z-Test, Likert scale test along with Mean, Mode and Standard Deviation. Delphi was designed as a structured communication technique by RAND in the 1950s to collect data through collective opinion polling [5]. The usage of web application can be measured with the use of indexes and metrics. However in eLearning platforms there are no appropriate indexes and metrics that would facilitate their qualitative and quantitative measurement. In such time, data mining techniques such as clustering, classification and association, in order to analyze the log file of an eLearning platform and deduce useful conclusions [53].

4. LIMITATIONS:

This study has certain limitation, based on the open access facility which has been provided by the online databases, from where the article has been collected. Primary focus has been given to prepare a prevalent literature review based on eLearning, is quite challenging, because it has now taken many forms with similar taxonomy. Researcher has used keyword indices as a main benchmark for collecting, studying and classifying these articles. Even though acknowledging restricted conditions and acquaintance, this paper makes a brief review of literature concerned with eLearning from 2000 to 2014 in order to find out how eLearning and its enhancement regarding architectural exploration with tools and techniques have been developed. In fact, the classification of this wide area has been

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done based on the keyword index and full text of articles, collected for this research. Some other articles may be related to this approach, but may not have an eLearning classification index. So this paper is unacquainted of these reference sources, though, articles retrieved from Elsevier SCOPUS (Sciencedirect.com) massive online database. These would have provided more complete information about the developments in eLearning. Lastly, non-English publications were excluded from this study.

5. CONCLUSIONS:

All the studies under various classifications support and enhance the eLearning system. Considering that, apart from the open sources available, there are several tools available only on cost basis, which are not affordable for many of the prospective eLearners. The open source software could be utilized only on a general construct, where as the demographic stages and learners perspective could not be considered. This can be implemented only if the content creation is done by the teachers on a *Tailor Made Construct* with limitations on the subject and group of the students. Over and above the discussed advantages of the study, the researcher would like to incorporate the following few aspects in the learner's perspective like, the ability to Remember, Understand, Apply, Analyze, Evaluate and Create. This model will give more emphasize on the real knowledge sharing for the eLearners. For this researcher would like to construct a new model with three major variables like ICT, knowledge provider and knowledge receiver using the maximum credibility of Cloud Computing. The knowledge provider will create the knowledge base considering all the above points and using the ICT facilities to its maximum potentials, which will reach the learner with the core objectives in the learner's perspective. When the content is developed in the learner's perspective it will be considered as an effective tool (*Trident Constraints including Geography, Infrastructure and Management*) and limitations may be implied on the demography. The tool will consider the major advantages of Infrastructure as a Service (IaaS) and Software as a Service (SaaS), to create the model. The eLearning system cannot be avoided but can be utilized progressively by the instructors for better knowledge sharing once constructed in this model. The more vulnerable student community, if attracted towards the traditional learning system incorporated with this model of eLearning, any country will have a healthier environment, economic growth and peaceful society. The infrastructures in the existing institutions need to be enhanced with the available recent technologies to have a combination of Traditional-Learning and eLearning educational environment. The researcher is in the process of developing an application by considering all the above observed necessary factors which are best suited, especially for educational institutions betterment. The application will be based on knowledge, skills and evaluation.

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