



# Designing e-learning materials with learning objects

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# Introduction

- E-learning materials are the inevitable part of today's educational environment
- new approach in the development of hyper-textual educational materials is based on learning objects
- learning object is an element of content that is smaller than a course or a lesson; should be stored electronically, reusable, and deployed in different formats

# Learning object

- "Learning object" is a term first introduced by Wayne Hodgins in 1994 and it could be found under synonyms such as:
  - reusable learning object (RLO),
  - reusable information object,
  - sharable content object (SCO),
  - modular building block.

# Learning object

- "... is any digital resource that can be reused to support learning. ... The main idea of "learning objects" is to break educational content down into small chunks that can be reused in various learning environments, in the spirit of object-oriented programming."

David Wiley

# Learning objects should have characteristics such as:

- **reusability**, so that learning content is modularised into small units suitable for use in various course curriculums;
- **interoperability**, to operate regardless of the developer or the learning management system;
- **durability**, designed so that they could survive ever-changing information technologies;
- **accessibility**, so that learning objects should and could be accessed and reused across the network.

- Interchange possibilities of learning objects have very soon resulted in two activities:
  - One - organizing communities of authors who are ready to freely interchange their products and
  - Two - dealing with the compatibility of learning objects.
- Educational community has paid a great deal of attention to the standardization of learning objects.
- The standard makes it easier to find, evaluate and share learning objects and ensures that objects in one system are understood readily in other systems.

# Initiatives for standardisation

## ■ EU

- DCMI-The Dublin Core Metadata Initiative
- ADRIADNE-Alliance of Remote Instructional and Distribution Networks for Europe

## ■ US

- IMS-Global Learning Consortium
- ADL-Advanced Distributed Learning
- IEEE-The US Institute of Electrical and Electronics Engineers

## ■ International

- ISO-International Standardization Organization



# Dublin Core Metadata Initiative®

*Making it easier to find information.*

<http://www.dublincore.org/>

- In Europe DCMI (The Dublin Core Metadata Initiative) was formed as an organization dedicated to promoting the widespread adoption of interoperable metadata standards and developing specialized metadata vocabularies for describing resources that enable more intelligent information discovery systems.
- The mission of DCMI is to make it easier to find and use resources using the Internet.
- Documents such as DCMI Metadata Terms, DCMI Type Vocabulary and DCMI Grammatical Principles have been delivered. The grammar presents the typology of DCMI metadata terms and describes the principles underlying their definition and use.





ARIADNE Foundation  
for the European Knowledge Pool

<http://www.ariadne-eu.org/>

- ARIADNE Educational Metadata specification (the 'pedagogical header') was developed as the educational standard, which was one of the ingredients in the creation of IEEE/LTSC LOM Standard



IMS Global Learning Consortium, Inc.

*Open Specifications for Interoperable Learning Technology*

<http://www.imsproject.org/>

- defines rules to describe learning contents in the IMS Meta-data Specification.
  - Without such a metadata description one would find it difficult to build interoperability into learning objects. Here learning content is described in details such as a description of the content, the title, the author, location (URL), cost and payment structure, prerequisites, learning taxonomy and so on.



[www.adlnet.org](http://www.adlnet.org)

## Advanced Distributed Learning

- As a result of its work was defined the Sharable Content Object Reference Model (SCORM)
  - SCORM is a model for defining, packaging, and managing learning objects.



<http://ltsc.ieee.org/>

## The US Institute of Electrical and Electronics Engineers

- Some of the most important work has been done under IEEE with its Learning Technology Standards Committee (IEEE-LTSC).



<http://ltsc.ieee.org/>

- As the first result IEEE-LTSC delivered
  - Learning Object Metadata Standard (LOM) 1484.12.1-2002. In it LTSC is developing technical standards, recommended practices and guides for learning technology. Further work is underway.

[http://www.imslobal.org/metadata/mdv1p3pd/imsmd\\_bestv1p3pd.html](http://www.imslobal.org/metadata/mdv1p3pd/imsmd_bestv1p3pd.html)

- International ISO has also given its contribution to the field with the vocabulary and definition terms. The results are as follows:
  - ISO/IEC JTC1 SC36 (Information Technology for Learning, Education, and Training) and
  - ISO/IEC JTC1 SC36 WG1 NO 041 (Vocabulary).
  - In these standards technical terms related to information technologies and terms used in traditional educational theory and practice are defined.



<http://jtc1sc36.org/>

# Comunities supporting and developing learning objects

- There is a long list of communities organized around universities where attention is paid to promoting online learning.
- Among them the most sucessful and well known are:
  - **MERLOT** (Multimedia Educational Resource for Learning and Online Teaching);
  - **ARIADNE** (The Foundation for the European Knowledge Pool) which was created to exploit and further develop the results of ARIADNE and ARIADNE II European Projects;
  - **IADIS** (International Association for the Development of the Information Society) is one among non-profit associations highly supporting Web based online learning communities.



<http://www.merlot.org/Home.po>

- is one of the most popular communities of people who are involved in education. It has a free and open resource designed primarily for faculty and students of higher education.
  - MERLOT promotes standardization in the field adopting its IEEE LOM Standard as a working platform for online material development.
  - MERLOT Discipline Communities are focused on specific disciplines and are subject areas in which MERLOT Editorial Boards conduct peer review of materials.
  - MERLOT Special Interest Communities are many –one such community; CATS (Community of Academic Technology Staff) deals with tools and methods for online materials development.



<http://www.ariadne-eu.org/>

*ARIADNE Foundation  
for the European Knowledge Pool*

- The basic mission of ARIADNE is to enable better quality learning through the development of learning objects, tools and methodologies that enable a “share and reuse” approach for education and computer supported training.
- The goals of the Association are as follows:
  - to improve the quality and efficiency of educational systems by the sharing and reuse of knowledge components,
  - to foster the creation of new knowledge components and to make them easily accessible and reusable,
  - to promote the appropriate use in education and training of information and communication technologies, and
  - to promote and, if necessary, to defend multilingualism and multiculturalism, which characterise Europe’s and most of the world’s formation systems.

# Instead of the Conclusion - Where is Croatia?

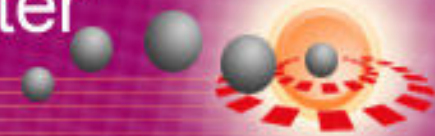


- <http://www.carnet.hr>
- Under CARNet support there are more reference centers designed to give hand in different aspects of e-learning materials applications.



- Development of Educational materials;
  - <http://www.carnet.hr/referalni/obrazovni/en/iom>
- Selection of Hardware and Software in E-education;
  - <http://www.carnet.hr/referalni/obrazovni/en/orpp>
- Teaching Methods and Communication in E-education ;
  - <http://www.carnet.hr/referalni/obrazovni/en/mkod>
- Evaluation of Courseware
  - <http://www.carnet.hr/referalni/obrazovni/en/oca>
- Registration of E-education Projects;
  - <http://www.carnet.hr/referalni/obrazovni/en/ppod>
- Self-assessment and summative assessment in E-education;
  - <http://www.carnet.hr/referalni/obrazovni/en/spzit>
- Development of Multimedia Elements and Their Adaptation to WWW
  - <http://www.carnet.hr/referalni/obrazovni/en/imme>





## Development of Educational Materials

presented:

- a systematic approach to the development and design of hypertextual educational materials-learning objects.
- the knowledge and skills presented in these materials will help to develop quality learning objects as hypertextual materials for different purposes, ranging from personal pages to university textbooks.
- special attention was paid to defining educational materials depending on the available teaching tools, and different aspects of their use were considered in different forms of teaching in higher education.

- From the small country point of view, we could only look for the most suitable standards and accept them.
- Here at our local level we could recommend to adopt one of internationally approved standards and try to organize an educational community.
- Such an approach has a chance to ensure that learning objects developed in Croatia, especially those using the Croatian language will be compatible and could be used as a building block for a e-learning materials.

Thank You on Your  
patience and attention !