E-COMPUTER CONTENT DEVELOPMENT: A MILESTONE IN THE DYNAMIC PROGRESS OF E-LEARNING

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ABSTRACT

Educational systems around the world are under increasing pressure to use the new information and communication technologies (ICTs) to teach students the knowledge and skills, they need in the 21st century. To develop a knowledge society, integrating ICT at all levels of education is essential. However, even today one of the greatest challenges of integrating ICT in education is lack of quality e-Content. So it is the need of the hour, to encourage e-Content production at various levels of education. For the upcoming generation i.e. Digital Natives (Prensky Marc, 2001), we need to create a digital learning culture and environment. e-Learning serves this purpose in its various forms such as web-based learning, computer-based learning, mobile-based learning, virtual classrooms, and digital collaboration. The ultimate aim of e-Content development is to create an information rich society where everyone, irrespective of caste, religion, race, region, gender etc., are empowered to create, receive, share and utilize information and knowledge for their economic, social, cultural and political upliftment and development. In the process of e-learning, structured and validated e-content can serve as an effective virtual teacher. This article describes the e-Content production and its necessity to enrich the e-Learning.

Keywords: e-learning, Information and communication technology, Knowledge society

INTRODUCTION

In this knowledge explosion trend, production of creative contents and incorporating innovative Information and Communication Technologies (ICT) for effective dissemination of such contents play a vital role. To develop a knowledge society, integrating ICT at all levels of education is essential. However, even today one of the greatest challenges of integrating ICT in education is lack of quality e-Content. For the upcoming generation i.e. Digital Natives (Prensky Marc, 2001), we need to create a digital learning culture and environment. Mastering ICT skills and utilizing ICT towards creating an improved teaching and learning
environment is of utmost importance to teachers in creating new learning culture (Molly Lee, 2005). e-learning serves this purpose in its various forms such as web-based learning, computer-based learning, mobile-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via internet, intranet/extranet, satellite broadcast, mobile technology. This great transformation poses challenges to educators regarding their basic tenets, to deploy the media in creative and productive ways, as “teachers are the central forces in tapping the learning opportunities created by ICT” (Majumdar, 2004).

In the process of developing a techno-pedagogy for the ‘new’ learner in the ‘new’ environment, learning ‘new’ things using ‘new’ technologies, the first issue to be addressed is the development of content. The ultimate aim of e-Content development is to create an information rich society where everyone, irrespective of caste, religion, race, region, gender etc., are empowered to create, receive, share and utilize information and knowledge for their economic, social, cultural and political upliftment and development. In the process of e-learning, structured and validated e-content can serve as an effective virtual teacher.

E-CONTENT

Normally in the growth of technology applications in education, we are moving towards a Virtual Reality where the distance between the teacher and the taught is nil. The possibility of such virtual reality can be made by generating good e-Contents and accessible by all. E-contents are basically a package that satisfies the conditions like i.e. minimization of the distance, cost effectiveness, user-friendliness and adaptability to local conditions (Saxena Anurag, 2011)

E-content is digital information delivered over network-based electronic devices, i.e., symbols that can be utilized and interpreted by human actors during communication processes, which allow them to share visions and influence each other’s knowledge, attitudes or behavior (Buchholz Andrea & Zerfass Ansgar. 2005). Towards a broader definition “the design (pedagogical and learning principles used to create the digital intervention) of the subject matter (E.g. Math, Science etc.) in question and the digital delivery mode (Computer, Video etc.) used (NUEPA, 2007).
It may also be defined as “digital text and images designed for display on web pages.” (http://oxforddictionaries.com/definition/e-content). E-content means content in the electronic form. It is a combination of text, audio, video, images, animation with visual effects. Any digitized content that can facilitate the learning process and/or learning outcome can be termed as e-content. e-Content (defined as learning material with relation to new media) the acquisition of these contents takes place via four different channels: purchase of materials, use of freely available content on the Internet, self production of material, exchange of existing material in a network with other institutions of Higher Education (universities, universities of applied sciences etc.; AG eLearning, 2005).

**NATURE OF E-CONTENT**

E-Contents should essentially be didactic in nature. The term "didactic" refers to contents such as self-instructional material, audio and video that convey some moral, fact or learning. In virtual education, the self-instructional materials are essentially didactic in nature. The philosophy behind this is that self-instructional materials try to bridge the gap between the teacher and the taught. The philosophy stands good for the e-content generation too. According to Selinger (2004), “e-content should be seen as a tool to improve the understanding, engagement and motivation of learners; to provide a safe environment for them to experiment and explore their conjectures; and to test their understanding using novel assessment methodologies based on trial and improvement; simulations and manipulation of models”. The didactic nature of e-contents seems to fulfill this condition as the learner while reading the didactic content builds an understanding and then assess that understanding using quiz/buzzles. e-Content can also be utilized as reusable learning objects. Wiley gave a working definition of learning object as “any digital resource that can be reused to support learning.”

**DESIGN AND DEVELOPMENTAL PROCESS OF E-CONTENT**

Unfortunately, existing materials and documents cannot be automatically transformed into e-content materials by just making them available from a Web site. A systematic and scientific approach is needed to develop quality content. Instructional Design is the teaching device that makes instruction as well as instructional material more engaging, effective and efficient. It is the branch of knowledge concerned with research and theory about instructional strategies and the process for developing and implementing those strategies. Instructional Design is the process of systematic development of instructional
specifications using learning and instructional theory to ensure the quality of instruction. There are three learning theories (Cognitism, Constructivism and Behaviourism) support the Instructional Design as backbone. Cognitism envisages the organization of the content, storing and retrieving of the content. Constructivism supports the learner centered holistic approach in e-learning. Behaviorism stresses the reinforcement, retention and transfer of knowledge in the e-Content development.

There are several approaches to explain the design and development processes of content development. Association for Educational and Communication Technology [AECT] which is a professional organization in the educational technology field in the United States, has proclaimed the five stages of instructional design that can be used to develop any learning situations and learning content, that is the ADDIE model to include Analysis, Design, Development, Implementation, and Evaluation (Seels & Richey, 1994). The ADDIE model is a basic model for designing and developing learning courses as well as educational content. Figure 1 shows the interactive relationships among the stages.

[Source: Seels & Richey, 1994. Instructional technology: The definition and domains of the field.]

Dick, Carey, & Carey (2005) also suggest a systematic model for designing instruction and learning content, the so-called Dick and Carey systems approach model for designing instruction. Figure 2 indicates the stages of the model. The Dick and Carey systems approach model is a good guideline for designing instructional units at any educational levels.
Every model has common phases in the design and development of instruction, namely planning, design, development and evaluation. Table 3 gives a brief description of each phase, essential activities, and management issues (Alessi & Trollip, 2001; Greer, 1992; Smaldino, Lowther, & Russell, 2007).

Table 3: Brief Description of Each Phase
[Source: Heeok Heo, 2010. Content Development for ICT use in Education]

<table>
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<tr>
<th>Phase</th>
<th>Description</th>
<th>Activities</th>
<th>Management Issues</th>
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<td>Planning</td>
<td>To determine the overall plan to develop educational content, and to identify basic information needed for development</td>
<td>Define the scope, Identify learner characteristics, Identify Learning environment, Estimate time, budget and resources, Produce a planning document</td>
<td>Establish educational Standards, Prepare general guidelines to plan budget, Sign-off the products</td>
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Generally e-Content development classified as follows: i) Assembled e-Content ii) Short Courseware/Unit/Module iii) Full Courseware iv) Short learning Objects. Those can be represented in the form of e-Learning modules and Short learning objects. e-Learning Module is a comprehensive package containing a lesson. According to the guidelines of University Grants Commission(UGC- India, 2007), the academic content for each of the module should comprises of a) Home b) Objectives c) Subject Mapping d) Summary e) Text, Case studies, FAQ’s f) Video and audio g) Assignments/Quiz/Tutorial h) References/Glossary/Links i) Download j) Blog k) Contact. Short Learning Object is a new way of thinking about learning content. They are much smaller units of learning, typically ranging from two to three minutes. It may be a description about an item, a concept, equipment, a property, characteristic feature, process, form, definition, activity, reaction, plan, cause and effect relations, causative factors of events, results of events, applications of phenomena or processes, explanation of components in a subject of learning etc.
E-LEARNING THROUGH E-CONTENT

One of the most innovative and promising outcomes of distance learning and telecommunication relationship is e-learning. It is a process whereby teachers and students are linked up in an electronic media/computer network (Majumdar, S. and Park, M. 2002). E-learning facilitates the learner in terms of any time learning, anywhere learning, asynchronous interaction and group collaboration. E-learning provides the possibility of teaching based on learning objects (Wiley, 2001). Learning objects are the smallest independent educational components which can be reused in e-content of different subjects and authors; thus it is more economical and time-saving in e-content development. The teaching method in e-learning has changed from being teacher-based to being student-based. Virtual environment can create pervasive and dynamic interaction through virtual simulation which will upgrade learning accompanied by hearing and seeing to practical learning and experiencing (Ataei & Najibi, 2010).

CONCLUSION

Content is the heart of learning and medium acts as nerves in that. Although content development plays a key role in e-learning, it is undoubtedly not an easy process (Jegan, 2004). It requires expert knowledge in the subject area, patience in creating the necessary objects that make up quality, interactive courseware, and a high sense of creativity in structuring and sequencing the topics to make a complete whole (Omwenga et al, 2004). From this we can predict that e-Content production enrich the e-learning in a dynamic way. It is said that people are visual minded. They retain 20% of what they hear. 50% of what they hear and see. And probably, 100% of what they hear and see and do. This is what e-contents are poised to do and what e-contents are intended for.

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