Open Source Authoring Tools for eContent Development – Issues and Challenges

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Abstract— E-Content is a very power full tool of higher education. E-content is valuable to the learners and also helpful to teachers of all individual instruction systems. E-content is the latest method of instruction that has attracted more attention to gather with the concept of models.
Switching from traditional textbooks to digital course materials is a growing trend in higher education. This development has many advantages for students and faculty in greater interactivity, customizability, and opportunities for social collaboration. Many of the products offered in today's e-content marketplace are shifting from proprietary apps to open standards such as HTML5. Open-standard products and software offer many of the same features as closed applications but provide the additional benefit of working across the most common device platforms. Open-standard products and software also allow for greater longevity, since the e-content can continue to be accessed through various devices even as technologies develop further. Contents used in education can be from a number of sources: eJournals, eBooks eResearch-reports, electronic eLecture-modules, eLecturenotes, and eLecture-slides. This paper discusses a number of open source tools for the development of eContent. Some of the Open source tools that are freely available for e-content development such as Xerte, eXe, GLO Maker, Courselab, LAMS, etc are discussed. The advantages, as well as the disadvantages of such open source tools are analysed. And various ways on howeContent can be promoted and used through the Internet are discussed.
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Keywords— eContent, open source tools, eXe, Xerte, GLO Maker, LAMS

I. Introduction

Electronic content (eContent) or digital content is defined by those involved in creating, providing and distributing information as the digitised content, which is viewed on screen and not on paper. Contents that are produced and stored electronically rather than in print are the result of electronic publishing (e-publishing). The contents can be in any of the following forms:

- any one information type (for example fully textual, only graphics content, or only audio content);
- multimedia or hypermedia (i.e. mixing more than two information type)

Students can take advantage of this new type of content presentation. Results of some studies suggest that involvement with computers through the use of eContents and other new technologies, can promote positive attitudes towards learning and higher achievement among learners. Studies also show that computer-based learning tools lead to significant gains in learner's performance in reading, mathematics, computer knowledge and grammar. Furthermore, computers and technology tend to have more positive effects than negative effects.

The existing academic publications in most HE institutions are in printed and bound forms which has many disadvantages. In addition, the publications have not been widely promoted and as a result their accessibilities have been very limited. Many researches and textbook publications by academics of the institutions, for example, have not been publicised properly and thus not noticed locally, and more importantly, internationally. These problems are easily tackled by producing eContents and distributing them through various strategies which can be accessed efficiently, faster and easily.

To create a proper course for elearning, you need an authoring tool to facilitate this work. The definition of authoring tool is " a program that helps you write using hypertext or multimedia applications and enable you to create a final application merely by linking together objects, such as a paragraph of text, an illustration ,or a song. By defining the objects' relationships to each other,and by sequencing them in an appropriate order, authors (those who use authoring tools) can produce attractive and useful graphics applications. .

Most authoring systems also support a scripting language for more sophisticated applications. Thus, these tools provide many facilities helping the author to create a good e-content for courses. In fact, e-content has very important features that make the work easier than paper-content which are storing, modification, reusability and sharing of information Through this paper, we will focus on some of the open source authoring tools which are freely available such as eXe, Xerte, GLO Maker, LAMS and CourseLab.

II. Advantages of E-content in Higher Education

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Educational institutions are changing rapidly in response to the ability of individuals and universities to access digital content in ways that was unthinkable just five years ago. Students and colleges no longer rely on the traditional methods of information access and content delivery that formed the foundation of educational content in the past.The various advantages that digital content offers over traditional printed material are

- The ability to modify content or just a part of it easily and at a considerably low cost. The same exercise with traditional books is a time consuming and costly affair.
- Easy and cost-effective updating options allow access to the latest information as and when it's available rather than having to wait for the next edition of the book to be printed and made available at stores.
- Searching for the exact subject you're interested in is a breeze with digital content when compared with leafing through a book and reading every word before you're able to find what you're looking for.
- Teachers can put together customized lessons depending on what they think their students are interested in rather than being forced to rely on one or two books alone.
- Digital content takes up a fraction of the storage space that printed matter does, thus freeing up shelves and shelves of space.
- There's also the fact that the less paper we use, the more we're doing to play our part in saving the rain forests and the environment as a whole.
- There's no need to carry around books when you're travelling from place to place. If it's online, all you need is access to a computer and a fast Internet connection..

III. Open Source Softwares

Open source software is a software which codes are free – to – access to the public; and lots of people in the world may join the activities of development such as writing a new code, adding new features, fixing a bug, proposing a new architecture, discussing a current design problem so on. The development of open source software (OSS) started in the mid 1980's and such software is increasing being used in e-learning environment. The open source initiative (www.opensource.org) defines open source software not only in terms of free availability of the source code but also in the provision for the future use of the code in modification and derived works without discrimination against persons or groups or fields of endeavour. The open software initiative is a non profit corporation formed to educate about and advocate for the benefits of OSS and to build bridges among the different constituencies in the open source community. A key definition of OSS is access to the actual source code, often available under a GNU Public Licence[8], which allow programmers to alter the software and redistribute the requirement that they make these changes available to other developers.

IV. Open Source Authoring Tools

E-learning authoring tools enable trainers to integrate an array of media to create professional, engaging, interactive training content, and some make it possible to repurpose digitized elements or learning objects from an existing course for reuse in a new one[1]. Indeed, e-learning course creation tools[2] is probably a more accurate term for this category of software, but authoring tool is the term of choice--for now. The ability of an authoring tool to work with other e-learning software and systems is referred to as interoperability. Successful interoperability is the result of software compliance to technology standards.

The e-learning community has several sets of technology standards and is currently developing additional standards. The ultimate vision is to have interoperability throughout the entire e-learning market. Until then, the e-learning community is fragmented into different systems adhering to various standards. The four most common standards are Aviation Industry Computer-based Training Committee (AICC), Sharable Content Object Reference Model (SCORM), IMS Global Learning Consortium, and Microsoft LRN. Many of the products offered in today's e-content marketplace are shifting from proprietary apps to open standards such as HTML5. Open-standard products and software offer many of the same features as closed applications but provide the additional benefit of working across the most common device platforms. Open-standard products and software also allow for greater longevity, since the e-content can continue to be accessed through various devices even as technologies develop further

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A. *eXe*

eXe stands for e-learning xhtml editor, an authoring application to assist teachers and academics in the publishing of web content without the need to become proficient in HTML or XML markup languages[7]. eXe grew out of the New Zealand Government Tertiary Education Commission's eCollaboration Fund and was led by the University of Auckland, The Auckland University of Technology, and Tairawhiti Polytechnic. It was later supported by CORE Education, a New Zealand-based not-

for-profit educational research and development organisation. It has also been greatly assisted by a global group of participants and contributors.

Features:

- exported in IMS Content Package, SCORM 1.2, or IMS Common Cartridge formats or as simple self-contained web pages
- create sequences of on line learning activities
- activities can be arranged in any order and sequences can be branched
- display equations, images and media files (Quicktime, WMV and Real Media video files)
- simple Multiple Choice Questions (MCQs) and quizzes using various question types: multiple choice, multiple response, true-false
- the presentation of the output can be displayed using a range of available stylesheets (appearances)
- platform

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B. *Xerte*

Xerte is an Open Source content creation tool that allows non-technical staff to quickly and easily build rich, interactive and engaging resources with high levels of accessibility already built in. Xerte was developed by the University of Nottingham supported by JISC Techdis[6].

Features:

- the desktop version allows you to export your content as a zip file (a self-contained web site). For the on-line version of Xerte, the exported content can be private (available to content creator only), password protected, or public.
- create sequences of on-line learning activities
- activities can be arranged in any order and sequences can be branched (available to certain versions only)
- display images, sounds, and movies (FLV, flash, iSpring Movie, Jing Movie, etc)
- add simple quizzes using various question types: multiple choice, multiple response, filling the gap, etc.
- interactive components: hotspot image, Button sequence, drag and drop labelling, etc.
- the presentation of the output can be changed easily by the viewers: colour scheme (red, blue, green, high contrast), screen size (large, full screen, full window), text font, text size and volume.
- embed Google Map, YouTube clip, Delicious bookmarks, QR code.
- currently Windows only, the future version will be platform independent

C. . *GLO Maker*

GLO Maker is an authoring tool for creating rich, interactive learning resources. It builds on the extensive experience of the Centre for Excellence in Teaching and Learning (CETL) in Reusable Learning Objects. It is open source and free for educational use. GLO Maker authoring tool is based on the new concept. Generative Learning Objects (GLO) approach inverts traditional approach for reusability. The traditional approach to the reuse of learning objects has been to separate content from context in order to make the content reusable. However, in GLO, it extracts successful pedagogical designs and makes these the basis for reuse (GLO Maker 2009)[3]. In this design-based approach to learning objects, the designs have to be rendered explicit in two distinct ways. The first form relates to human understanding which is pedagogical design. Then, the design should be rendered to produce learning object based on that design. GLO Maker was developed by London Metropolitan University[9].

Features

- export to a folder which is a self-contained web site
- create sequences of on-line learning activities
- activities can be arranged in any order
- display flash animation, images, MP3, Word Assembly quiz, video player (flv and f4v files)
- simple MCQs
- each page can be applied using a range of available styles(appearances)
- pedagogical guides and examples available
- plan-design- build
- built in patterns: templates or from scratch
- platform independent

D. *Course Lab*

Course Lab is a powerful, easy-to-use, e-learning authoring tool that offers programming-free and WYSIWYG environment[4] for creating high-quality interactive e-learning content.

Features:

- Publish to HTML package.
- Publish to CD-ROM.
- Publish to SCORM 1.2 and SCORM 2004 package for import to any LMS supporting this standard.

E. *LAMS*

LAMS, the Learning Activity Management System, is an open source Learning Design system for designing, managing and delivering online collaborative learning activities. It provides teachers with an intuitive visual authoring environment for creating sequences of learning

activities. These activities can include a range of individual tasks, small group work and whole class activities based on both content and collaboration. LAMS is "inspired" by the concept and principles of IMS Learning Design[5].

LAMS is developed in collaboration with LAMS Foundation, LAMS International, and the Macquarie E-learning Centre Of Excellence (MELCOE), all based in Sydney, Australia, in affiliation with Macquarie University. LAMS has been developed since 2003.

Features:

- live collaborative activities in a computer lab at school,
- online homework activities completed at home or in the library,
- individual instruction or small group work in classrooms with few computers,
- dynamic presentations in conjunction with an interactive whiteboard,
- personalised learning and presenting content (such as TLF Learning Objects), and
- collaboration across several schools, even schools in different countries.

V. Conclusions

.The use of eContent in higher education benefits from hyperlinking, non-linearity, addition of multimedia, portability, customisation and automatic searching. All the above advantages have huge potential in increasing the satisfaction of students, as well as academics. As many HE institutions are introducing electronic content (eContent) through the Web to their students, to choose the best authoring tool to create a proper course for E-learning. In addition, all produced learning contents are conforming to the SCORM standard, which makes better the contents interoperability and reusability. Therefore, Improving authoring tools is important and one of the main points is, to enhance them for the easily usage and having professional output.

This paper proposed several open source authoring tools with the goal of designing and creating the contents which should provide the learner with all the necessary tools. The usage of authoring tool cause the incremental of learner's interaction. Therefore many organizations are attempting to reduce their training costs by developing eContents in-house. Whatever the reason is, more trainers are finding themselves researching the features, benefits, and cost of authoring tools. Choosing an appropriate open source authoring tool in eContent can help to solve many problems including the needs of growing communities to educate people, Lack of access to educational, shortage of training costs and economic opportunities.

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