

EVENTOS

2004

IV WORKSHOP DE PROYECTOS DIGITALES

LA BIBLIOTECA DIGITAL Y LA INNOVACIÓN
DOCENTE: OBJETOS DE APRENDIZAJE Y
REPOSITARIOS DIGITALES



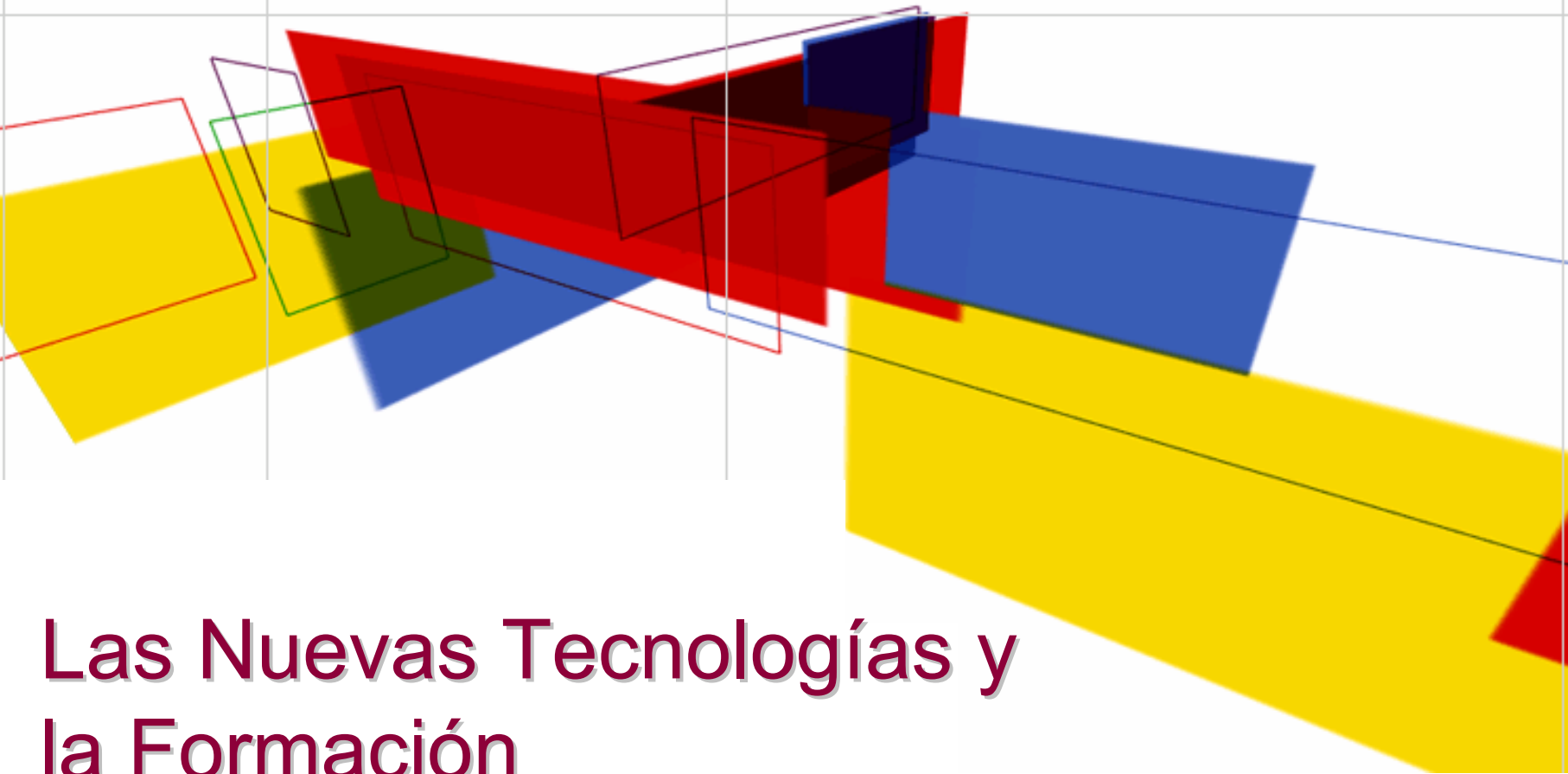
LAS NUEVAS
TECNOLOGÍAS Y LA
FORMACIÓN



crue

Universidades
Españolas

Red de Bibliotecas
REBIUN



Las Nuevas Tecnologías y la Formación

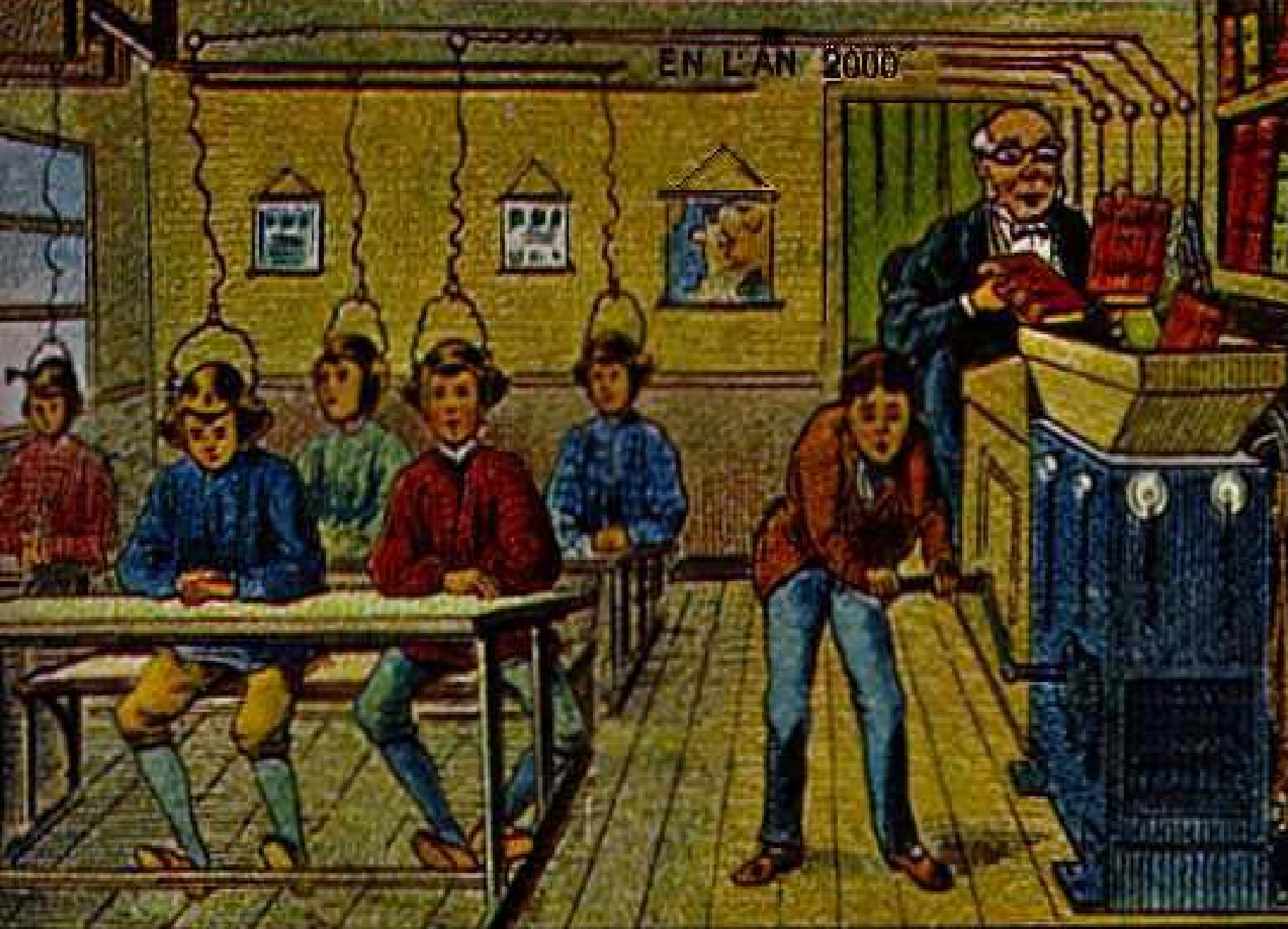
Mercè Gisbert Cervera [mgc@correu.urv.es]
Departamento de Pedagogía
Universitat Rovira i Virgili. Tarragona

Guión:

- Evolución de los modelos de aprendizaje
- El marco de referencia: EEES
- Diseño y desarrollo de materiales formativos
- Gestión del Conocimiento
- Algunas conclusiones



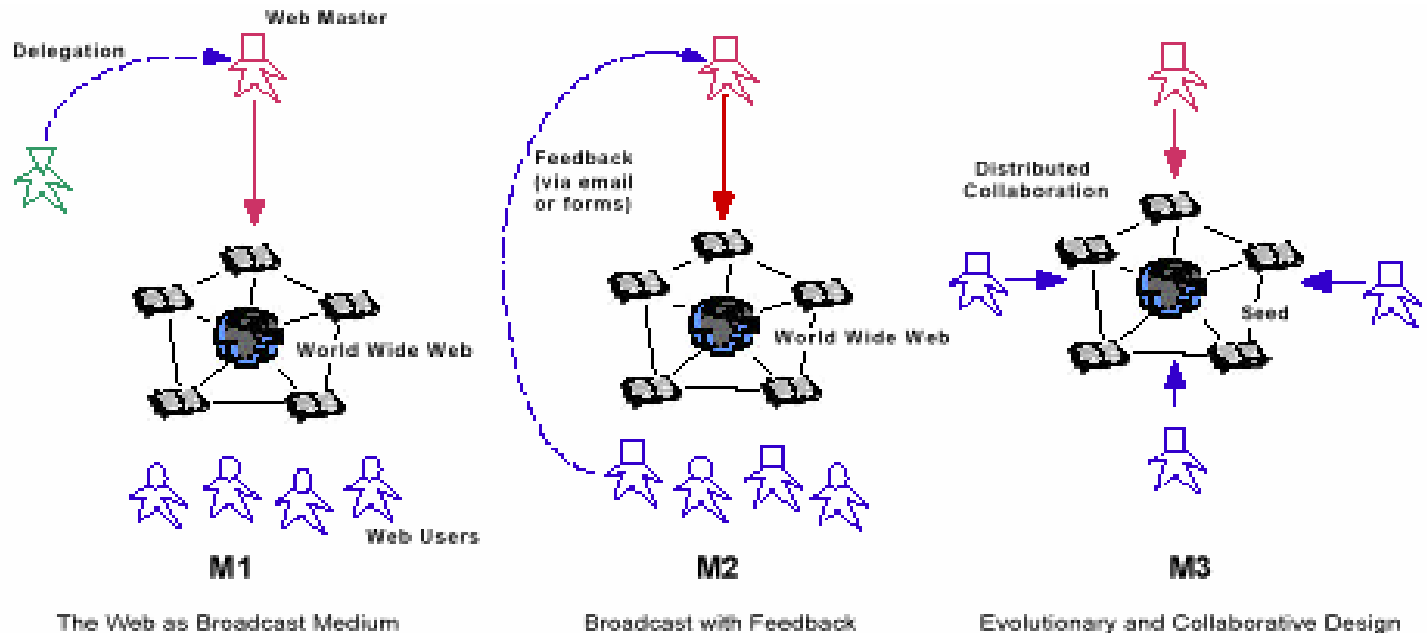
EN L'AN 2000



Evolución de los modelos de aprendizaje

■ Modelos

- Centrados en el profesor
- **Centrados en el alumno**
- Centrados en el grupo: cooperación/colaboración



El marco de referencia EEES

- Elementos básicos:
 - Comunicación (contacto activo)
 - Información (sobre el proceso de aprendizaje)
 - Metodología (cooperación)
 - Temporalización (en función del alumno)
 - Proceso de aprendizaje (centrado en el alumno)
 - Evaluación (adaptada al alumno)
- Las TIC como generadoras de **espacios de formación flexibles y adaptables**

Los ECTS

- Unidad de medida de la actividad del alumno
- *Volumen de trabajo necesario para que el alumno consiga los objetivos formativos especificados en términos de objetivos de aprendizaje y competencias*
- Equivalencia: 25-30h / crèdit
- Cantidad de tiempo empleada por el profesor para enseñar al alumno → cantidad de tiempo requerida por el alumno para conseguir los objetivos formativos

Diseño y desarrollo de Materiales Formativos



Situación actual en el ámbito del e-Learning

- Diversidad de entornos LMS y LCMS: WebCT, ATutor, BlackBoard, Moodle ...
- NO interoperables !
 - Incompatibilidades a diferentes niveles
- Diversidad de contenidos
 - Falta de estrategias comunes para el diseño, desarrollo e implementación de contenidos educativos

Arquitectura abierta para fomentar y facilitar el aprenendizaje on-line



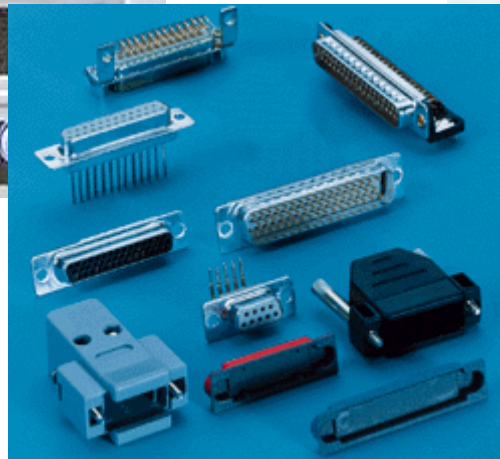


Retos actuales del e-Learning

- **Falta de estándares**
- **Contenidos educativos ligados a la plataforma**
- **Contenidos difícilmente adaptables y actualizables (no reutilizables ...)**
- **Dificultades para la localización de recursos útiles y de calidad) en la red**

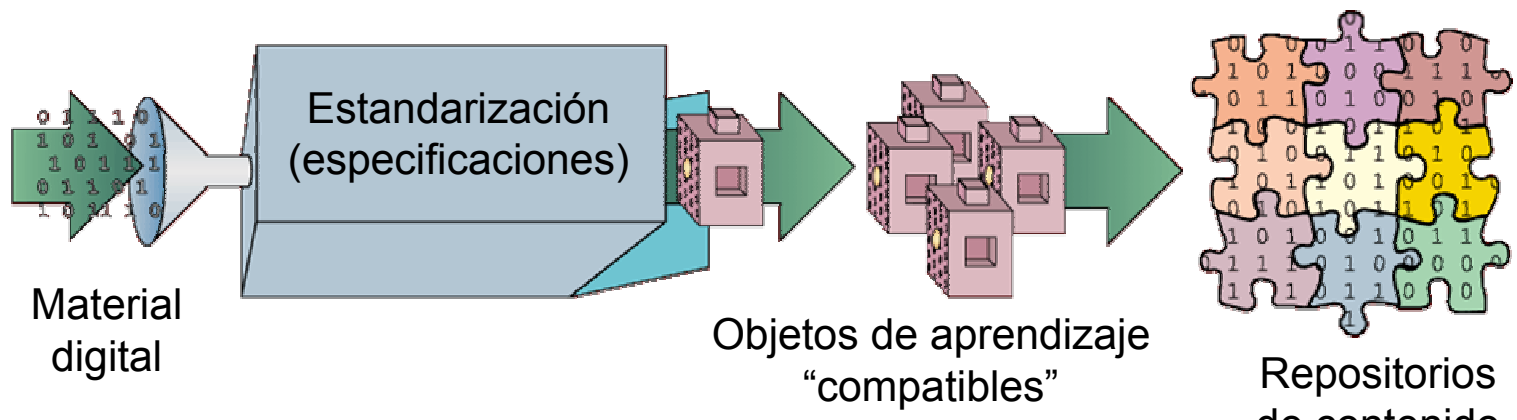
Los estándares

- Continuamente presentes
- Especialmente en ámbitos tecnológicos



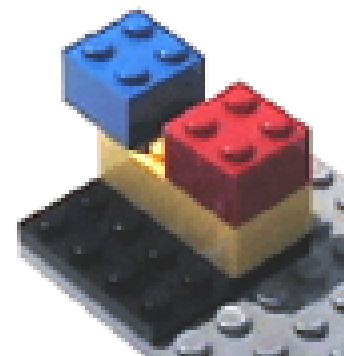
Hacia los “estándares abiertos”

- Estándares cerrados (propietarios)
 - Windows
- Movimiento social:
 - Linux, iniciativas GNU
- Identica situación para el e-Learning



Objetos de Aprendizaje

- ¿Qué es un *Learning Object*?
 - Un fragmento de información digital (convencional) que puede ser usado en un proceso de aprendizaje (Wiley, 2000)
- Características:
 - Reutilizable
 - Identificable (distinguible)
 - Independiente (de otros LO)
 - Etiquetado
 - Propietario (¿coste asociado?)
 - Revisado y evaluado (control de calidad)



Un ejemplo de LO ...

- <http://particleadventure.org>



The Particle Adventure

Home Glossary Table of Contents

What Holds it Together? The Four Interactions

Now we think we have a good idea of what the world is made of: quarks and leptons. So...

What holds it together?

The universe, which we know and love, exists because the fundamental particles interact. These interactions include attractive and repulsive forces, decay, and annihilation.

There are four fundamental interactions between particles, and all forces in the world can be attributed to these four interactions!

That's right: Any force you can think of -- friction, magnetism, gravity, nuclear decay, and so on -- is caused by one of these four fundamental interactions.

What's the difference between a force and an interaction?

Gravity

Electromagnetic

Strong

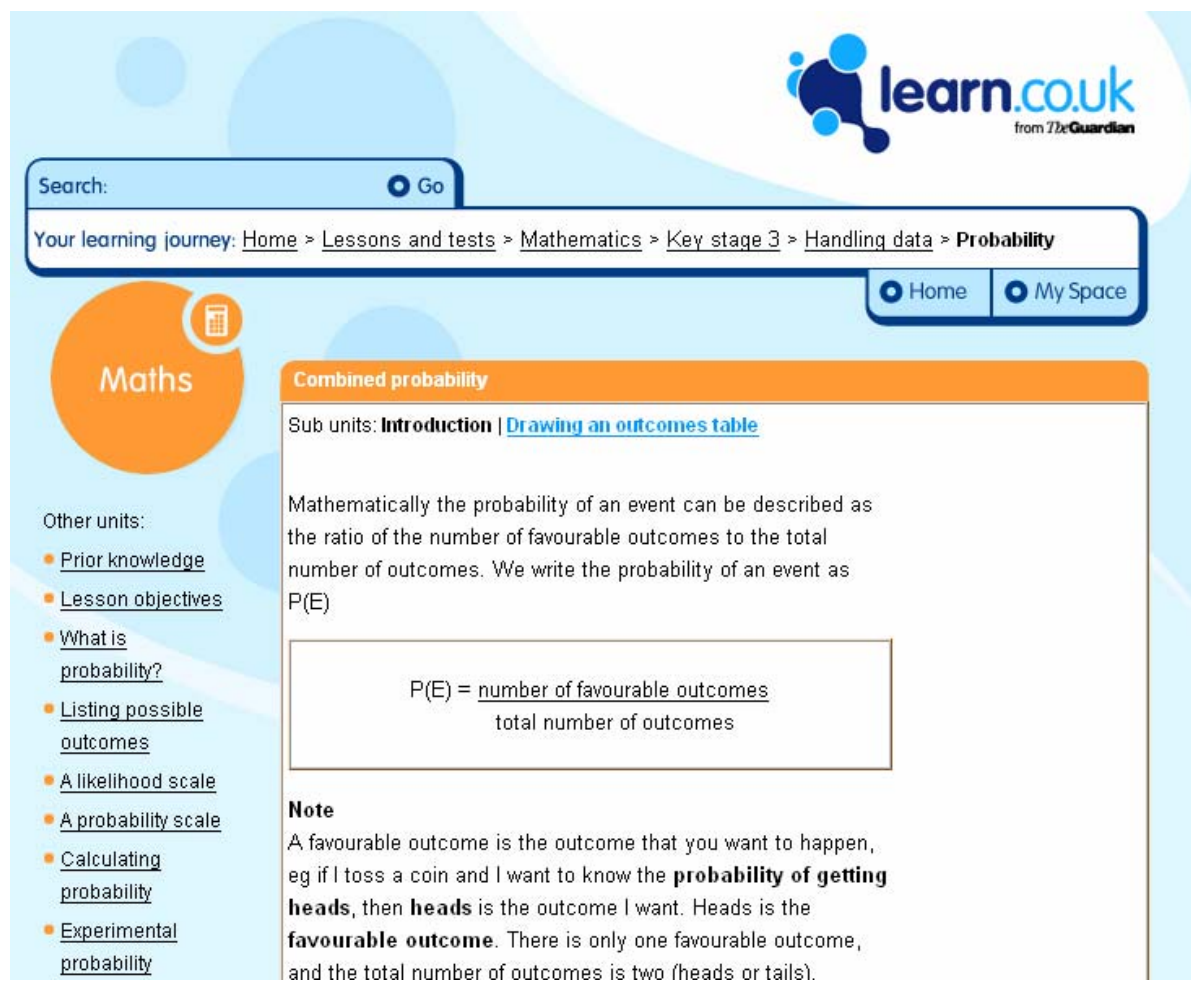
Weak

What is the World Made of? ●
Quarks and Leptons ●
Matter Antimatter ●
What is Antimatter? ●
Quarks ●
The Naming Of Quarks ●
Hadrons, Baryons, Mesons ●
Leptons ●
Lepton Decays ●
Lepton Type Conservation ●
Lepton Decay Quiz ●
Neutrinos ●
Quiz on What Particles Are Made Of ●
The Generations of Matter ●
Matter Summary ●

Listo Internet

Un LO sobre probabilidad

- <http://www.learn.co.uk/default.asp?WCI=Unit&WCU=4583>



The screenshot shows the learn.co.uk website interface. At the top right is the logo for learn.co.uk, with the text "from The Guardian" below it. A search bar is located below the logo, with a "Go" button. Below the search bar is a breadcrumb trail: "Your learning journey: Home > Lessons and tests > Mathematics > Key stage 3 > Handling data > Probability". To the right of the breadcrumb trail are two buttons: "Home" and "My Space". On the left side, there is a large orange circle with the word "Maths" inside, and a smaller orange circle with a calculator icon. Below this is a list of "Other units:" with links to "Prior knowledge", "Lesson objectives", "What is probability?", "Listing possible outcomes", "A likelihood scale", "A probability scale", "Calculating probability", and "Experimental probability". The main content area is titled "Combined probability" and contains the following text: "Sub units: **Introduction** | [Drawing an outcomes table](#)". Below this is a paragraph: "Mathematically the probability of an event can be described as the ratio of the number of favourable outcomes to the total number of outcomes. We write the probability of an event as P(E)". A box contains the formula:
$$P(E) = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$
. Below the box is a "Note" section: "A favourable outcome is the outcome that you want to happen, eg if I toss a coin and I want to know the **probability of getting heads**, then **heads** is the outcome I want. Heads is the **favourable outcome**. There is only one favourable outcome, and the total number of outcomes is two (heads or tails)."

Un ejemplo más complejo ...

- <http://www.shu.edu/projects/real>

IRA: Interactive Real Analysis - Mozilla Firefox

Interactive Real Analysis

- Interactive Real Analysis
 - 0: IRA Overview
 - 1: Sets and Relations
 - 2: Infinity and Induction
 - 3: Sequences of Numbers
 - 4: Series of Numbers
 - 5: Topology
 - 6: Limits, Continuity, and
 - 6.1. Limits
 - Example 6.1.1:
 - Definition 6.1.2:
 - Examples 6.1.3:
 - Definition 6.1.4:
 - Example 6.1.5:
 - Proposition 6.1.6
 - Proposition 6.1.7
 - Definition 6.1.8:
 - Proposition 6.1.9
 - 6.2. Continuous Funct
 - 6.3. Discontinuous Fu

Quick Jump

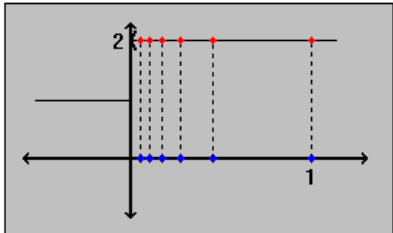
Done

Example 6.1.1:

Consider the function f , where $f(x) = 1$ if $x \leq 0$ and $f(x) = 2$ if $x > 0$.

1. The sequence $\{1/n\}$ converges to 0. What happens to the sequence $\{f(1/n)\}$?
2. The sequence $\{3 + (-1)^n\}$ is divergent. What happens to the sequence $\{f(3 + (-1)^n)\}$?
3. The sequence $\{(-1)^n/n\}$ converges to zero. What happens to the sequence $\{f((-1)^n/n)\}$?

Back



1. For the first sequence, we clearly have that $f(1/n) = 2$ for all n . Hence, the limit of $f(1/n)$ equals 2. So a function applied to a sequence results in a new sequence that can converge to a different number.
2. For the second sequence, we know that $3 + (-1)^n > 0$ for all n . Hence, $f(3 + (-1)^n) = 2$ for all n . This time, a function applied to a divergent sequence results in a convergent one.
3. For the third sequence we know that alternating terms switch signs. Hence, $f((-1)^n/n)$

Etiquetaje de Contenidos

<XML>

<LOM>



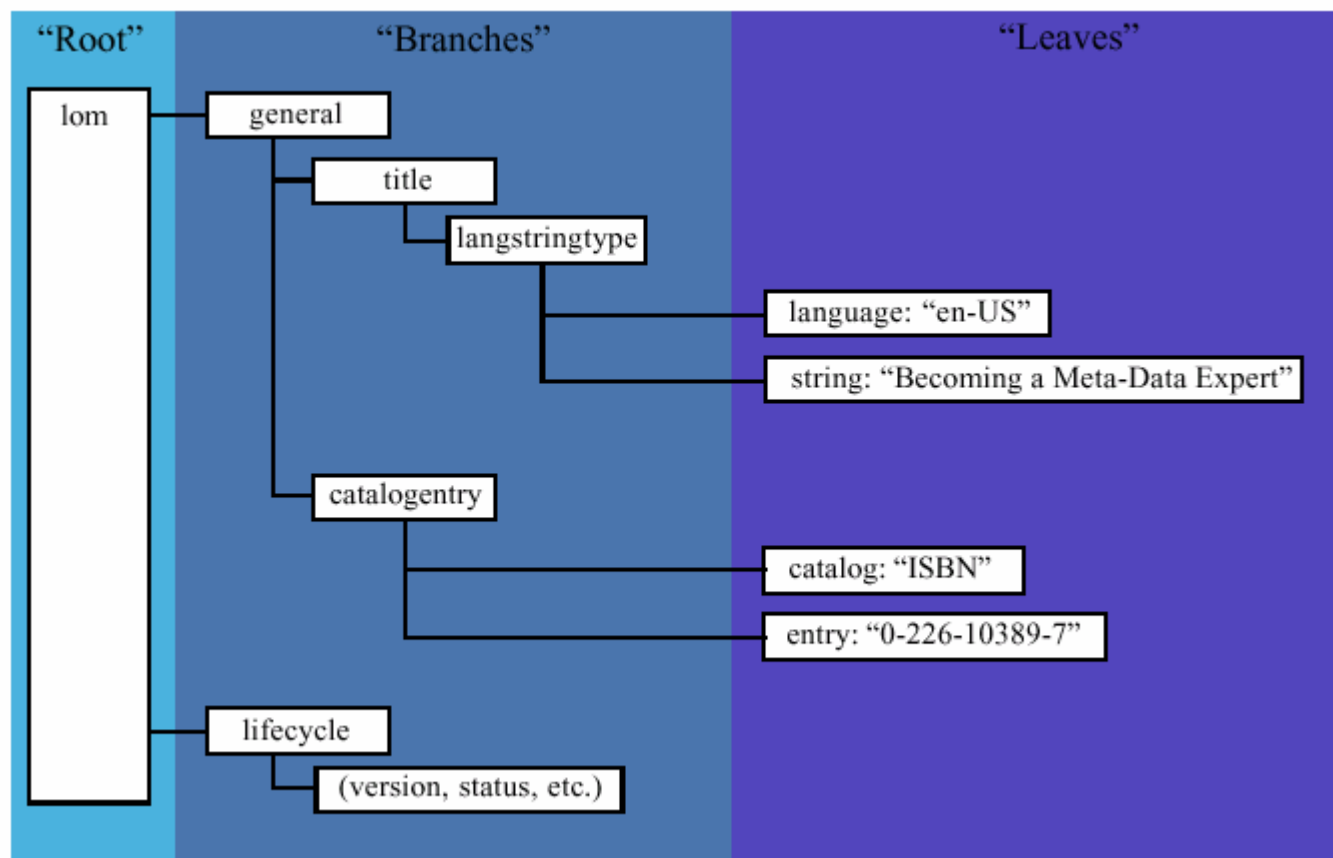
Etiquetado de LOs

- Para localizar fácilmente los objetos de aprendizaje hemos de etiquetarlos
- Disponemos de la especificación IEEE/LOM
- Expresa diversas características que permiten la catalogación de los LO
- ***¿Quién cataloga estos recursos ?***



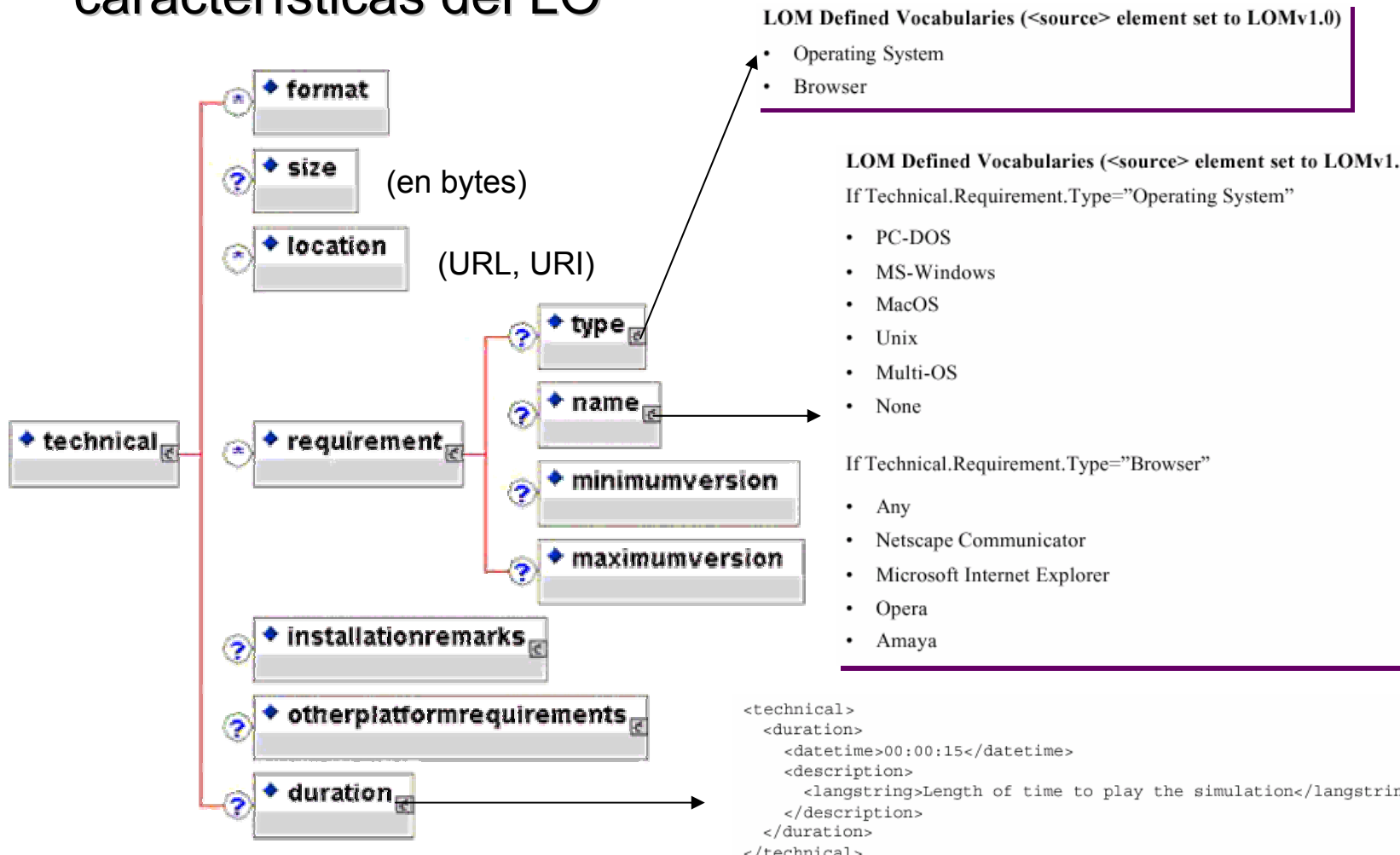
Estructura del árbol LOM

- Representación estructurada de los metadatos LOM según las especificaciones de IMS/IEEE



LOM.technical

- Enumera los requerimientos técnicos y características del LO





LOM.educational

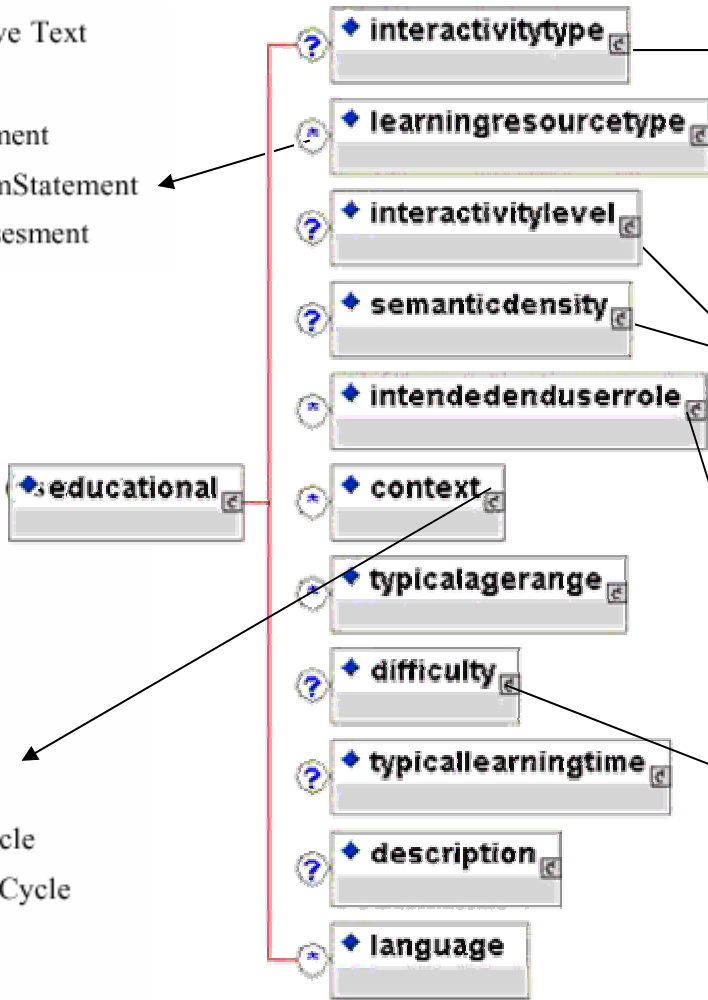
Describe el uso educativo del recurso

LOM Defined Vocabularies

- Exercise
- Simulation
- Questionnaire
- Diagram
- Figure
- Graph
- Index
- Slide
- Table
- Narrative Text
- Exam
- Experiment
- ProblemStatement
- SelfAssesment

LOM Defined Vocabularies

- Primary Education
- Secondary Education
- Higher Education
- University First Cycle
- University Second Cycle
- University Postgrade
- Technical School First Cycle
- Technical School Second Cycle
- Professional Formation
- Continuous Formation



LOM Defined Vocabularies

- Active
- Expositive
- Mixed
- Undefined

LOM Defined Vocabularies

- very low
- low
- medium
- high
- very high

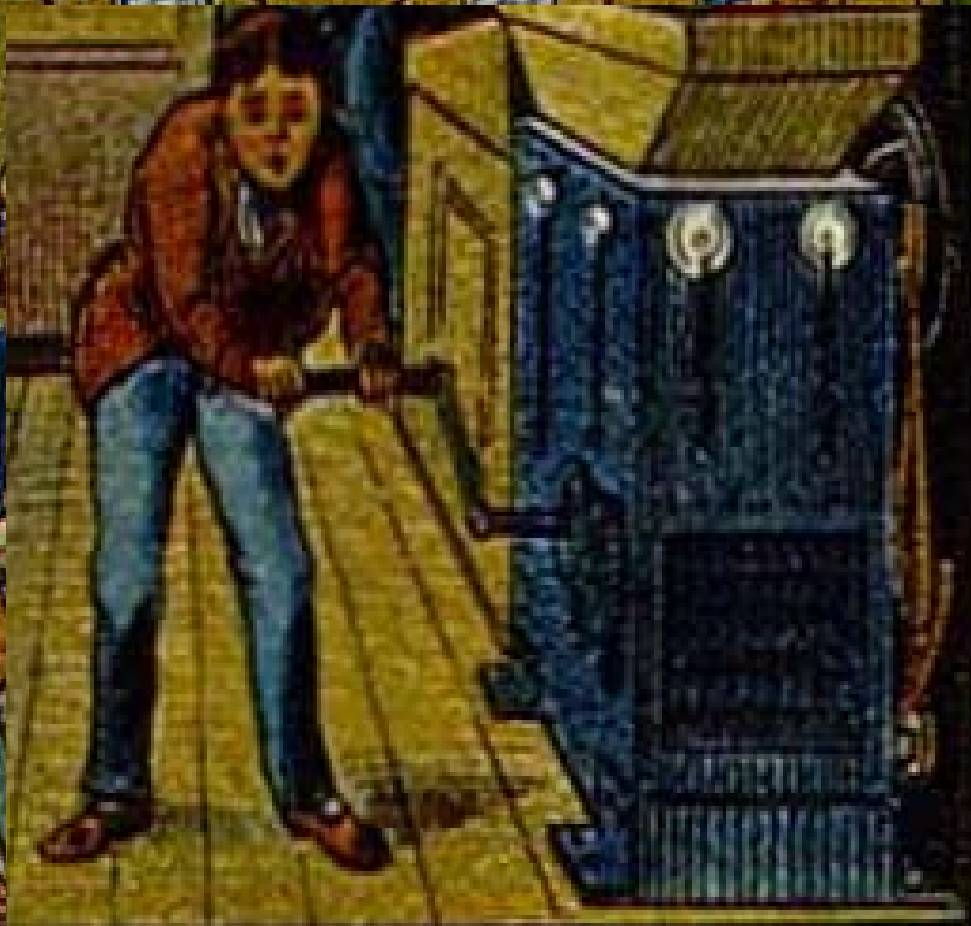
LOM Defined Vocabularies

- Teacher
- Author
- Learner
- Manager

LOM Defined Vocabularies

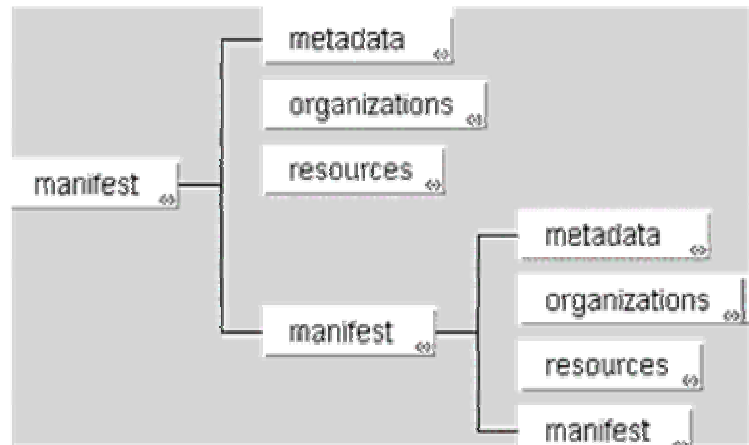
- very easy
- easy
- medium
- difficult

Empaquetado de Contenidos



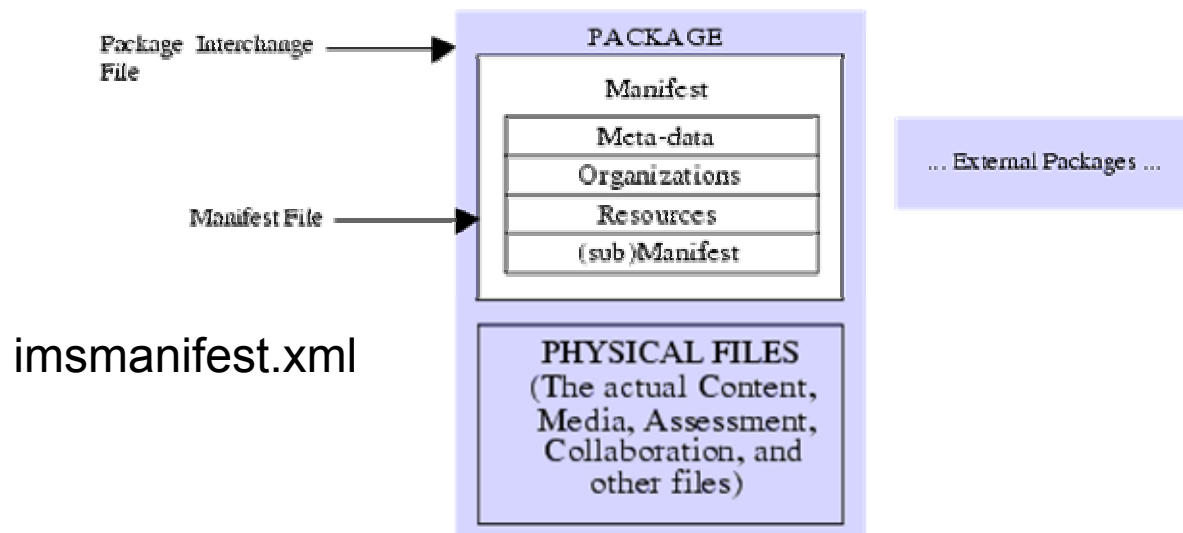
Empaquetado de Contenidos

- El objetivo de esta especificación es permitir el encapsulado de todos los recursos, definiciones de estructura y descripciones asociadas a un contenido educativo
- Un paquete representa una unidad de contenido (re)usable
- El modelo de datos asociado se basa en un conjunto de “manifest files”



IMS-CP. Modelo Conceptual

- Un “package” incorpora
 - Metadatos
 - Organización(s) del contenido
 - Referencias a los recursos utilizados
 - Referencias a otros “packages”
 - Todos los ficheros referenciados

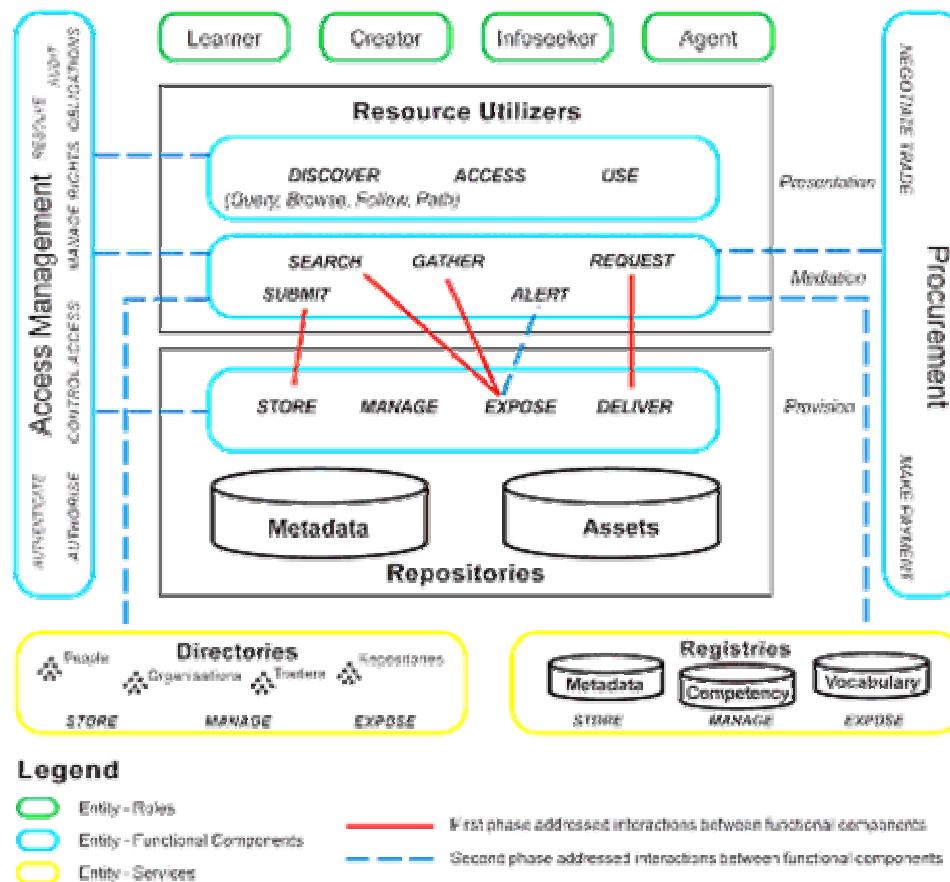


Repositorios de Contenidos



Repositorios Digitales

- Definen recomendaciones para que diversos tipos de repositorios sean interoperables



Apple Learning Interchange

- <http://ali.apple.com>

Teaching Practice

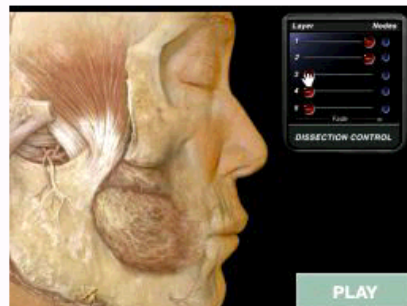
Anatomy Revealed®

THE LESSON

Anatomy Revealed as a Useful Review

In lectures, Anatomy Revealed is a useful and easy way to present anatomy and its clinical relevance. For example, instructors can show a dissection or X-ray of an area that can be correlated with a clinical case. In the laboratory, Anatomy Revealed is an excellent supplement and guide to dissection. Outside of the formal class setting, students can use Anatomy Revealed to review and reinforce their lessons. An additional use of the software is for continuing medical education.

Dissection



Dissections of the human body (cadavers) are presented in a user-friendly interface that permits each layer of anatomy to be "melted-away," revealing relationships between structures found at different depths.

Introduction

The Lesson

Assessment

Student Work

Reflections

Resources

Step Guides

Technology

Background

Provided by:

Medical College of Ohio



School: Medical College of Ohio

Credits:

Authors:

[Roy Schneider, M.S.](#)

Medical Illustrator

Center for Creative Instruction

Gateway to Educational Materials

■ <http://www.thegateway.org>

TheGateway.org
? Help ✉ Contact Us ↑ Home

The Gateway to Educational MaterialsSM

The key to one-stop, any-stop access to high quality lesson plans, curriculum units and other education resources on the Internet!

1. Search by: Full Text and ▼

2. Search by: Full Text ▼

Search by Broad Subject: None Selected ▼

Search by Narrower Subject: None Selected ▼


Select all grades / educational levels that apply:

<input checked="" type="checkbox"/> All	<input type="checkbox"/> Pre-K	<input type="checkbox"/> K	<input type="checkbox"/> 1 st	<input type="checkbox"/> 2 nd	<input type="checkbox"/> 3 rd	<input type="checkbox"/> 4 th	<input type="checkbox"/> 5 th	
	<input type="checkbox"/> 6 th	<input type="checkbox"/> 7 th	<input type="checkbox"/> 8 th	<input type="checkbox"/> 9 th	<input type="checkbox"/> 10 th	<input type="checkbox"/> 11 th	<input type="checkbox"/> 12 th	
	<input type="checkbox"/> Community College				<input type="checkbox"/> Vocational Education			
	<input type="checkbox"/> Higher Education				<input type="checkbox"/> Adult / Continuing Education			

I want ONLY free resources

Search
Clear Form

Copyright 1996-2003 GEM



The Gateway to Educational MaterialsSM Project is sponsored by the
[U.S. Department of Education](http://www.ed.gov)

Wisconsin Online Resource Center

■ <http://www.wisc-online.com>



Wisconsin Online Resource Center

Search objects for:

Search

[Sort objects alphabetically.](#) [Sort objects by date.](#)

Your search returned 11 objects.

- ABE/ESL
- Business
- General Education
- Health
- Professional Development
- Service
- Technical

- About
- Contacts
- Copyright
- Faculty Builders' Resources
- Linking Learning Objects
- Teaching With Learning Objects
- Track Your Learning Object



Technical

Basic Quality Principles: Customers and Suppliers -- Expectations and Satisfaction

Author: [Mary Lee Rudnick-Kaun](#)

School: Fox Valley Technical College Date: 1/28/2002

Description: This learning object covers the basic quality principles of customers, suppliers, customer satisfaction, and customer expectations.

[View this object.](#) [Read reviews](#)



Technical

Basic Quality Principles: Process for Achieving Quality in an Organization

Author: [Mary Lee Rudnick-Kaun](#)

School: Fox Valley Technical College Date: 5/20/2002

Description: This learning object defines and explains the broad steps in achieving quality in an organization.

[View this object.](#) [Read reviews](#)



Technical

Creating Histograms

Author: [Mary Lee Rudnick-Kaun](#)

School: Fox Valley Technical College Date: 9/13/2002

Description: Students follow steps to transfer data from a list to a histogram.

[View this object.](#) [Read reviews](#)



Technical

Quality Basics: Customer Requirements and Specifications

Author: [Mary Lee Rudnick-Kaun](#)

School: Fox Valley Technical College Date: 5/3/2002

Description: This learning object describes customer requirements and specifications as they relate to "Quality" in an organization.

[View this object.](#) [Read reviews](#)

MERLOT

■ <http://merlot.org>



Search Materials:

[advanced search](#) | [search tips](#)

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[Home](#) | [Communities](#) | [Browse Materials](#) | [Contribute Material](#) | [Member Directory](#) | [Help](#)

Browse Materials by Subject

Click on the ► symbol to see sub-categories. Click on the category name to see items in that category.

Browse Path: [All](#) > Education

[General \(111\)](#)

[Library and Information Studies \(95\)](#)

► [TeacherEd \(553\)](#)

► [Teaching Online in Higher Ed \(342\)](#)

Results Path: [All](#) > Education

Your search found 1078 materials

Default sort order by rating. Resort by:

Category: All/Education

Rating

Items 1 - 10 shown.

[Title](#) | [Author](#) | [Date Entered](#) | [Rating](#) | [Item Type](#)

[Research Guide for Doing Undergraduate History](#)

[Peer Reviews](#) (1) avg: ★★★★★

(Reference Material)

Member Comments (none)

Author: Franklin M. Doeringer

Assignments (none)

A website designed to help undergraduates use internet (and printed) resources in researching and...

[Collections](#) (1)

Location:

<http://www.lawrence.edu/dept/history/HistoryResearchGuides.htm>

Added: Sep 27, 2000

CAREO

■ <http://careo.netera.ca>

CAREO
CAMPUS ALBERTA REPOSITORY OF EDUCATIONAL OBJECTS

[Home](#) | Repository contains 3450 objects.

Simple Search: [Advanced Search](#) | [Browse Objects](#)

REPOSITORY LOGIN

User Name

Password

[Forgotten Password?](#)


NON-MEMBERS

> [Create an account](#)

CAREO PROJECT

-
-
-
-
-
-
-

FEATURED OBJECT:



Powers of 10

February 28, 2003: View the Milky Way at 10 million light years from the Earth. Then move through space towards the Earth in successive orders of magnitude until you reach a tall oak tree just outside the buildings of the National High Magnetic Field Laboratory in Tallahassee, Florida. After that, begin to move from the actual size of a

NEWEST OBJECTS:

- Human Brain Anatomy - Flash Drag-and-drop Interaction** : This is a Flash interactive computer model of the cortical (surface) and sub-cortical (internal) components of the human brain. The interactive exercises are targeted towards undergraduate students taking courses that are concerned with the language-related areas of the brain (psycholinguistics, neurolinguistics, language acquisition, neuropsychology, language pathology), and to test their knowledge of brain anatomy.
Owner: UofA Group: guest Permissions: 0744 Created: April 28, 2003
Accesses: 51
- 5th Digit Decision Tree** : This could be used in Health Information Management coding classes.
Owner: pconnell Group: guest Permissions: 0744 Created: April 28, 2003
Accesses: 21
- Interactive 5th Digit Coding Decision Tree** : This interactive Shockwave file simulates a series of logical questions a health information manager may ask themselves when coding for the 5th digit. Upon answering the questions they are given the appropriate code.
Owner: pconnell Group: guest Permissions: 0744 Created: April 28, 2003
Accesses: 8
- 5th Digit Decision Tree** : This could be used in Health Information Management coding classes.
Owner: pconnell Group: guest Permissions: 0744 Created: April 29, 2003
Accesses: 4
- Demo of SMIL Use** : Demonstration of integrating multimedia using the

EEVL

■ <http://www.eevl.ac.uk>



The Internet Guide to Engineering, Mathematics, and Computing

ABOUT SITE MAP CONTACTS SUGGEST A SITE HELP

Discover the Best of the Web

New Titles Available: Printed Technical Magazines Free to Qualified Professionals

SEARCH ALL KEY SITES EEVL CATALOGUE WEBSITES

GO

exact word
 display titles only


search help ?


Any All Phrase


- News
- Top 100
- Recent Advances in Manufacturing (RAM)
- Literature Searching
- Current Awareness
- Events
- Jobs & Recruitment
- Web Tutorials
- Learning & Teaching Subject Centres (LTSN)
- Learning & Teaching Resources
- University Science & Technology Librarians Group (USTLG)
- Resource Finder
- Subject Launch Pad

The EEVL Web site is sponsored by [Adept Scientific](#)

ACCESS SUBJECT AREAS

 **Engineering**
Aerospace & Defence Engineering, Bioengineering, Chemical Engineering...

 **Mathematics**
Algebra, Analysis, Applications, Geometry, Topology, Numerical Analysis, Probability...

 **Computing**
Computer Applications, Computer Systems Organisation, Computing Methodologies...







<http://ants.etse.urv.es/planetdr>

PLANET Digital Repository

Last Updated: 15 July 2004

Information

Educational Contents
DRI
ECL
EduSource
Authors
Collaborators

Quick Search

java
Type: All
Server: URV
(Type only allowed over PlanetDR repositories)
Search

Extended Search

Search by category
Accumulated Search

Upload

Add Educational Content
Uploaded user contents

Registered User mode

Done

Summary

The URV Educational Content Repository on the repositories interoperability with the content repositories that implement

The ECL functions implemented by them. There are different types of search, associated meta-data the wished where any field of a LOM meta-data make search on any field, linking together provided by the URV, or the web server federated search, (a simulated gathering)

In the future we plan to create a dedicated. It will be based on related projects such as

Links

- ♦ [Universitat Rovira i Virgili](#)
[School of Engineering](#)
[Computer Science and Mathematics](#)



Quick Search

java
Type: All
Server: URV
(Type only allowed over PlanetDR repositories)
Search

Extended Search

Search by category
Accumulated Search

Upload

Add Educational Content
Uploaded user contents

Registered User mode

Done



Educational Content search by General category

Title:	<input type="text"/>
Language:	<input type="text"/>
Structure:	<input type="text"/>
Coverage:	<input type="text"/>
Aggregation level:	<input type="text"/>
Keyword:	<input type="text" value="java"/>
Catalog:	<input type="text"/>
Catalog Entry:	<input type="text"/>
Logical operator:	AND <input type="button" value="v"/>
Server:	URV <input type="button" value="v"/>
Type (Only URV):	<input type="button" value="v"/> URV EXPLORA POND CAREO All

[Back](#)



Selected content number 1

Server which owns the content: EXPLORA

Title (en): Java for C and/or C++ Programmers**Description (en):** This online course instructs C and C++ programmers to become proficient in Java programming. Instruction covers creating applets and applications and understanding Java object-oriented programming, as well as presents interesting laboratory assignments using a variety of Java features, including graphics, sound, animation, GUI components, GUI event (...)[Show metadata](#)

Download not allowed for this content.

Title (en): Java for C and/or C++ Progr**Description (en):** This online course in and understanding Java object-orientec animation, GUI components, GUI event**Title (en):** Java Server Programming ar**Description (en):** Students will learn hc will look at integrating the business lay Java//u0027s cross-platform ability (...)

Complete metadata information of the educational content

General category

Title (en): Java for C and/or C++ Programmers**Language:** English**Description (en):**

This online course instructs C and C++ programmers to become proficient in Java programming. Instruction covers creating applets and applications and understanding Java object-oriented programming, as well as presents interesting laboratory assignments using a variety of Java features, including graphics, sound, animation, GUI components, GUI event handling, multithreading, and networking. Topics include Java-enabled World Wide Web browsing, Java Development Kit (JDK) and the Java programming environment (compiler, interpreter, appletviewer, debugger), Java virtual machine, Java Applications Programming Interface (API), Hypertext Markup Language (HTML), Javascript and CGI scripts, Java Foundations Classes (JFC), security issues, and many others

Identifier (catalog): (POND):**Identifier (entry):** luiE5838C8F5686408598CE9C133194DDF3

MetametaDada category

Language:x-none**Contribute (1):**

Role (source):

Role (value):

DateTime: 2004-02-04

DateTime Description:

Vcard:

Information

Educational Contents
 DRI
 ECL
 EduSource
 Authors
 Collaborators

Quick Search

Type:

All

Server: URV

(Type only allowed over PlanetDR repositories)

Extended Search

[Search by category](#)
[Accumulated Search](#)

Upload

[Add Educational Content](#)
[Uploaded user contents](#)

Registered User mode

Wellcome Robert!
[Change the login](#)
[Change the password](#)
[LogOut](#)

Upload of Educational Content

Step 2 : Information of the Educational Content

Metadata XML File Name:

Content type:

Programming

Privacy:

Allow downloads Deny downloads

[Back](#)

Integración con los Entornos de Gestión de Contenidos (LMS)



El Modelo de Referencia: SCORM

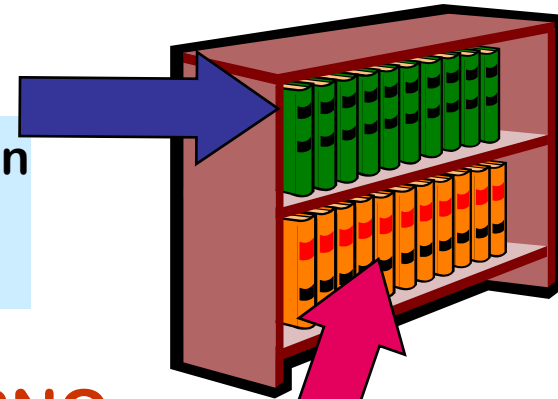
MODELO DE AGREGACIÓN



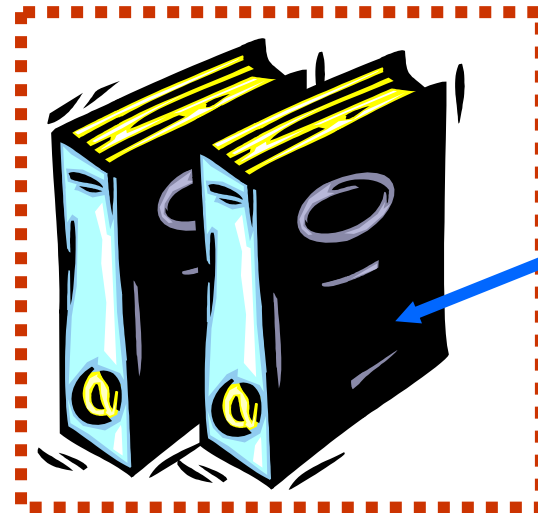
Formato de Estructura del curso (AICC)

Metadatos (IEEE-LOM)

Representación LOM en XML (IMS)



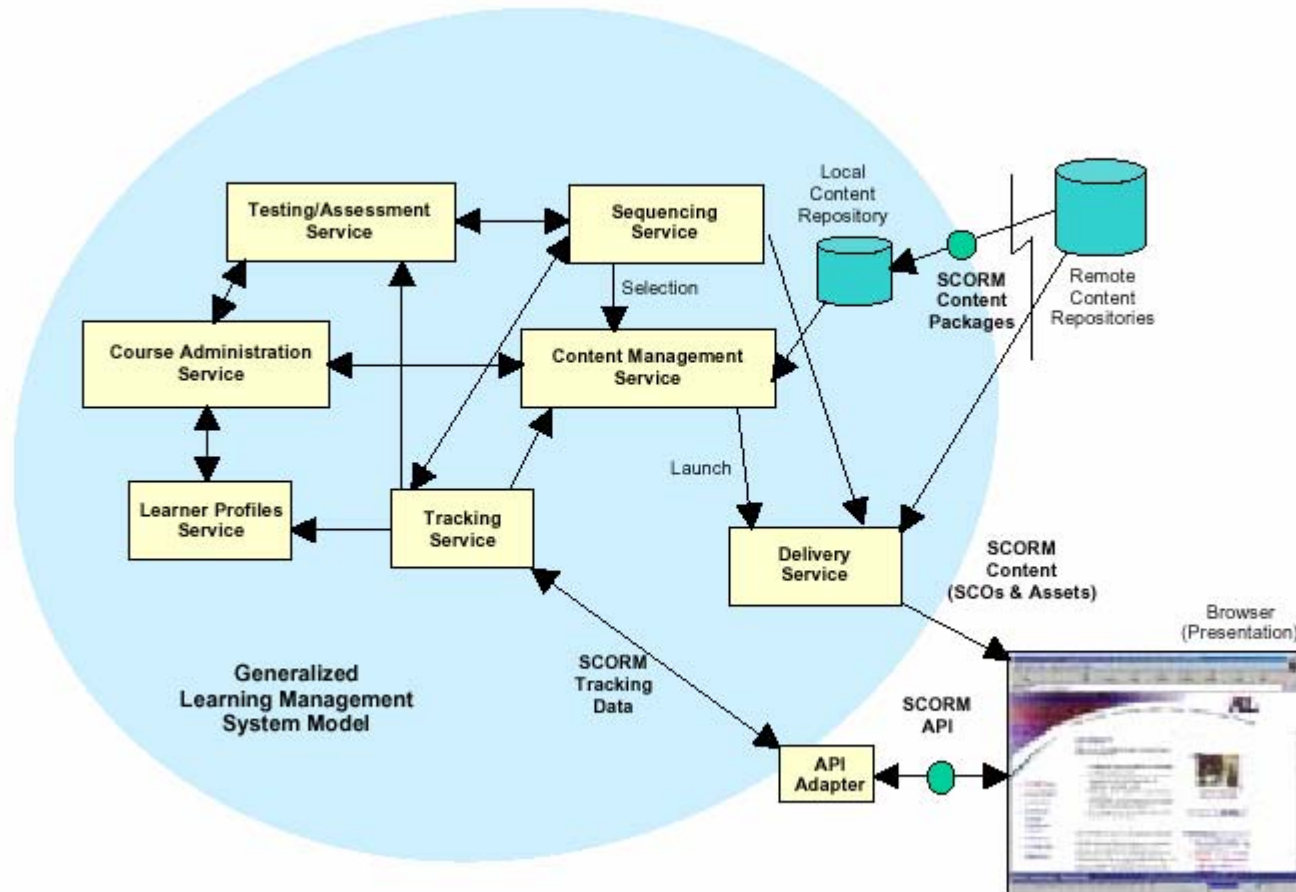
ENTORNO DE EJECUCIÓN



Contenido LMS API (AICC)

LMS i SCORM

- SCORM no especifica el funcionamiento interno del LMS



Moodle

■ LMS de dominio público

Moodle Features Demo You are logged in as **Demo Teacher** (Logout)

Moodle » Features

This course outlines Moodle's features by providing examples of all the sorts of activities and types of content that Moodle offers in an easy-to-browse form. It's very new and still under development.

Topic outline

- General features
 - Overall design of Moodle
 - Site management
 - User management
 - Course management

Online Users

(last 5 minutes)

Demo Teacher

People

- Participants
- Edit profile

- 1 Text filters - these features can be applied to all text throughout a Moodle site
 - Auto-linking
 - Mathematics notation
 - Media plugins
 - Multi-language content

Calendar

<< June 2004 >>

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

■ Global events
 ■ Course events
 ■ User events

Activities

- Assignments
- Chats
- Choices
- Forums
- Glossaries
- Journals
- Lessons
- Quizzes

- 2 Assignments
 - An "Upload File" assignment
 - An "Offline" assignment
- 3 Chats
 - A "Repeating" chat with public session logs

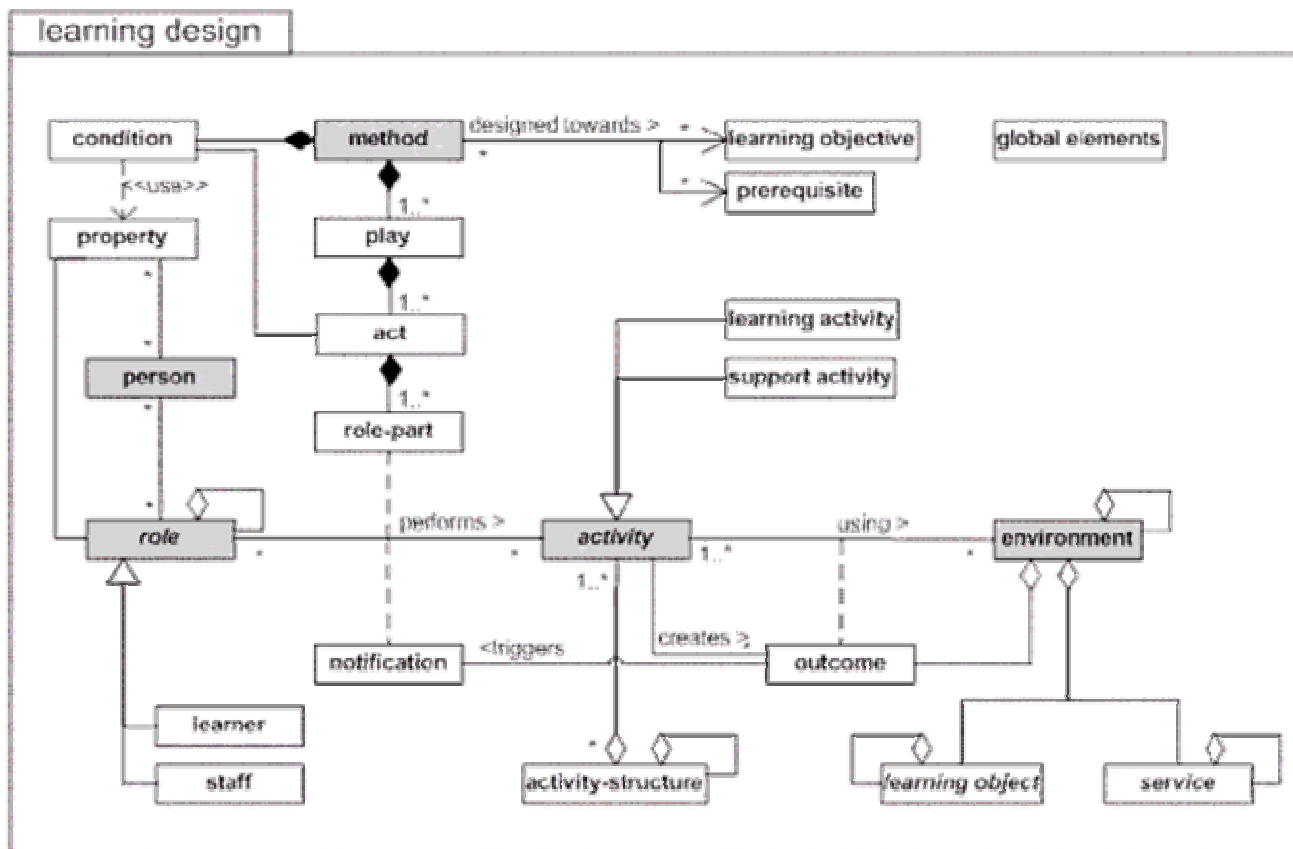
Upcoming Events

- this is a new event**
Today (12:00)
- office hours**
Today (12:00)
- A "Repeating" chat with**

Done

Diseño del Aprendizaje

- Especificación que permite definir modelos de aprendizaje



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- Comparative Media Studies **NEW**
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- Economics
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- Engineering Systems Division
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LAUNCH

ENHANCE

September 2002

MIT OCW pilot

September 2003

Official launch with

September 2007

Virtually all of MIT's courses



Conclusiones

- El EEES implica flexibilizar el proceso de E-A
- Evolución hacia modelos semipresenciales
- Uso intensivo de las TIC
- Actualmente disponemos de:
 - Estándares para la reutilización de contenidos
 - Repositorios de contenidos
 - Herramientas de desarrollo de dominio público

EN L'AN 2000

