



International Institute for Educational Planning

INTERNATIONAL COMMUNITY OF INTEREST  
OPEN EDUCATIONAL RESOURCES OPEN CONTENT FOR HIGHER EDUCATION

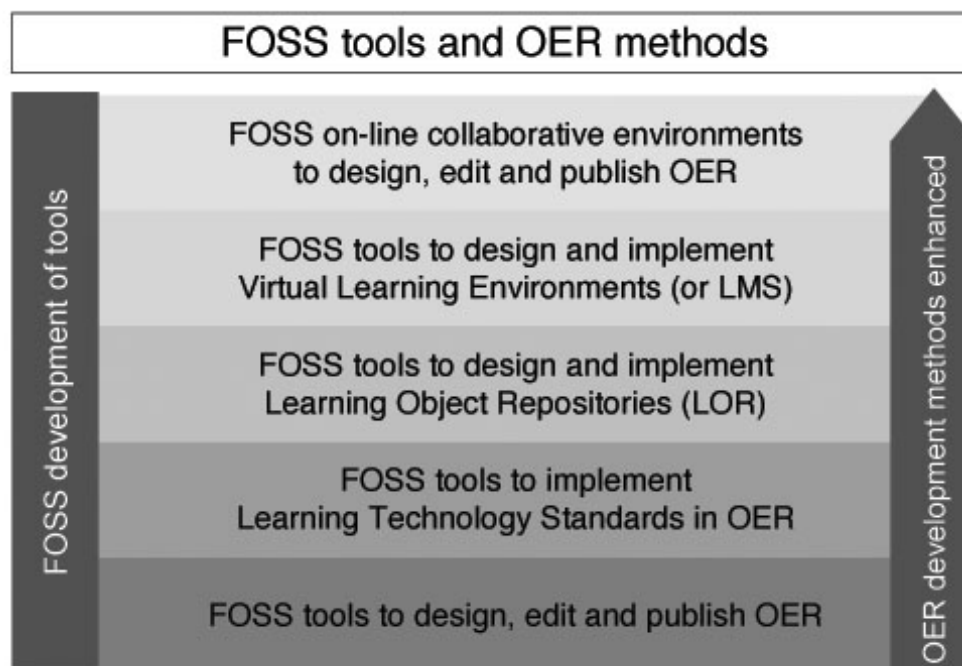
## Report of the discussion on Free and Open Source Software (FOSS) for Open Educational Resources

11 September – 6 October 2006

Appendix: FOSS tools for OER development, management and dissemination<sup>1</sup>

### INTRODUCTORY REMARKS

The discussion in the FOSS Community of FOSS for OER generated a large number of suggested tools. These tools have been grouped in the following categories, progressing from the most elementary to the most advanced, as shown in the figure below:



<sup>1</sup> This appendix is also available on the OER Community wiki, at [http://oerwiki.iiep-unesco.org/index.php?title=Appendix: FOSS tools for OER development%2C management and dissemination](http://oerwiki.iiep-unesco.org/index.php?title=Appendix:_FOSS_tools_for_OER_development%2C_management_and_dissemination).

Under each of these categories is a list of suggested software for OER identified in the FOSS group discussion, and reference information:

- a brief description of the software that has often been taken from the site;
- the direct link to the site.

## 1. FOSS TOOLS TO DESIGN, EDIT AND PUBLISH OER

Most content creators generally use "Office" packages to create, edit and publish teaching and learning materials. Some also include graphics in their materials, while others need audio, video and animation tools. Within each category of application FOSS tools are available for all major Operating Systems (Windows, MacOS and Linux).

- *Open formats* are: .TXT, .PDF, .ODF, .PNG, .SVG, .JPG, .OGG, .MP3, HTML, XHTML and XML.
- *Proprietary formats* include: .DOC, .PPT, .SWF (Macromedia Flash), Adobe Flex, .WAV, .AVI and .MOV.

### OFFICE

[OpenOffice](#) is a real and solid alternative to Microsoft Office. Version 2 was released recently, and documents produced in MS Office can be opened in OpenOffice and vice versa. This question was discussed by Geoffrey Hulme, Vu Do Quynh and other colleagues and best practices exchanged.

[ODF \(Open Document Format\)](#) is an OpenOffice native format to save documents. It was recently recognized by ISO as an open standard. (Open standards provide an open alternative to proprietary document formats so that organizations and individuals can avoid being locked in to a single vendor.) It is being used by many public services. Converters from Microsoft or other FOSS initiatives are or will be available to convert .DOC (Microsoft documents) to .ODF.

OpenOffice can be downloaded [here](#) in around 92 [languages](#). It includes the following programmes:

- *OpenOffice Writer*: text processor, equivalent to MS Word.
- *OpenOffice Draw*: 2D vectorial graphics, equivalent to MS Word graphic tools.
- *OpenOffice Calc*: spread sheet, equivalent to MS Excel.
- *OpenOffice Impress*: presentation, equivalent to MS PowerPoint.
- *OpenOffice Base*: database, equivalent to MS Access.
- *OpenOffice Math*: formula or equation editor, no feature equivalent in MS Office.
- *OpenOffice Pdf Generation*: no feature equivalent in MS Office.

### GRAPHICS PACKAGES

More advanced graphics packages are sometimes necessary to produce 2-dimensional (or 3-dimensional) illustrations, process photography, put together texts and illustrations, and lay out pages, posters, leaflets, text books and other educational resources.

- [Scribus](#) (professional page lay-out)  
An excellent alternative to MS Publisher, Quark Xpress, Adobe Pagemaker or Adobe In Design to lay out any document.

- [Inkscape](#) (2D vectorial graphics)  
Equivalent to Adobe Illustrator.
- [Dia](#) (diagram creation)  
Similar to MS Visio.
- [QCAD](#) (2D CAD)  
A kind of AutoCad software limited to 2-dimensional graphics.
- [Gimp](#) (2D graphics and photo)  
Equivalent to Adobe Photoshop.
- [Blender](#) (3D graphics)  
A powerful 3D modelling, animation, rendering, post-production interactive creation and playback package.
- [Terragen](#) (3D scenery generator and rendering)  
Generates photorealistic landscape and special effects in 3D.
- [TuxPaint](#) (graphic software)  
A simple tool, which can be used by children, as well as adults, to generate basic graphics.
- [Openclips Gallery](#) (free clip art)

## AUDIOVISUAL

Audio and Video digitization, capture and processing demands powerful hardware and advanced software. It generally requires an adapted, more powerful PC; it cannot be achieved smoothly and quietly on a "normal" desktop PC.

- [Audacity](#) (audio editing)  
A FOSS for recording and editing sounds. Audacity can be used to record live audio, convert tapes and records into digital recordings or CDs, edit .OGG, Vorbis, .MP3, and .WAV sound files, cut, copy, splice, and mix sounds together, and change the speed or pitch of a recording.
- [Jahshaka](#) (real-time video editing and visual effects)  
Aims to become a cross-platform, open source, free, video editing, effects, and compositing suite. It is currently in alpha stage. For more information, see [this article](#) from Wikipedia.
- [Cinelera](#) (video editing)  
A software for capturing, compositing, and editing audio and video with sample-level accuracy.
- [VideoLAN](#) (main video formats playing and streaming)  
The VideoLAN streaming solution includes two programs:
  - *VLC media player*: can be used as a server and as a client to stream and receive network streams. VLC is able to stream all that it can read.
  - *VLS (VideoLAN Server)*: can stream MPEG-1, MPEG-2 and MPEG-4 files, DVDs, digital satellite channels, digital terrestrial television channels and live videos on the network in unicast or multicast. Most of the VLS functionality can now be found VLC.
- [iCord](#) (screen video capture)  
A basic FOSS video capture utility to edit animated tutorials. iCord is a Windows application designed to produce screen capture videos in the simplest manner possible. While several other applications exist to do the same thing, they are either much too complex, and/or save to proprietary formats. iCord saves video to standard, editable AVI files.

- **[Camstudio](#)** (screen video and audio capture)  
Able to record all screen and audio activity on your computer and create AVI video files. Using its built-in SWF Producer can turn those AVIs into lean, mean, bandwidth-friendly Streaming Flash videos.

## MULTIMEDIA

Creators of multimedia teaching and learning materials are demanding more advanced technologies to produce and process digital audio, video and animation files.

- **[Pachyderm](#)**  
A FOSS multimedia authoring tool. Designed for people who have little or no multimedia authoring experience, Pachyderm is accessed through a web browser and is easy to use. The Windows installation package is in final testing, and will be available on SourceForge when it is complete. Macintosh and Linux installation packages are also [in development](#).
- **[ConceptTutors](#)**  
Small HTML windows that open from existing web pages to teach concepts in context and at the time of need. They support various media types (images, audio, and animations). Their design is based on best practices for teaching concepts, which is accomplished by providing a concise definition followed by examples and non-examples, contextual information, and quizzing. ConceptTutors is a project of Engage, DoIT Academic Technology and Wisconsin University.
- **[Open Source Flash project](#)**  
Macromedia Flash is a very popular proprietary multimedia authoring application. Flash animation files can be viewed easily by most Internet users, as the Flash viewer plug-in is installed in the majority of web browsers. There are many projects in development to produce a FOSS alternative to Flash, but, as yet, they have yet to produce to a viable FOSS alternative.

## WEB DEVELOPMENT

Distance Learning reached new levels of popularity with the coming of the Internet. For the first time, in around 1993, it was possible to publish something similar to "interactive online multimedia educational material" as web pages (by writing HTML code, with a text processor) and it was like a dream! Thirteen years later this is an easy task that anybody can achieve with web page editing and website management tools, such as the following programmes.

- **[NVU](#)**  
Today, NVU has become a general-purpose FOSS standard for publishing web pages off- or on-line. It was originally part of the Mozilla web application, but became an independent project when the [Firefox](#) web browser split off from the Mozilla project. (Mozilla was a large application, which included web browser, email management and webpage design. The development community of this FOSS project decided to divide it in several smaller projects to make it easier to manage.)
- **[eXe](#)**  
Conceived to address the use of technology in the design and authoring of learning resources for the web. Initial research has shown that while there are many web authoring tools available, their usability and sophistication varied considerably. The project team identified the need for a tool to specifically assist teachers and academics to publish professional looking web pages according to the structure and form required for good teaching, and in such a way that this content could be integrated with existing LMS applications.

## SIMULATIONS

[Simulations](#) in education are somewhat like training simulations. They focus on specific tasks. In the past, video has been used for teachers and education students to observe, problem solve and enact role play. A more recent use of simulations in education, however, includes [animated narrative vignettes](#) (ANV). ANVs are cartoon-like video narratives of hypothetical and reality-based stories involving classroom teaching and learning. ANVs have been used to assess knowledge, problem solving skills and the dispositions of children, and pre- and in-service teachers.

- [Clover](#)

"We have developed and designed Clover, an authoring tool that engages students and teachers in a technology-rich design process to construct animated narrative vignettes (simulations) that deal with school interactions. The tools leads students through the process of constructing a vignette - writing a narrative, writing a script, sketching characters and scenes, animating scenes, and responding to vignettes created by other students"

- [Open Dynamic Engine](#)

"ODE is an open source, high performance library for simulating rigid body dynamics. It is fully featured, stable, mature and platform independent with an easy to use C/C++ API. It has advanced joint types and integrated collision detection with friction. ODE is useful for simulating vehicles, objects in virtual reality environments and virtual creatures. It is currently used in many computer games, 3D authoring tools and simulation tools."

## GAMES

"Educational games are games; board and card games, including video games that are designed to teach people, typically children, about a certain subject, expand concepts, reinforce development, understand an historical event or culture, or assist them in learning a skill as they play." *From Wikipedia article on [educational games](#), which includes a listing of educational games.*

- List of [open source games](#) from Wikipedia: "Open source games are computer games assembled out of, and are themselves, open-source software and open content. For freely available games without or with a partial public license, see [list of freeware games](#)."

## 2. FOSS TOOLS TO IMPLEMENT LEARNING TECHNOLOGY STANDARDS IN OER

### Why are standards important?

"Standards in learning technology will have a powerful impact on the way education will work in the near future. Whether learning takes place in a classroom or over the internet, the relationships between educators, learners, and study materials will be greatly influenced by the development of standards for learning technology." *From [CETIS \(Centre for educational technology interoperability standards\)](#).*

## STANDARDS FOR LEARNING OBJECTS

### Key definitions

- **Content package:** "A content package is used in e-learning to define some learning content or an assessment that can be delivered, for example by a Learning Management System. It's a standard way of describing learning content that can be read by many programs." *From Wikipedia article on [content packages](#) (IMS CP).*
- **Learning Object Metadata (LOM):** "Learning Object Metadata is a data model, usually encoded in XML, used to describe a learning object and similar digital resources used to support learning. The purpose of learning object metadata is to support the reusability of learning objects,

to aid discoverability, and to facilitate their interoperability, usually in the context of online learning management systems (LMS)." *From Wikipedia article on [IEEE LOM](#).*

- **Sharable Content Object Reference Model (SCORM):** "The Sharable Content Object Reference Model (SCORM) defines a Web-based learning "Content Aggregation Model (CAM)" and "Run-Time Environment" (RTE) for learning objects. In essence, the CAM defines how to aggregate, describe and sequence learning objects and the RTE defines the run-time communication and data to be tracked for learning objects. SCORM is a collection of specifications adapted from multiple sources to provide a comprehensive suite of e-learning capabilities that enable interoperability, accessibility and reuse of Web-based learning content." *From [SCORM 2004](#).*

See also [CETIS briefings](#) on different e-learning standards.

## Software

- [Reload Metadata and Content Packaging Editor](#) and [Reload SCORM Player](#)  
"The key [aim](#) of the Reload project is the implementation of a reference-standard Content Package and Metadata Editor. The Reload Editor enables users to organise, aggregate and package learning objects in standard IMS and SCORM content packages tagged with Metadata (in various subsets) and vocabularies."
- [eXe](#)  
A simple, off-line authoring environment that enables teachers and academics to author web content without the need to become proficient in HTML or XML markup. Content generated by eXe can be used inside any Learning Management System, either as SCORM 1.2 packages, IMS Content Packages, or self-contained web sites. eXe enables users to select from predesigned instructional devices (iDevices) or create their own devices like objectives, case studies, reading activities, etc. Users can manipulate the look and feel of their published content as well as export for different display or delivery technologies.
- [Burroket](#)  
"A FLOSS initiative to produce a software tool that allows both easy authoring of content and structuring of IMS content packages in a single environment." *From "[A review and analysis of content authoring software in relation to eXe](#)" by Sandy Britain.*

## IMS LEARNING DESIGN

### What is IMS Learning Design?

"[IMS Learning Design](#) is a metalanguage for describing learning designs that claims to be pedagogically neutral (according to their authors, it does not mandate a specific pedagogical approach). The specification can be likened to a stage-play: People act in different roles. Roles work towards specific objectives by performing learning and/or support activities. Activities are conducted within an environment consisting of learning objects and services. IMS LD is made up of three levels (A, B and C), with each level extending and incorporating the previous: Level A contains the core elements of the meta language. Level B enables the use of generic properties and conditions. Level C provides the ability to use notifications (enables activities to be set dynamically)." *From Wikipedia article on [IMS Learning Design](#).*

See also [CETIS IMS Learning Design overview](#).

## Software

- [Reload Learning Design Editor](#)  
"The Learning Design Editor (based on the IMS Learning Design specifications) allows the creation of re-usable "Pedagogical Templates" allowing the user to define a set of Learning

Objectives, Activities and Learning Environments. These templates can be re-purposed with the user's own content to create on-line Learning Design compliant resources."

- **[Reload Learning Design Player](#)**  
"The Learning Design Player (based on the IMS Learning Design specifications) allows the user to "play" a Unit of Learning. The user may pick any of the Roles and work through the sequence of Plays, Acts, Activities and Environments."
- **[CopperAuthor](#)**  
"CopperAuthor is a combination of an engine/core for manipulating IMS-LD and an IMS-LD editor built on top of it."
- **[Collage \(COLlaborative LeArning desiGn Editor\)](#)**  
Collage is a high-level specialized Learning Design authoring tool for collaborative learning. "Collage helps users in the process of creating their own (collaborative) Learning Designs starting with existing patterns. These patterns are called CLFPs (Collaborative Learning Flow Patterns) and represent broadly accepted techniques that are repetitively used by collaborative learning practitioners when structuring the flow of types of learning activities involved in collaborative learning situations. That is, Collage enables an easy edition of potential effective IMS-LD Units of Learning by reusing and customizing best practices in collaborative learning structuring according to the requirements and conditions of a particular learning scenario."
- **[LAMS \(Learning Activities Management System\)](#)**  
"LAMS is a revolutionary new tool for designing, managing and delivering online collaborative learning activities. It provides teachers with a highly 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."

**N.B.** LAMS is at the moment IMS-LD level A (only) compliant.

## IMS EPORTFOLIO

### Key definitions

- **[IMS ePortfolio specification](#)**: "The IMS ePortfolio specification was created to make ePortfolios interoperable across different systems and institutions. The ePortfolio specification: Supports the advancement of lifelong learning important to many government initiatives. Makes exchanging portfolios from school to work transitions easier. Allows educators and institutions to better track competencies. Enhances the learning experience and improves employee development."
- **[IMS Learner Information Package \(LIP\)](#)**: "A collection of information about a Learner (individual or group learners) or a Producer of learning content (creators, providers or vendors). The IMS Learner Information Package (IMS LIP) specification addresses the interoperability of internet-based Learner Information systems with other systems that support the Internet learning environment."
- **[Reusable Competency Definition \(LTSC-WG20 IEEE\)](#)**: "The purpose of this standard is to define a universally acceptable Competency Definition model to allow the creation, exchange and reuse of Competency Definition in applications such as Learning Management Systems, Competency or Skill Gap Analysis, Learner and other Competency profiles, etc. The standard is needed because there are currently many definitions of the terms "Learning Objective", "Competency" and "Skill", and very little agreement between how those definitions can be used to define reusable data models."

## Software

- **[Open Source Portfolio \(OSP\)](#)**  
"The OSP supports portfolio-based activities by providing an environment in which a person, as a portfolio owner, is able to exhibit their work. A portfolio owner is provided tools: to collect items that best represent their accomplishments, their learning, or their work; to reflect upon these items and their connections; to design a portfolio that showcases the best selections of this work; and to publish the portfolio to a designated audience. Tools are also available for coordinators of Common Interest Groups (CIG) or program evaluators and administrators that allow users in these roles to provide structure and guidance for portfolio owners regarding portfolio development. CIG coordinators, evaluators, reviewers and portfolio guests are able to review published portfolios and provide formal evaluation or informal feedback and comments. Tools for analysis of portfolio items in aggregate also make it possible for CIG coordinators, administrators or program evaluators to measure program effectiveness or educational outcomes."
- **[NZ ePortfolio project](#)**  
"This project is a collaborative venture funded by the Ministry of Education's e-learning Collaborative Development Fund (eCDF), involving Massey University (lead provider), the Auckland University of Technology, the Open Polytechnic of New Zealand, and Victoria University of Wellington. The purpose of this joint project is to develop an electronic portfolio (ePortfolio) application for the New Zealand tertiary sector, and to provide guidelines for its effective use."
- **[LUSID project](#)**  
"LUSID enables you to: record your experiences and achievements and to reflect on them in terms of skills which might well be useful for employment; to keep a journal or log; to plan goals and activities; to perform skills audits and access skills guidance and to automatically construct your CV."
- **[TENCompetence project](#)**  
"TENCompetence will support individuals, groups and organisations in Europe in lifelong competence development by establishing the most appropriate technical and organisational infrastructure, using open source standards-based, sustainable and innovative technology."

## 3. FOSS TOOLS TO DESIGN AND IMPLEMENT LEARNING OBJECT REPOSITORIES

### Learning Object Repositories: a definition

"A Learning Object Repository is storing content/assets/resources as well as their metadata record."  
*From [EduTools Glossary Analysis](#).*

### Background resources

Two excellent reports from [Jorum](#) may be a good reference:

- Report on [Open Source Learning Object Repository Systems](#).
- [E-learning Repository Systems Research Watch](#).

### GENERAL DIGITAL REPOSITORY SYSTEMS

"A digital repository is either a local, institutional, or central (e.g., subject- or discipline-based) digital archive for depositing and providing access to digital contents." *From Wikipedia article on [digital repositories](#).*



- [Fedora](#)  
"Fedora open source software gives organizations a flexible service-oriented architecture for managing and delivering their digital content."
- [DSpace](#)  
"A groundbreaking digital repository system that captures, stores, indexes, preserves, and redistributes an organization's research data."
- [ePrints](#)  
"Both a practical tool and the crystallization of a philosophy, it enables research to be accessible to all, and provides the foundation for all academic institutions to create their own research repositories."

#### SPECIFIC LEARNING OBJECT REPOSITORY PROJECTS

- [eRIB](#)  
"The eduSource Repository-In-A-Box (eRIB) is aimed at organizations or single users who wish to create a repository of learning object metadata records. The eRIB provides all the basic tools to add a new node to the eduSource network. It consists of an open source database (eXist) with a built-in LOM (IEEE Learning Object Metadata) data structure and a set of tools to create, manage and find metadata records in the eduSource Network."
- [CAREO](#)  
"The CAREO repository is actually composed of 2 separate components: the ALOHA Server, which acts as a metadata management server, and the CAREO web application, which is used as the primary interface to the repository."
- [LeMill](#)  
"A web community for finding, authoring and sharing learning resources. First at all, you can find learning resources. You can use the resources you find in your own teaching or learning. You can also add your own learning content to LeMill. You may edit your content and combine larger chunks of learning resources from individual media pieces. If you wish you may also join some of the groups producing or editing learning resources. In LeMill the content is always easily found where and whenever you need them."
- [CALIBRATE European project](#)  
"The CALIBRATE (Calibrating eLearning in Schools) project (October 2005 – March 2008) brings together eight Ministries of Education, (including six MoEs from new member states), to carry out a multi-level project designed to support the collaborative use and exchange of learning resources in schools."
- **iTunes**  
Podcasting audio or video files is very popular and has a number of educational application - see, for example [Stanford on iTunes](#).  
  
**N.B.** iTunes is proprietary. It is not a free application, although the podcasts may be free to download. Some FOSS alternatives may be available soon - see, for example [Songbird](#).

#### STANDARDS SPECIFICATION/MODELS FOR LEARNING OBJECTS REPOSITORIES

- [IMS DR](#)  
"The IMS Digital Repositories v1.0 Final specification, released January 30, 2003, purpose is to provide recommendations for the interoperation of the most common repository functions. These recommendations should be implementable across services to enable them to present a common interface. On the broadest level, this specification defines digital repositories as being any collection of resources that are accessible via a network without prior knowledge of the structure

of the collection. Repositories may hold actual assets or the meta-data that describe assets. The assets and their meta-data do not need to be held in the same repository."

- [\*\*CORDRA \(Content Object Repository Discovery and Registration/Resolution Architecture\)\*\*](#)  
"An open, standards-based model for how to design and implement software systems for the purposes of discovery, sharing and reuse of learning content through the establishment of interoperable federations of learning content repositories."

## 4. FOSS TOOLS TO DESIGN AND IMPLEMENT VIRTUAL LEARNING ENVIRONMENTS/LEARNING MANAGEMENT SYSTEMS

### Background resources

For an introduction to Virtual Learning Environments (VLEs), see the first two links to articles from Wikipedia. The final link is to an EduTools comparison of VLE features.

- [Definition of VLEs](#)
- [History of VLEs](#)
- [Compare VLE features](#)

### WEB-BASED VLE/LMS

- [\*\*Moodle \(Modular Object-Oriented Dynamic Learning Environment\)\*\*](#)  
"An open source e-learning platform (also known as a Course Management System (CMS) or Virtual Learning Environment (VLE)). It has a very large user base with 13,909 registered sites in 158 countries with 4,972,676 users in 455,685 courses (as of August 2, 2006). Moodle is designed to help educators create online courses with opportunities for rich interaction. Its open source license and modular design means that many people can develop additional functionality, and development is undertaken by a globally diffuse network of commercial and non-commercial users, spearheaded by the Moodle company based in Perth, Western Australia." *From Wikipedia article on [Moodle](#).*
- [\*\*Sakai\*\*](#)  
"An online Collaboration and Learning Environment. Many users of Sakai deploy it to support teaching and learning, ad hoc group collaboration, support for portfolios and research collaboration."
- [\*\*aTutor\*\*](#)  
"An Open Source Web-based Learning Content Management System (LCMS) designed with accessibility and adaptability in mind. Administrators can install or update ATutor in minutes, develop custom templates to give ATutor a new look, and easily extend its functionality with feature modules. Educators can quickly assemble, package, and redistribute Web-based instructional content, easily retrieve and import prepackaged content, and conduct their courses online. Students learn in an adaptive learning environment."
- [\*\*.LRN\*\*](#)  
"The world's most widely adopted enterprise-class open source software for supporting e-learning and digital communities. Originally developed at MIT, .LRN is used worldwide by over half a million users in higher education, government, non-profit, and K-12."

- [Dokeos](#)  
"An Open Source elearning and course management web application translated in 34 languages and helping more than 1.000 organisations worldwide to manage learning and collaboration activities."
- [Claroline](#)  
"A free application based on PHP/MySQL allowing teachers or education organizations to create and administrate courses through the web. Developed from teachers to teachers, Claroline is built over sound pedagogical principles allowing a large variety of pedagogical setup including widening of traditional classroom and online collaborative learning."
- [ILIAS](#)  
"A powerful web-based learning management system that allows users to create, edit and publish learning and teaching material in an integrated system with their normal web browsers. Tools for cooperative working and communication are included as well. ILIAS is available as open source software under the GNU General Public License (GPL). Universities, educational institutions, private and public companies, and every interested person may use the system free of charge and contribute to its further development."

#### SIMPLE WEB-BASED COLLABORATIVE LEARNING ENVIRONMENTS

- [Fle3](#) (web-based collaborative learning and knowledge building)  
"Designed to support learner and group centered work that concentrates on creating and developing expressions of knowledge (i.e. knowledge artefacts) and design. Fle3 contains three learning tools and several administration tools."

#### PEER-2-PEER EMAIL-BASED VLES

- [Colloquia](#)  
"A software system that supports group working and group learning. It allows any user to set up a working or learning group around a particular topic (a context), add people to it, add resources (web pages, documents etc) to it, set up group tasks, and then engage in group and personal "conversations" about the topic."

#### CONTENT MANAGEMENT SYSTEMS

FOSS Content Management Systems (CMS) can be used to design and implement Virtual Learning Environments/Learning Management Systems.

The following links may be useful:

- [Compare CMS features](#)
- [Try FOSS CMS online before installing](#)

#### Software

- [Plone](#)  
"An open-source content management system built on top of the Python application server Zope and its accompanying Zope Content Management Framework. Plone is free software and is designed to be extensible. It can be used as an intranet or extranet server, document publishing system, and groupware tool for collaboration between separately located entities. Plone is released under the GNU General Public License. Development is often furthered by periodic hackathons called Plone Sprints. Plone is customized using Products, which are distributed both through the Plone website and through a variety of independent websites. The Plone Foundation owns and protects all intellectual property and trademarks. Plone also has legal backing from the experts at Software Freedom Law Center." *From Wikipedia article on [Plone](#).*

- **[Drupal](#)**  
"A modular content management framework, content management system and blogging engine which was originally written by Dries Buytaert as a bulletin board system. Today, it is used by many high-traffic websites, including The Onion, Spread Firefox (CivicSpace...), Ourmedia, KernelTrap, and the Defective by Design campaign. Drupal is written in PHP." *From Wikipedia article on [Drupal](#).*
- **[Elgg](#)**  
"A new breed of social software based around choice, flexibility and openness: a system that firmly places individuals at the centre of their activities. With the freedom to incorporate all of your favorite tools within one environment, Elgg allows you to showcase your content with as many or as few people as you choose."

## PERSONAL LEARNING ENVIRONMENTS

"The last five years have seen a major uptake of VLEs by colleges and universities. The vast majority of these are large, institutional systems, which are predominantly course based providing support for content distribution, discussion and assessment, mainly through proprietary tools. There are several problems with this approach of which two are of most concern. VLEs are not easily customised to suit the needs and preferences of individuals. As learners move between institutions, they may need to learn the interfaces to different VLEs. An alternative approach would be to locate a large amount of VLE functionality with the learner either as a desktop application or an independently hosted portal. Institutions would still provide content via repositories, undertake assessment and so on, but learners would interact with these using their personal systems (Personal Learning Environment), comprising their preferred tools and ways of working." *From [CETIS PLE project](#).*

- **Plex**  
The first application implementating the concept of the "Personal Learning Environment".
  - [Download Plex](#)
  - [Plex tutorial](#)

## 5. FOSS ONLINE COLLABORATIVE ENVIRONMENTS TO DESIGN, EDIT AND PUBLISH OER

### GENERAL ONLINE COLLABORATIVE SERVICES OR APPLICATIONS

#### **Blogs**

"A blog is a website where entries are made in journal style and displayed in a reverse chronological order. Blogs often provide commentary or news on a particular subject, such as food, politics, or local news; some function as more personal online diaries. A typical blog combines text, images, and links to other blogs, web pages, and other media related to its topic. Most blogs are primarily textual although some focus on photographs (photoblog), videos (vlog), or audio (podcasting), and are part of a wider network of social media. The term "blog" is a contraction of "Web log". "Blog" can also be used as a verb, meaning to maintain or add content to a blog." *From Wikipedia article on [blogs](#).*

- **[WordPress](#)**  
"A state-of-the-art semantic personal publishing platform with a focus on aesthetics, web standards, and usability. What a mouthful. WordPress is both free and priceless at the same time. More simply, WordPress is what you use when you want to work with your blogging software, not fight it."

- [Pixelpost](#)  
"A photoblog application powered by PHP and MySQL. It's developed and maintained by photobloggers who like to keep the meaning behind photoblogging in mind, the photography, and not about the 311 hacks you would have to get through to get your regular blog to work."
- [Serendipity](#)  
"A weblog...system, implemented with PHP. It is standards compliant, feature rich and open source (BSD License). Serendipity is a PHP-powered weblog application which gives the user an easy way to maintain an online diary, weblog or even a complete homepage. While the default package is designed for the casual blogger, Serendipity offers a flexible, expandable and easy-to-use framework with the power for professional applications."
- [Textpattern](#)  
"Built into Textpattern is Textile, a simple syntax for nudging plain text into structurally sound and stylistically rich web content. Ordinarily fussy text amendments such as headers, hyperlinks, image tags and tables are created with one or two simple markers. Compared to navigating the tag soup of markup, writing and revising with Textile is much more intuitive, being closer to working with ordinary text. Once you're ready to publish, copy marked up with Textile is automatically converted to valid XHTML, and because Textpattern stores both versions of each article, revising and updating is a snap."

## Wikis

### Background resources

- [List of wiki software on Wikipedia](#)
- [Comparison of wiki software on Wikipedia](#)

### Software

- [MediaWiki](#)  
"A free software wiki package originally written for Wikipedia. It is now used by several other projects of the non-profit Wikimedia Foundation and by many other wikis" - including the wiki of the IIEP OER Community!
- [Wikipedia](#): "A multilingual, Web-based free content encyclopedia project. The name Wikipedia is a combination of the words wiki and encyclopedia. Wikipedia is written collaboratively by volunteers, allowing most articles to be changed by almost anyone with access to the website. Wikipedia's main servers are in Tampa, Florida, with additional servers in Amsterdam and Seoul. Wikipedia was launched as an English language project on January 15, 2001 as a complement to the expert-written and now defunct Nupedia, and is now operated by the non-profit Wikimedia Foundation. It was created by Larry Sanger and Jimmy Wales... Currently Wikipedia has more than 5 million articles in many languages, including 1,423,521 in the English-language version. There are 229 language editions of Wikipedia, sixteen of which have more than 50,000 articles each..."
- [TWiki](#)  
"An enterprise collaboration platform and knowledge management system. It is a structured wiki, typically used to run a project development space, a document management system, a knowledge base, or any other groupware tool, on an intranet or on the internet. Web content can be created collaboratively by using just a browser. Users without programming skills can create wiki applications. Developers can extend the functionality of TWiki with plugins." *From [TWiki Wikipedia article](#).*
- [Trac](#)  
"An enhanced wiki and issue tracking system for software development projects. Trac uses a minimalistic approach to web-based software project management. Our mission; to help

developers write great software while staying out of the way. Trac should impose as little as possible on a team's established development process and policies. It provides an interface to Subversion, an integrated Wiki and convenient report facilities. Trac allows wiki markup in issue descriptions and commit messages, creating links and seamless references between bugs, tasks, changesets, files and wiki pages. A timeline shows all project events in order, making getting an overview of the project and tracking progress very easy."

- **[DokuWiki](#)**

"A standards compliant, simple to use Wiki, mainly aimed at creating documentation of any kind. It is targeted at developer teams, workgroups and small companies. It has a simple but powerful syntax which makes sure the datafiles remain readable outside the Wiki and eases the creation of structured texts. All data is stored in plain text files – no database is required."

- **[PhpWiki](#)**

"A wiki software written in PHP. The first version, by Steve Wainstead, was in December 1999 and was the first Wiki written in PHP to be publicly released. The first version ran under PHP 3.x and ran on DBM files only. It was a feature-for-feature reimplemention of the original WikiWikiWeb at c2.com. In early 2000 Arno Hollosi contributed a second database library to run PhpWiki on MySQL; from then on the features and contributions started to pile up, including a templating system, color diffs, rewrites of the rendering engine and much more." From [PhpWiki Wikipedia article](#).

### Other general collaborative programmes

- **[Writely](#)**

An online collaborative word processor. With Writely, users can:

- Upload Word documents, OpenOffice, RTF, HTML or text (or create documents from scratch).
- Use simple WYSIWYG editor to format, spell-check documents, etc.
- Invite others to share documents (by e-mail address).
- Edit documents online with whomever they choose.
- View documents' revision history and roll back to any version.
- Publish documents online to the world, or just to selected users.
- Download documents to the desktop as Word, OpenOffice, RTF, PDF, HTML or zip.
- Post documents to a blog.

- **[SynchroEdit](#)**

A browser-based simultaneous multiuser FOSS editor, which can be installed on a user's server. "Can be used for any functionality where concurrent, synchronous editing of a single document is useful. It can easily be plugged into web pages using a variety of methods. Following are some of the current uses being considered:

- *Collaborative Editing* — Two or more people can edit a document at exactly the same time, fine-tuning specific wordings and phrases.
- *Teleconferencing Notes* — Members of a teleconference can write about their call, correcting or expanding upon notes made by other call members, thus supporting a true backchannel to a live conference call.
- *Wiki Editing* — Editors can edit popular or heavily edited Wiki pages at the same time, instead of having to wait for their colleagues to complete their work.
- *Pair/XP Programming, Agile Development* — Two or more programmers or web developers can write code at the same time.

- *Teaching Aids* — Teachers can provide dynamic syllabi and lecture notes, and students can take shared class notes together.
- *Documentation Writing* — Authors with a variety of expertise can come together to write a coherent document on a specific topic. This overview of SynchroEdit was originally written in SynchroEdit by multiple people.
- *Conferences* — SynchroEdit can be (and is) used in conjunction with conferences, with sessions set up corresponding to the sessions in the conference itself."
- **VUE (Visual Understanding Environment)** (collaborative concept mapping)  
 "As the availability of digital information continues to increase, there is a need for flexible tools that help faculty and students integrate electronic content into their teaching and learning. While numerous applications are available for locating digital information, few tools exist for selecting, organizing and making sense of the information available to us. The Visual Understanding Environment (VUE) is an information management application that provides an interactive, concept mapping interface to digital resources accessed via the web, from FEDORA-based digital repositories, ftp servers or local file systems. Using a simple set of tools and a basic visual grammar consisting of nodes and links, faculty and students may map relationships between digital content to capture and communicate concepts and ideas. The resulting content maps can then be shared with others. VUE leverages the cognitive benefits of concept mapping as an interface and information visualization techniques to support the creation of rich resource-based, instructional or research-oriented presentations."

## OER-DEDICATED COLLABORATIVE ENVIRONMENTS

- **Rhaptos/Connexions**  
 "Rhaptos is a collaborative authoring and publishing system built by Connexions for open-content educational materials... Rhaptos features private workspaces as well as shared, collaborative areas called workgroups. Content in a work area is not publicly visible until it is published in the repository.
  - *Modules* are the basic building block on content in the Rhaptos system. Each module maps to a single web page, but may also be viewed as a PDF. Modules have metadata like keywords and an abstract, may have multiple authors and a set of supplementary links. Modules are written in CNXML, but can import content from a variety of sources including Microsoft Word. Rhaptos included an easy-to-use web-based editor for modules called Edit-In-Place.
  - *Courses* allow instructors to build a custom sequence of modules for their students. Courses allow instructors to provide custom titles, annotations, supplementary links, and even mathematical notation for modules viewed in the context of the course. The same module may be customized in completely different ways in different courses.
  - All content is stored under version control in the Rhaptos content *repository*. This allows earlier versions to be viewed and compared at any time. The repository can be browsed via the web by title, author, keyword, or popularity. It can also be queried using the Open Archives Initiative protocol or the OpenSearch protocol."
- **EduCommons**  
 "An OpenCourseWare management system designed specifically to support OpenCourseWare projects... eduCommons will help you develop and manage an open access collection of course materials. eduCommons is built around a workflow process that guides users through the process of publishing materials in an openly accessible format. This includes uploading materials into a repository, dealing with copyright, reassembling materials into courses, providing quality assurance, and publication of materials."

- [LeMill](#)

"A web portal for authoring and sharing learning resources. Its main target group are teachers and learning content authors, but anyone is free to join. All the resources are freely usable by anyone in any context (CC BY-SA 2.5 license). The portal is divided into four sections:

- The *content* section contains all learning resources (or learning objects, or learning material, or ...) and media pieces (or media files) in the system.
- The *activity* section contains descriptions of different learning activities (or pedagogical techniques, or pedagogical templates, or learning patterns...). They are a valuable source of new ideas for teachers who want to use different methods in their teaching. Activities contain both pedagogical theories and individual techniques that can be employed in different learning scenarios.
- The *tools* section contains descriptions of tools that can be used in teaching and learning. The tools can be both physical (such as a class room, or a blackboard) and virtual (a VLE, for example). The tools are edited in exactly the same way as activities - wiki style.
- The *community* section allows you to browse the other members. Any contact information that members have chosen to share are visible to you. Members can provide quite a bit of information about themselves, allowing you to find interesting people that you could possibly collaborate with. The community section also contains all the groups that have been established. Anyone can create a new group, and anyone can join any existing group. All groups have one blog that the group members can use to communicate with each other, coordinate their collaborative efforts, and report on their progress."

**N.B.** LeMill is also part of the European Schoolnet's Learning Resource Exchange Portal. In the context of the EUN LRE Portal, LeMill is referred to as the "Learning Toolbox", since it contains the authoring tools of the portal.

- [LAMS \(Learning Activities Management System\)](#)

An Australian invention that has become the world's leading software for creating and running digital lesson plans. Its unique drag-and-drop interface transforms lesson planning into a simple, visual experience. The system is being used in all forms of education: schools, vocational training, higher education, adult/community learning and corporate training. The greatest interest in LAMS to date has been in schools and universities, followed by vocational training.

Teachers use LAMS to design a sequence of learning activities for students that includes content (Learning Objects) and collaborative tasks. LAMS then "runs" the sequence of tasks for students, and provides teachers with a monitoring environment to track student progress. Teachers can design and run a lesson plan in under 10 minutes using LAMS. The lesson plans can also be shared, so that other teachers can use (and adapt) LAMS sequences.

In school settings, LAMS can be used for:

- 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.

LAMS is released as freely available open source software by the non-profit LAMS Foundation (backed by Macquarie University). A separate commercial services company (LAMS International Pty Ltd) offers optional fee-based technical support, training, etc.



- [WikiEducator](#)

Project for OER collaborative development based on MediaWiki and eXe.

“While combining the power of Mediawiki software with the ease of refining content for eLearning using eXe is a significant development for the Open Education Resource (OER) movement, there is always room for improvement.

This...highlights ideas for the future development of both Mediawiki, eXe and Educommons for educational purposes. The advantages of a social authoring model are clearly demonstrated by the success of Wikipedia. However, there are two shortcomings of this authoring model for educational content:

- First the academic requirement for a robust technology that provides workflow processes for quality assurance of free content developed dynamically using social software. In other words, quality assurance for a static version of content developed in a wiki environment. Educommons provides the best fit among open source technologies for this purpose.
- Second, technologies that facilitate easy authoring of the microelements of educational content, for example learning objectives, case studies, interactive question types etc. These are the educational "widgets" that can be embedded in a web page. The eXe has made considerable progress with developing examples of these microelements (called instructional devices or iDevices). However, we do not have seamless import/export capabilities with technologies like Mediawiki and Educommons.

*A sustainability thought:* The rate of FLOSS development is proportional to the size of the community that uses these technologies. A large user base contributes to the development of a rich variety of content resources as well as informing the software developers of feature requirements for the future. The greater the demand, the easier it becomes to secure funding for ongoing development and improvement. This way we will achieve our ideals of "new" pedagogy building through the smart implementation of Web 2 technologies for learning. The open movement is well equipped to make the future happen because they have the freedom to do so.”  
*From "[The future of WikiEducator](#)".*

## WEB 2.0 (OR ELEARNING 2.0) INNOVATIVE AND COLLABORATIVE WEB SERVICES

### What is Web 2.0/eLearning 2.0?

- [Stephen Downes](#): "e-learning is evolving with the World Wide Web as a whole and it's changing to a degree significant enough to warrant a new name: E-learning 2.0."
- [David Jennings](#): "What is E-learning 2.0? Well first of all it's a rhetorical manoeuvre by e-learning suppliers and consultants to distance themselves from the failures of the first wave of e-learning. Secondly it appears to be the bastard neologism offspring of e-learning and Web 2.0 technologies."
- [Learning 2.0 Tip of the Week podcast](#): Kathleen Gilroy, Founder and CEO of the Otter Group, offers weekly insights on learning in the world of Web 2.0.
- [Definition and criticism of Web 2.0 from Wikipedia](#)  
**N.B.** Wikipedia itself is a Web 2.0 application and it is making a fair use of FOSS technology and principles (it's motor, [MediaWiki](#), is a FOSS application).
- [Tim Berners-Lee on Web 2.0](#): "When asked if it's fair to say that the difference between (Web 1.0 and Web 2.0) might be fairly described as 'Web 1.0 is about connecting computers, while Web 2.0 is about connecting people,' Tim Berners-Lee replied, 'Totally not. Web 1.0 was all about connecting people. It was an interactive space, and I think Web 2.0 is of course a piece of jargon, nobody even knows what it means. If Web 2.0 for you is blogs and wikis, then that is people to people. But that was what the Web was supposed to be all along. And in fact, you know, this 'Web 2.0,' it means using the standards which have been produced by all these people working on Web 1.0.'"

## FOSS and Web 2.0

Most popular Web 2.0 services and applications are based on FOSS solutions, but few apply FOSS principles. (See [Wikipedia LAMP article](#) for more information.)

The following links provide more reflection on the relationships between FOSS and Web 2.0:

- [Report of a panel discussion on open source and Web 2.0](#), on the O'Reilly Network, with Tim O'Reilly, Founder and CEO of O'Reilly Media, Mitchell Baker, President of the Mozilla Foundation, and Jonathan Schwartz, President and CEO of Sun Microsystems.
- [Open Source: architecture or goodwill?](#): article by Tim O'Reilly on open source in the world of Web 2.0
- [Impact of rise of Web 2.0 applications on open source](#): the importance of open standards for preserving ownership of and access to data (Open Board blog post).

## Web 2.0 services/applications

Many Web 2.0 services can help to develop and support OER creation and use, or collaborative learning (with some restrictions and risks).

- [Basecamp](#)  
"A unique project collaboration tool. Projects don't fail from a lack of charts, graphs, or reports, they fail from a lack of communication and collaboration. Basecamp makes it simple to communicate and collaborate on projects. Basecamp is elegant, dead simple, and web-based (and it even looks great on paper). You don't need to download, install, or configure anything (no IT staff required). All you need is a web browser and an internet connection. And don't worry, your data is safe with us. Basecamp makes it easy to centralize group communication with co-workers and clients."
- [del.icio.us](#)  
An online collection of favorite bookmarks about technology, entertainment, useful information, etc., collected by users. Users can use del.icio.us to:
  - keep links to favorite articles, blogs, music, reviews, recipes, and more, and access them from any computer on the web;
  - share favorites with friends, family, coworkers, and the del.icio.us community;
  - discover new things. Everything on del.icio.us is someone's favorite - they've already done the work of finding it.
- [Odeo](#)  
"A creative way to record and share audio and it's free. You can record audio and then share it with your Odeo contacts, by email, or by placing it in a Channel for all the world to hear. Audio from Odeo can be downloaded to desktops, iPods, and mp3 players. We're working to make sharing audio via the web better and as easy as possible."
- [Flickr](#)  
"A way to get your photos to the people who matter to you. With Flickr you can:
  - Show off your favorite photos to the world
  - Blog the photos you take with a cameraphone
  - Securely and privately show photos to your friends and family around the world."
- [YouTube](#)  
"A place for people to engage in new ways with video by sharing, commenting on, and viewing videos. YouTube originally started as a personal video sharing service, and has grown into an

entertainment destination with people watching more than 70 million videos on the site daily. With YouTube, people can:

- Upload, tag and share videos worldwide
- Browse millions of original videos uploaded by community members
- Find, join and create video groups to connect with people who have similar interests
- Customize the experience by subscribing to member videos, saving favorites, and creating playlists
- Integrate YouTube videos on websites using video embeds or APIs
- Make videos public or private—users can elect to broadcast their videos publicly or share them privately with friends and family upon upload.

YouTube is building a community that is highly motivated to watch and share videos. The service is free for everyone."