Smart People-Smart Content -A New Trend of Education

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ABSTRACT

In Today's world of technology, People being smart using smart technology and smart content i.e. e-content. Visa versa a smart content (E-Content) developed using smart technology makes people smart. Here comes the role of ICT (Information and communication technologies) have become conventional entity in all parts of life. Across the past years the use of ICT has primarily changed the platforms in higher education also content based learning produces smart students which are the handy tool to develop future of the country. Education is a social activity and quality education has usually been related with strong teachers having huge amount of personal interaction with learners. The use of ICT in education gives itself to more to student. In the growing technological world of digital media and information, the role of ICT in education is becoming more and more important. This paper highlights the various tools and techniques available to make content to smart content (e-content) and how ICT can change the way of teaching in better ways to makes learner and teachers smart.

1. Introduction:

Today the entire world is moving speedily towards digitization and we have to learn new things using new technologies. The evolution of computers especially the internet has affected in all phases of our life. Ten to fifteen years back we used to spend our time in the library for information in books, magazines and journals. Now a day we search for the information in the web sites. Access to information has become very easy because of information sharing on World Wide Web (www). Quality of teaching and students' learning are determined by the teachers who teach them. Well trained teachers with required knowledge, skills and commitment can develop scientific and critical thinking, promote tolerance, and develop cultural and social values in them. Advanced technologies will make it possible to achieve these by providing new ways to teachers. But these new technologies are placing more demands on teachers to learn how to use them in their teaching and learning processes. This great transformation is posing challenges to teachers and teacher educators in using technologies in creative and productive ways. Hence, as a teacher you should have to meet these new challenges by continuously acquiring new knowledge and skills to discharge our duties effectively. ICT gives great opportunities for capturing, storing, distributing and communicating a wide variety of information. Because of rapid expansion of knowledge and availability of variety of ICT has made knowledge, inclusion and integration of ICT in teaching and learning inexorable for us now. Moreover, ICT can promote international collaboration and networking in education and provide more flexible and effective ways for professional development. It can also help in pre-service and in-service teacher training programs.

2. E-Content a Smart Content

Wide varieties of digital materials which are of educational significance are available online. Some of the quality materials which are available free of cost or with minimum restrictions can be used, re-used and modified by teachers and students for their teaching and learning. As textbooks are too expansive, the students are switching from textbooks to digital course materials. These materials provide both teachers and students a greater interactivity and social collaboration. One of the materials which can be designed and developed used, re-used and distributed is e-content. E-content is becoming popular because of it's flexibility of time, place and pace of learning. E-content includes all kinds of content created and delivered through various electronic media. E-content is available in many subjects and almost all levels of education. It can be used by wide variety learners with diverse needs, different backgrounds, and previous experience and skill levels. It can be shared and transmitted easily and promptly among unlimited number of users around the world. Teachers, students and others get benefited by the use of well designed and developed e-content. It is advantageous to the educational organizations to make their program accessible to their teachers and students on campus, home and other community learning or resource centers. It has a significant implications for open and distance learning institutions.

Electronic content (e-content) which is also known as digital content refers to the content or information delivered over network based electronic devices or that is made available using computer network such as internet. According to Oxford dictionary 'e-content is the digital text and images designed to display on web pages'. According to Saxena Anurag(2011) 'E-content is basically a package that satisfies the   conditions like minimization of distance, cost effectiveness, user friendliness and adaptability to local conditions'.

3.   Designing & Development of E-Content

The purpose of e-content development is to create an information rich society. Every one in the society is empowered to create, receive, share and utilize information for their progress. Very well designed, developed and validated e-content will provide access to high quality meaningful digital content and serve as an effective virtual teacher.

E-content design, development and approach will depend upon the nature of the content and the learners. It will also depend on the quality and complexity the learning you wish to create. Various instructional design models are available according to our requirements. Most of the models involve the process of analyzing the learner needs and goals of the instructional material development, development of a delivery system and content, pilot study of the material developed, implementation, evaluating, refining the materials etc. In designing and development of E-content we have to adopt one of the instructional design models based on our requirements. Before understanding the designing and development of e-content it is essential to understand the meaning of instructional design. According to Wikipedia 'instructional design is the practice of creating instructional experiences which make the acquisition of knowledge and skill more efficient, effective and appealing. The process broadly consists of determining the current status of learner understanding, defining the end goal of the instructional material and creating some 'intervention' to assist the transition. This systematic approach provides a step by step process for the analysis of the learners' needs, the design and development of the material'. Most common and popular model used for creating instructional materials is the ADDIE model. This abbreviation stands for the five phases involved in the model. They are analyze, design, develop, implement and evaluate. This model is initially developed by Florida State University to explain the processes involved in the

formulation of an instructional systems development (ISD) program for military inter-service training. ISD was meant for training individuals to do a particular job. This can also be applied to any inter-service curriculum development activity. Originally the model contained several steps under its five original phases (analyze, design, develop, implement and evaluate). Over the years the steps were revised and finally the model itself became more dynamic and interactive.

4. Learning Objects and Re-usability of E-content

The term learning object was coined in 1994 by Wayne Hodgins. It gained quick popularity among educators and instructional designers because these digital materials are designed to allow easy reuse in a wide range of teaching and learning situations. Before understanding the meaning of learning object it is essential to know the meaning of asset. In Wikipedia '**Asset** is defined as the smallest, indivisible digital unit for information transfer, e.g. a picture or a short text, a plain picture/text combination or a small and simple animation.

4.1 Learning Objects

Learning Objects are defined in different ways by different organizations and individuals. Let us consider some of the definitions of Learning Objects here.

According to Wikipedia 'a learning object is a resource, usually digital and web-based, that can be used and re-used for learning'.

According to the Institute of Electrical and Electronics Engineers (IEEE) a learning object is *"any entity, digital or non-digital, that may be used for learning, education or training"*.Chiappe defined Learning Objects as: *"A digital self-contained and reusable entity, with a clear educational purpose, with at least three internal and editable components: content, learning activities and elements of context. The learning objects must have an external structure of information to facilitate their identification, storage and retrieval: the metadata."*Daniel Rehak and Robin Mason define it as *"a digitized entity which can be used, reused or referenced during technology supported learning"*.

Learning objects are any items which have the potential to promote learning. An object which can promote learning and teaching is considered as a learning object. For example a printed book, a news paper report etc. Digital learning objects are any thing in the digital form such as learning design or whole course or other forms of resources from a set of learning out comes. These are cataloged and stored in leaning objects repositories. A learning object consists of several learning assets that are structured in a pedagogically meaningful way.

Following are some important characteristics of learning objects:

- Learning objects are a new way of thinking about learning content.

- Learning objects are much smaller units of learning, typically ranging from 2 minutes to 15 minutes.
- They are of discrete nature. Because of their discrete nature they can be categorized and stored independently
- They are self-contained – each learning object can be taken independently
- They are reusable in the sense a single learning object may be used in multiple contexts for multiple purposes
- They can be aggregated means learning objects can be grouped into larger collections of content.
- Every learning object has descriptive information. It becomes easy for identification, search and re-use.

4.2 Re-usability of e-content

Three aspects are important in the re-usability of e-content. They are technical, non-technical and pedagogy related ones. Technical re-usability is concerned with various kinds of tools used to support

e-content. Non re-usability of e-content is related to the standardization initiatives, intellectual property protection, knowledge transfer, organizational, managerial, social aspects etc. Pedagogy related re-usability includes content, scenarios and pedagogic approaches. E-content can be modified and re-used easily. Technical re-usability of e-content is concerned with the various kinds of tools used to support e-content. These tools may include documentation such as guidelines and instructions saved in the repository. You know that modifying book information is not as flexible as in the case of digital form material.

5. Standards of E-content

E-content standards are rules that most e-content developers should abide by. Standards are *engineering or technical specifications* that help e-content developers to establish uniformity. The different kinds of standards are mandatory, voluntary and defacto. Mandatory means one should comply, voluntary is one may or may not follow and defacto which are well established common practices but may not be formally published. Ensuring the high quality of the e-content is concerned with creating, communicating, and maintaining consistent development standards. Writing and textual, graphical and page design, questions and test, interactivity and audio/video standards and guidelines are to be ensured before finalizing. With respect to the quality of the e-content it should be correct, adaptive, communicative, interactive, reflexive, explorative, standardized etc.

Formal standards bodies such as the World Wide Web Consortium (W3C), the Internet Engineering Task Force (IETF), and International Organization for Standardization (ISO) etc publish the electronic standards. W3C is international standards organization for World Wide Web.

E-learning industry follows certain standards for integration of course ware. There are several standards available today for content integration and interoperability. International bodies generally design and publish the standards.

According to International Organization for Standardization(ISO) standards can be defined as "documented agreements containing technical specialization or other precise criteria to be used consistently as rules, guidelines or definitions of characteristics to ensure that materials, products, processes and services are fit for their purpose."

Share-able Content Object Reference Model (SCORM): It is a powerful tool. Content can be created and used in many different systems. Content can also be used in many situations without modification. It is the most widely used standard in all LMSs. It has applications in general usage as well as defense related uses.

Aviation Industry CBT Committee (AICC): This was the first standard to be adopted by the e-learning industry. It is still actively used in the aviation industry.

Institute of Electrical and Electronics Engineers (IEEE) IMS Standards: This enables high quality accessible and affordable learning experiences. This standard is mainly used today schools, colleges, universities, government institutions etc.

Instructional Management System Global Learning Consortium (usually referred to as IMS GLC, IMS Global or simply IMS) is a global, nonprofit, member organization that strives in shaping and growing the learning industry through community development of interoperability and adoption practice standards. Their main activity is to develop interoperability standards and adoption practice standards for distributed learning,

6. E-content Tools

E-content can be created in a variety of ways by using variety of tools and software. E-content development combines Content Management System (CMS) and Learning Management System (LMS). There are several proprietary software, freeware, open source software, public domain software and so on are available for e-content development. Among available tools and software packages Microsoft Office Software Package can be used easily by the beginning e-content developers.

Freeware: It can be used without any monetary charges. However, restrictions are imposed for its use, modification and redistribution. In this source code is not provided. This tool can be passed on to any one free of cost.

Open Source Software (OSS): It is computer software and its source code is made available to the pubic. It is licensed with an open source license. Copy right holder provides the rights to study modify and distribute the software free of cost to anyone for any purpose. Open Source Software is very often developed in a public collaborative manner.

Proprietary software is software that is owned by an individual or a company. It will have major restrictions on its use and its source code usually kept secret. These are exclusive property of their developers and can't be copied or distributed without complying with their licensing agreements.

Public domain software: The copy right holder donates it to the public. It is available free of cost to every one and it can be used by any one for any purpose and only with very minimal restrictions.

6.1 Graphics, Audio and Video-Creating and Editing Tools

There are several audio, video and graphic creators and editors software available online. Some are free and some are paid.

Wevideo is a video creator and editor which allows us to edit and make video in an easy and intuitive way on this cloud-based app. It allows you to control the video sections easily in areas like the transition, fast and slow motion, adding effects etc.

Magisto is a video editor that can help you make your video in just a few steps. Upload the video, than you can choose one of the premade editing styles, add a sound track, add a title and the video will be ready for download or for sharing on the social media.

DrawPad is a Graphics editor and an easy-to-use image composition and manipulation program for all types of graphic design projects. You can make sketches and paintings on your computer, create logos, banner ads or billboards, draw diagrams, icons and other web graphics

WavePad: This is a **audio editing software.** This is a full-featured professional audio and music editor for Windows and Mac. It lets you record and edit music, voice and other audio recordings. When **editing audio** files, you can cut, copy and paste parts of recordings, and then **add effects** like echo, amplification and noise reduction. WavePad works as a **wav or mp3 editor.**

VideoPad is a powerful and easy-to-use video editor that lets you import videos, add music and effects, then burn to DVD. You can **edit video** from any camcorder Capture video from a DV camcorder, webcam, or import most the video file format. More than 50 visual and transition effects are available to add a professional touch to your video. You Create videos for DVD, HD, YouTube etc. You can burn movies to DVD for playback on TV, or as a standalone video file to share online or put on portable devices.

6.2 Authoring Tools

Various tools are available to produce e-content. Microsoft Power Point and word processors are also e-learning tools. These tools are not appropriate to present interactivity, testing and scoring. To develop interactive content various elements such as examples, illustrations, animations, audio, video, interactivity etc are assembled. For this purpose we can use special tools which are authoring tools or author-ware. An e-learning authoring tool is software packages which can be used create and modify web content for the use by other people. Examples are blogging, wiki online forums etc. This tool can be used by e-content developers for creating, packaging and delivering the e-content to the learners. By using authoring tools one can produce attractive and useful graphics. Authoring tool or author-ware is a programme that helps to write hypertext or use multimedia applications. Authoring tools allow authors or e-content developers to integrate or use any array of media to create professional, engaging and interactive e-content. In Wikipedia 'An authoring tool is defined as a software application used to create multimedia content typically for delivery on the world wide web(www)'. Content authoring tools may also create content in other file formats so that material can be provided through compact disc (CD) or in other format for various different uses. Authoring tools can be used by people with minimum technical skills.

The main advantage of authoring tools is their easier and faster use. Using these tools e-content can be developed and transferred easily. There are many categories of authoring tools which differ with respect to their features. Very simple Microsoft PowerPoint converters to powerful tool boxes are available for e-content development and delivery. These authoring tools have some common features. They are

- Scope for interactivity
- Navigation-ability to move throughout the content based on the content menu.
- Editing -e-content developers can make changes or update the material easily.
- Preview or play back -it is possible to preview or play back the material.
- Cross platform and cross browser inter offer-ability - it is possible to run on all platforms and different browsers.

There many authoring tools, some of them are license software,free software, open source software etc.

eXe Learning is a free software tool that can be used to create educational interactive web contents.eXe learning can generate interactive content and it allows one to create easily navigable web pages including text, images, interactive activities, image galleries or multimedia clips. All the educational material generated with eXe Learning can be transferred to different digital formats. That can be used independently or to integrate them into a Learning Management System(LMS) like Moodle.

The **Xerte** is a free and open source authoring tool which provides a full suite of open source tools for e-Learning developers and content authors producing interactive learning materials.

Adobe Captivate is proprietary software. It is a rapid responsive authoring tool that is used for creating e-learning contents such as software demonstrations, software simulations, branched scenarios, and randomized quizzes in Small Web Formats (.swf) and HTML5 formats. It can also convert Adobe Captivate generated files formats (.swf) to digital MP4 (.mp4) formats which can be played with media players or uploaded to video hosting websites. For software simulations, Captivate can use left or right mouse clicks, key presses and rollover images. It can also be used to create screen casts, and to convert Microsoft PowerPoint presentations to Small Web Formats and HTML5 formats.

Authorware is the leading visual authoring tool for creating rich-media e-learning applications for delivery on corporate networks, CD/DVD, and the Web. We can develop accessible applications that comply with learning management system (LMS) standards.

Adobe Author-ware (previously known as Macromedia Authorware) was an interpreted, flowchart-based, graphical programming language. Authorware is used for creating interactive programs that can integrate a range of multimedia content, particularly electronic educational technology (also called e-learning) applications.

7. Benefits of e-Content

Increasingly, organizations are adopting e-Content as the main delivery method to train employees. At the same time, educational institutions are moving toward the use of the internet for delivery, both on campus and at a distance mode. For the instructor, tutoring can be done at any time and from anywhere. Online materials can be updated, and learners are able to see the changes at once. When learners are able to access materials on the internet, it is easier for instructors to direct them to appropriate information based on their needs.

Multi-access: Despite teacher, student or tutor, the accessibility of information is made available 24 x 7 days on websites. The challenge part is access of information by users for which project implementers have to update the websites continuously. Adoption of technology in eLearning not only helps the individual but also benefit multiple users at the same time.

Speed: Using electronic resources, Search feature has become quicker and faster to extract the page. Integration of information from one to many, cross-search reference between different publications has become little easy.

Functionality: Starting with content page to Index page with prominent links will ease user navigation skills. e-Resource will also allow user to identify the publication with a single on-mouse click.

eContent: e-Resources can contain a vast amount of information, but more importantly the material can consist of mixed media i.e. images, video, audio and animation which could not be replicated in print.

Storage: With the increasing storage capacities and multi-variant devices, the ability to store and retrieve large amounts of information has become simple and transparent. Various storage devices like Servers, CD-ROMs, Pen Drives, Hard Disks and Internet Bandwidth are improving their capacities to handle substantial amount of content over the web.

8. Challenges and Issues

The recent statistics reveal that there is a dearth of quality teachers for various education programs in the country. It became a major hurdle in providing quality education to students and achieving socio-economic development of the country. Hence, a set of quality experts contribute to build such content that can be made available on websites of the institutes, accessible to all groups of users. To meet this goal, Government of India has recently issued guidelines for e-Content development (UGC, 2012). Another hassle in manual content is search feature which is of course, dynamic in online resources. Retrieval of vast content is so quick with online search feature in e-Content resources. But the challenge lies in the internet penetration which is little slow in India, though we have occupied third position beating Japan recently. Only 14% e-literacy is observed against 74% of literacy rate among the country population. e-Learning and e-Content both are proportionately related to each other in library domain. Particularly, in distance learning institutions the skills up gradation is becoming compulsory. Essentially, the receiver must also possess thorough knowledge in using these technology based literature and online services. Having insufficient internet bandwidth and power constraints are big challenges in the Indian context. Since the technology depends on expensive tools like server, personal computer, scanner, photocopier etc.

9. Conclusion

Global education system has two important features, information and knowledge sharing through technology, but infrastructures makes difficult in present scenario developing knowledge resources. The trend is now switching over to creating books to e-books, contents to e-contents. In conventional mechanism, we tried to generate content for publishing papers, books, magazines. Similarly, with introduction of ICTs, it has equal important to generate digital content that will be there forever on the internet. Technology is fast upgrading so the applications based different technologies can be planned in to user-friendly approach. Thus I must say that role of e-content in the every corner of life, a smart people use smart content and a smart content makes people smart.

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