

# **Serendipity** a platform to discover and visualize Open OER Data from OpenCourseWare repositories

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Theme: “Open Education for a Multicultural World”

UPM GICAC Research Group



# Agenda

- The context
- Linked Open OER Data Exploitation
- Services that support the model
  - Serendipity, search of engine
  - Serendipity, maps

# I. The context

- In the last years, the amount of Open Educational Resources (OER) on the Web has **increased dramatically**.
- The **potential of this vast amount of resources is enormous** but in **most cases it is very difficult and cumbersome** for users (teachers, students and self-learners) to visualize, explore and use this resources,
- Semantic Web technologies and, more precisely, Linked Data are **changing the way information is stored and exploited, and they create bridges**

Linked Data—particularly data available using open licenses—has an important role to play in information systems and could be a key feature for Open Education based on OER data on the Web of Data.

## **II. LINKED OCW/OER DATA EXPLOITATION MODEL**

## II. Linked OCW/OER Data Exploitation Model

The generation and use of linked data from heterogeneous open access sources will create new opportunities for OER and OCW initiatives.

The exploitation model pipeline is organized in four stages

### 1. RDF data generation:

- The collection under study consisted of approximately 8,000 OCWs and 100,000 OERs in the collection of the OCW-Dataset of LOCWD Project.



### 2. Analytical approach:

- Technically, at this stage is important define SPARQL statements to extract the data which contain the information required for each application. The applications to visualize, explore and use OCW/OER data are generated depending on the data extraction and visual configuration.



### 3. Visual abstraction

- The purpose of this stage is to condense the data into a displayable way for particular application (information that is visualizable on the end-user application). Because the linked data on the Web are accessible via services or public query libraries, OCW/OER data can be processed, reused, combined, integrated, and used for several purposes.

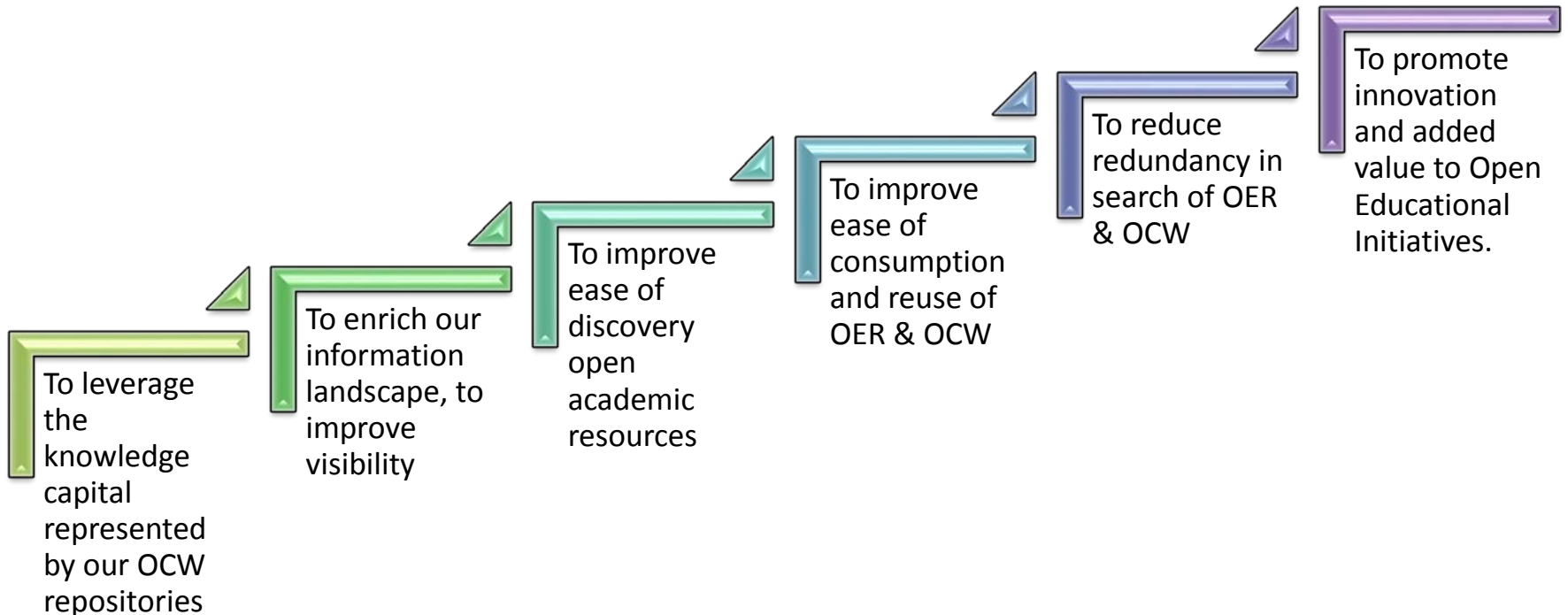


### 4. Visual representation:

- The purpose is connect LOCWD dataset with visual tools to consume and display linked OER/OCW data. This stage processes the visualization abstractions in order to obtain a visual representation of end-user applications. In this stage, the result of the process is presented to the user, e.g. faceted search, data visualizations: plot, treemap, map, timeline, etc.

# The power of Linked Open Educational Resources Data

The domain of OER and OCW resources described as Linked OpenCourseWare Data holds the potential to move OER and OCW collections out of their silos and therefore **opening the data**:



## **III. SERVICES SUPPORTED BY THE MODEL**

# III. Services

- Two services to explore and interact with the LOCWD data through different ways:
  - (a) **Serendipity a faceted search engine** (<http://serendipity.utpl.edu.ec/>), and
  - (b) **Serendipity Maps** (<http://serendipity.utpl.edu.ec/map>), a service of OER data visualizations.
- These applications allow users to obtain an overview of RDF datasets from OCW and OER



In Serendipity, facets correspond to properties of the OpenCourseWare content. The data are derived by analysis of the text of an item using entity extraction techniques or from pre-existing fields in a database such as author, descriptor, language, and format.

## **CASE 1. SERENDIPITY, A FACETED SEARCH FOR OER AND OCW RESOURCES**

# Context

- Search is among the most disruptive and innovative technology of the Internet. OER search is not a solved problem.
- **Facet browser interfaces provide a convenient and user-friendly way to navigate** through a wide range of Open Educational Resources Data collections:
  - To support flexible navigation through the information space
  - To refine providing suggestions of exploration, choices at each point in the search process.

# Needs of stakeholders

- Users:
  - to filter content using multiple category or taxonomy terms at the same time. Users want to combine text searches, category term filtering, and other search criteria.
  - Self-learners don't know precisely what they can find on OCW site, or what to search for. Self-learners are trying to discover relationships or trends between OER & OCW.
- OCW providers:
  - To improve limitations of their own searching tools: users often get empty result sets when searching your site.

# Serendipity a Faceted Search for OpenCourseWare Content

- (<http://serendipity.utpl.edu.ec/>)
- This service enables the faceted exploration of OER related to OCW in an OpenCourseWare search engine.
- Moving towards a Web of Linked Data, Serendipity provides a service to explore refining by facets large OCW and OER collections.

Q semantic Refine search New search

264 results found in 104 ms.

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## Categories

- Resources Types (2)
- Topics (8)
  - Electrical Engineering and C... (69)
  - Brain and Cognitive Sciences (62)
  - Linguistics and Philosophy (39)
  - Biological Engineering (28)
  - Ingeniería Telemática (23)
  - Computer Science (18)
  - Media Arts and Sciences (18)
  - Management (4)

- Tags (20)
- Universities (3)
- Authors (25)
- Languages (2)
- Licenses (1)
- Plataforms (2)
- Consortiums (2)

## Geo

- North America (239)
- Europe (24)

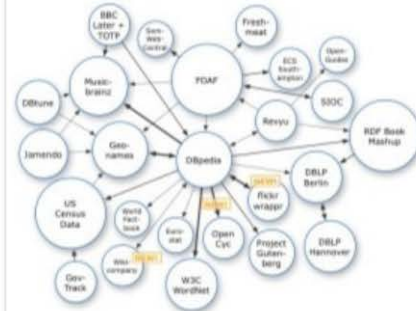
## Ontologies and Semantic Web

OCW

More OCW like this |

Published by: Universidad Politécnica de Madrid | Language: Spanish

Share in:



The general objective is to provide students with a sound grounding of scientific, methodological and technological fundamentals in

## Ontology, Semantic Web and Electronic Government

OCW

More OCW like this |

Published by: United Nations University | Language: English

Share in:

### Course image

This course is an introduction to ontology, semantic web and electronic government (e-government). This course aims to provide basic understanding of technologies supporting e-governance. It examines Ontologies and the Semantic Web in the context of electronic governance. It also presents some case studies in electronic government.

### Author(s):

- Adegboyega Ojo, Ph.D.

### Tag(s):

international institute for software technology

Exploring OCW in an integrated and incremental way, from any of the repositories of institutions that publish OER and OCWs.

# Serendipity – expanding the original query

- DISCOVER: The user, when presented with the facets, is likely to discover new facets of the query that they were not aware of before.
- REFINE: When clicking on a facet, they will narrow down their search by expanding the original query with the suggested facet.
- BETTER RESULTS: more accurate and complete results, since it locates OERs using different metadata and data elements.

The screenshot shows a web browser window with the URL `serendipity.utpl.edu.ec`. The page title is "Serendipity" and the search bar contains the text "Semantic". Below the search bar, there is a navigation menu with items like "Spanish Gen. 1", "YouTube", "Hyperconnect", "Avilgadores", "Cifras y Conceptos", "+Nelson", "El Umbra", and "McCAMMON".

The main content area displays the search results for "Ontologies and Semantic Web". At the top, it says "Did you mean semantic? 1 results found in 31 ms." and "Page 1 of 1". The title of the result is "Ontologies and Semantic Web" with the OCW logo. Below the title is a "Course description" section with a "Like" button and a "Share" button. A network diagram is shown, consisting of various nodes connected by lines, representing a semantic web or ontology. Below the diagram, it says "Published by: Universidad Politécnica de Madrid | Language: Spanish" and "Source: <http://ocw.upm.es/tema-de-la-computacion-e-inteligencia-artificial/ontologies-and-semantic-web>".

There is a "Ranking" section with a star rating and a "Like" button. Below that is a "Write your tags" section with a text input field and a "Save tags" button. The main text of the course description reads: "The general objective is to provide students with a sound grounding of scientific, methodological and technological fundamentals in Ontological Engineering and the Semantic Web areas. This knowledge will be later used to build applications that can integrate, semantically and infer heterogeneous and distributed information."

The "Author(s)" section lists: Oscar Cosch; Aurora Pérez; and Guadalupe Agudo de Cea. The "Tag(s)" section shows: "Gestión de la computación e Inteligencia Artificial", "ontología", and "web semántica". The "Topic(s)" section shows: "Gestión de la Computación e Inteligencia Artificial". The "Language" is Spanish and the "License" is Creative Commons Attribution-NonCommercial-ShareAlike 2.0.

At the bottom, there are sections for "Information about publisher" and "Related OER". The footer shows "1 results found." and "Page 1 of 1".

- On the right-hand side the traditional image search results are shown.
- On the left-hand side there is the list of facets for OCW and OER resources. In this case, a list of prominent resources in Serendipity is displayed

Accessing to a particular course. The first section contains general data about the selected course.

The screenshot shows a web browser window with the URL `serendipity.utpl.edu.ec`. The search bar contains the text "Semantic". Below the search bar, there is a suggestion: "Did you mean semantica? 1 results found in 31 ms." The main content area displays the search results for "Ontologies and Semantic Web". The results are grouped by facet, showing "Course description" and "Information about publisher". The publisher information includes the logo of the Universidad Politécnica de Madrid, the tagline "Ingeniamos el futuro", and the address: "Universidad Politécnica de Madrid, Av Ramiro de Maeztu, 7, 28040 Madrid, Spain". A map of Madrid is also visible. The footer of the page indicates "Develop by loxa.ec, powered by j4loxa.com".

Serendipity demonstrates following key features: grouping search results by facet; displaying a total number of OER & OCW per facet value, refining search results by facet value, update of the facet menu based on refined search criteria, displaying of the search criteria in a Bread Crumbs (navigation guides), ability to exclude the chosen facet from the search criteria, ability to improve ease of discovery open academic resources, ability to improve ease of consumption and reuse of OER & OCW, and ability to reduce redundancy in search of OER & OCW.

Accessing to a particular course. The second section contains information about publisher.



**Related OER**

**Open Educational Resources**

Open Educational Resources (OER) are freely accessible learning, educational, assessment and research resources.

**Benefits:**

- Accessible - In terms of being free of restrictions usable for people with disabilities.
- Minimal cost - Not only are resources cost-free software or resources.
- Reusable and adaptable - The copyright exceptions allow access or reuse, and very often the resources can be modified.

[POLITICA\\_OA\\_UPM.pdf](#) ⓘ

**contents , 2008**

- [OWS-07-Methodologies-Concept-REEng.pdf](#) ⓘ
- [OWS-08-methodologies-Espec-OL.pdf](#) ⓘ
- [OWS-Ontologies-Multilinguality.pdf](#) ⓘ
- [ows\\_-\\_01\\_-\\_intro-sweb.pdf](#) ⓘ
- [OWS\\_-\\_02\\_-\\_Ontologias.pdf](#) ⓘ
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**OWS-07-Methodologies-Concept-REEng.pdf** x

**Author:** Simon

**Number of pages:** 63

**Size:** 927359 bytes.

**Created date:** 07-12-13 6:08:34

**Modification date:** 07-12-13 6:09:15

**Ranking:** ☆☆☆☆☆ 0 votes, 0.00 avg. rating

**Like:** 👍 0 likes | 0 dislikes

**Write your tags:**

add a tag

Save tags

Close

Accessing to a particular course. The third section provides access to OERs from the selected course

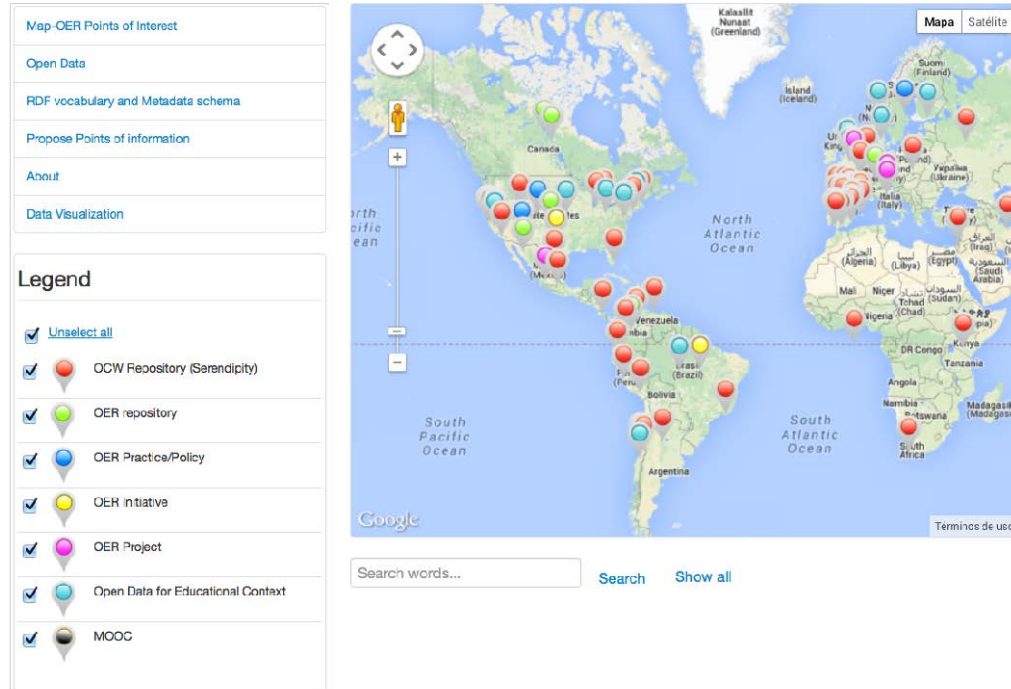
## CASE 2. SERENDIPITY DATA VISUALIZATION

# Context

- <http://serendipity.utpl.edu.ec/map/>
- OVERVIEW OF DATASETS: Visualization techniques to the OER and OCW data to explore large amounts of data and interact with them: an overview of the datasets, their main types, properties and the relationships between them.
- UNFORESEEN DATA: unique opportunity on the Open OER Data environment generated by LOCWD and Serendipity.
- We generate data structures automatically from reused vocabularies or semantic representations. This will enable users to explore datasets even if the publisher of the data does not provide any exploration or visualization means.

Serendipity is a faceted search engine based on Semantic Web Technologies. As an important feature of Serendipity, Serendipity POIs (Points of Interest), allows users visualize OCW Repositories from a dataset based on Linked Data technologies.

Serendipity is sponsored by the research group GICAC from the Universidad Politécnica de Madrid (GICAC-UPM) and the Universidad Técnica Particular de Loja (UTPL) in collaboration with the OCW Institutions. This project aims to improve the searchability and discoverability of open educational content, which will enhance the ability for learners and educators to find and use OCW courses.



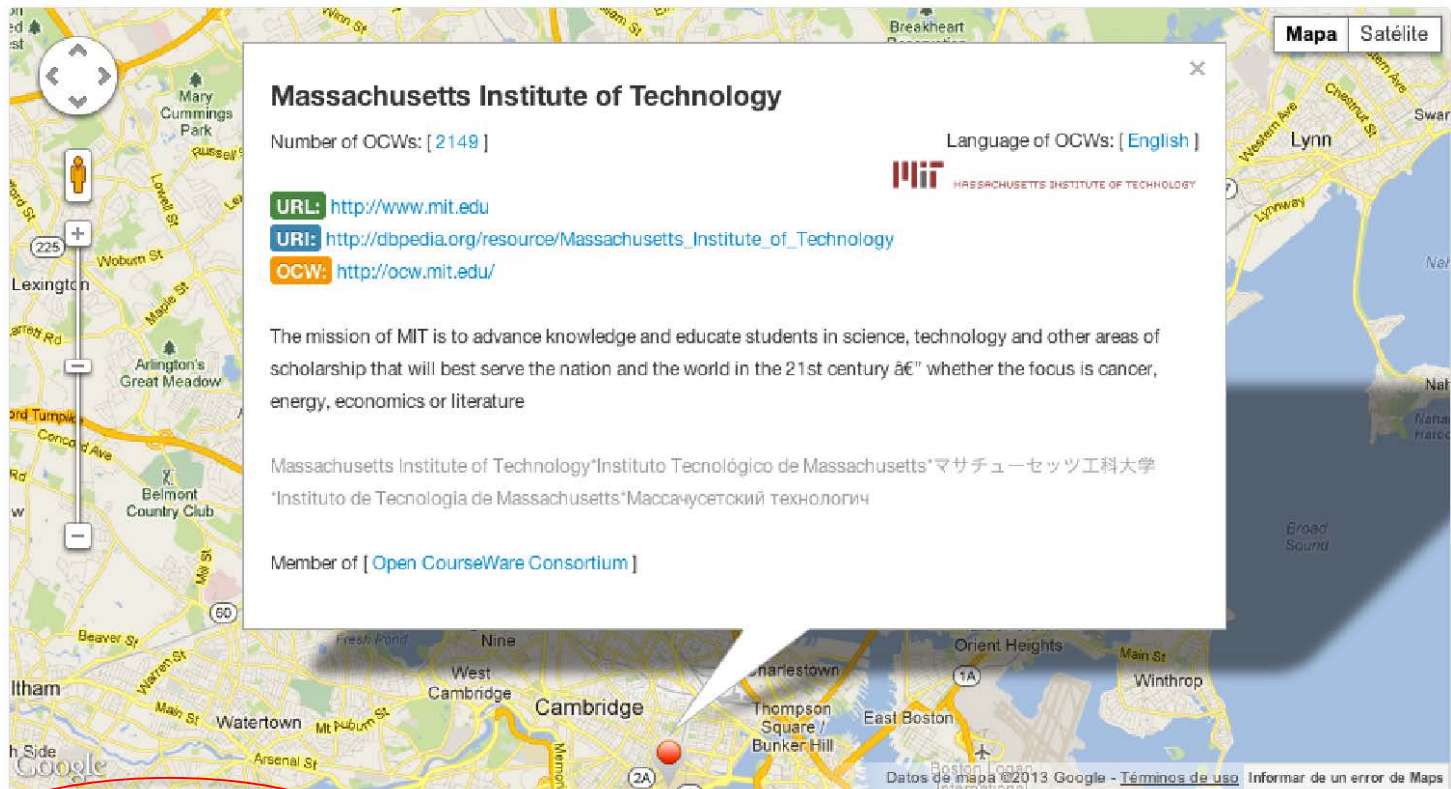
As an important feature of Serendipity, Serendipity MAPs is a data visualization of OERs that allows users visualize data of OCW / OER / MOOC / OEP / OA Projects / OA Repositories from a dataset based on Linked Data technologies show Points of Interest, POIs).

OER Data Visualization: Map of Open Educational Repositories distributed in the world and described on LOCWD

# Serendipity Maps

- Serendipity Maps use icons to represent different categories of data on a map graphically. For example, a point of interest, or POI, is an OER specific point location that someone may find useful or interesting. A description for the POI is usually included, and other information such as description, number of resources, contact information, language, license or a link to dbpedia/freebase may also be attached.

A point of interest specifies, at minimum, the latitude and longitude of the POI, assuming a certain map datum (extracted from dbpedia datasource). An example is a point on the Earth representing the location of the Massachusetts Institute of Technology, or a point on Spain representing the location of an OCW University



An example de Serendipity POI



Tags starts with:



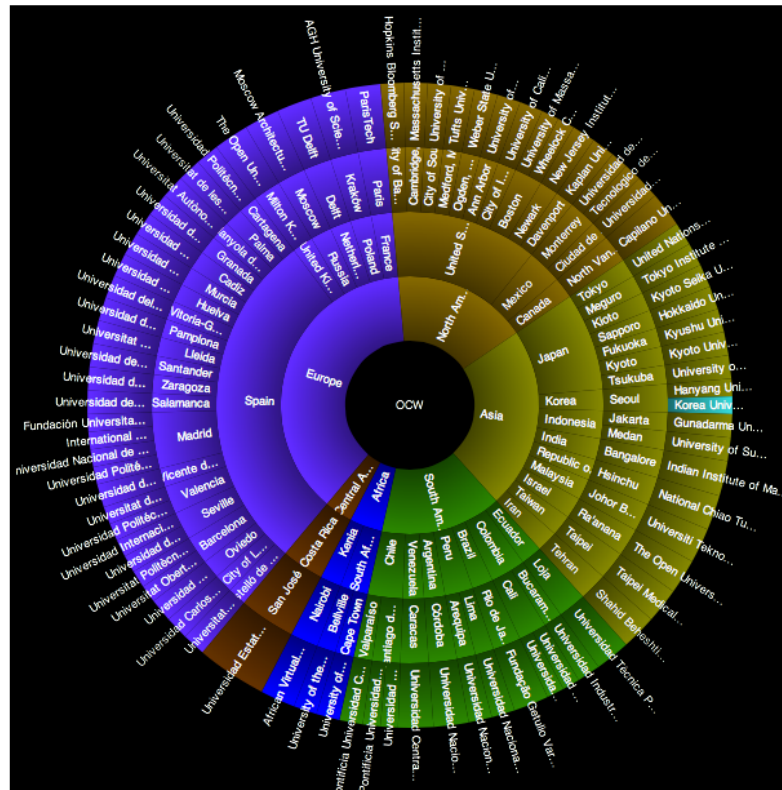
Recommended tags\*



Geo Data Visualization of resources by tag

**Serendipity** - Open data contains valuable information that will drive insights, innovations, and discoveries, but it can be difficult to access and digest. Using data visualization, we're simplify the complexity and drive a deeper understanding of the open educational context.

Map-OER Points of Interest
Open Data
RDF vocabulary and Metadata schema
Propose Points of information
Data visualization
About



### Korea University



Number of courses: 99

Language of OCWs: [ Korean ]

URL: <http://www.korea.edu/>

URI: [http://dbpedia.org/resource/Korea\\_University](http://dbpedia.org/resource/Korea_University)

OCW: <http://ocw.korea.edu/ocw/>

**Description:** Korea University is a prestigious nonsectarian, private research university located primarily in Seoul, South Korea, and one of the SKY universities, a historical acronym used in South Korea to refer to Seoul National University, Korea University, and Yonsei University. Founded by Lee Yong-ik in the present-day town of Susong in 1905, the school moved to Anam in 1934. The university is one of the oldest institutions of higher education in South Korea and is widely regarded as one of the top three comprehensive universities in the country. KU is a comprehensive research institution consisting of sixteen undergraduate colleges and twenty graduate divisions, ranked 21st in Asia in 2012 by QS World University Rankings.

Korea University\*Universität Korea\*Universidad de Corea\*Universit  Korea\* 高麗大学校\*Universit t van Korea\*高麗大學

Member of: [ Open CourseWare Consortium ]



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# The new generation of Open Educational Resources

**Linked Data** vision enables a new generation of open educational resources that can be **semantically described** and **connected** with other data and **discoverable** sources.

# Conclusions

- For effective use, reuse, discovery, distribution and sharing of OER and OCW repositories must provide a declarative query interface that supports complex expressive Web queries.
- Faceted search and data visualizations are important aspects to visualize, explore, and use Open Educational Resources Data.



# Thanks!

OCWC Global Conference 2014

Theme: “Open Education for a Multicultural World”

<http://conference.ocwconsortium.org/2014/>

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