Open Educational Resources: Experiences of use in a Latin-American context

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Abstract

This paper presents practical experiences using Open educational Resources (OER) for basic and elementary education (K12), educational research and research training on two inter-institutional projects with the collaboration of thirteen higher education institutions and with the support of the Corporación de Universidades para el Desarrollo del Internet (CUDI) and by the Consejo Nacional de Ciencia y Tecnología (CONACYT) of Mexico and hosted by the Tecnológico de Monterrey. The first initiative is titled "Knowledge Hub for K-12 Education" with the main goal of enrich a catalog of Open Educational Resources for basic and elementary education (K-12) for Mexico and Spanish speaking countries in Latin-America. The main goal of the second initiative is to build a collection of Open Educational Resources for Mobile Learning to address the issue of educational research and research training.

Introduction

Tecnológico de Monterrey (ITESM) is a private, non-profit academic institution with 65 years of experience. It is composed of 33 campuses across Mexico that offer high-school programs, undergraduate and graduate degrees, continuing education, as well as social programs. Through technology-based distance programs, ITESM is a pioneer in distance education with more of 20 years of experience through its Virtual University, reaching 29 countries; at present time, the Virtual University offers totally online undergraduate, postgraduate, continuing education, and social programs

ITESM has worked in the past two years in several projects on the reuse of royalty free course materials from Carnegie Mellon University (OLI, 2010), Yale University (OYC, 2010), and the Massachusetts Institute of Technology (MIT-OCW, 2010), with the objective of identifying key critical factors to develop a model to effectively transfer OER. Capitalizing theses experiences, Tecnológico de Monterrey proposed the creation of an important educational initiative, named "*Knowledge Hub*" (Burgos, 2008) at the World Economic Forum (WEF) in Davos, Switzerland, in January 2008 during a Global Universities Leaders Forum session (Galán, 2008).

Knowledge Hub was later named as TEMOA (Temoa, 2010) that represents the words "to seek, investigate, inquire" in the Náhuatl[1] language as a free use catalog that supports a multilingual search engine to allow the user to discover selected Open Educational Resources (OER) using enriched metadata by an academic community and enhanced by librarians, using Web 2.0 such faceted search and social networking tools. The portal website of TEMOA provides public access through the Internet for educators, students and self-learners of all educational levels, from graduate education to K-12 basic education. It was created to assist educators in the challenging task of introducing innovations in the classroom to improve the teaching-learning process, and by consequence, student retention, motivation and attention. TEMOA is a Mexican distance education initiative of the Tecnológico de Monterrey (ITESM) to the world, conceived by the faculty's needs to find instructional materials for teaching and learning with the certainty that the resources found, respects the intellectual property and legal rights from their original authors.

The movement of Open Educational Resources (OER) is one of the most important trends that are helping education through the Internet worldwide, and it's a term that is being adopted every day in many educational institutions. "At the heart of the movement toward Open Educational Resources is the simple and powerful idea that the world's knowledge is a public good and that technology in general and the World Wide Web in particular provides an extraordinary opportunity for everyone to share, use, and reuse knowledge. OER are the parts of that knowledge that comprise the fundamental components of educational content and tools for teaching, learning, and research," (Atkins, Brown, and Hammond, 2007, p. 6).

Research Experiences

Aware of the advances in technology worldwide and the hundreds of thousands of new resources that are published each day on the Internet in an exponential basis, the way we see the world has changed, this also has a significant impact on education, both in the way of learning as in the way of teaching. It is a reality that information is available in massive and exponential way, mainly through digital media on the Internet. The vast majority of the times information is accessed freely without any filter, raising questions about its authenticity, validity, and reliability (ACRL, 2010).

Different studies recognize that knowledge has become a driving force of production, economic development and social growth of the countries (Okunoye & Karsten, 2002; Malhotra, 2003; OECD, 2003; UNIDO, 2003), leading us to recognize that in a globalized environment, information resources and knowledge flow freely without regard to geographic boundaries or limitations due to several critical factors that support the development and welfare in countries, such is the case of technological innovation, economic resources, skills, machinery and other production inputs that move in cycles and dynamic continuous value creation by integrating global learning networks and knowledge. Information technologies have the great potential to facilitate dissemination of knowledge from universities, educational institutions, organizations and governments, as well as to support the design of innovative educational strategies to improve and transform learning environments and to potentiate education.

The first experience research using Open Educational Resources (OER) in this paper is titled "**Knowledge Hub for K-12 Education Project**" an initiative aimed to enrich the classification and indexation catalog of OER for basic and elementary education level, this through TEMOA, for the Latin American academics; with the labor and dedication of teachers and researchers in basic education, to support process improvement and distance education, professional development of teaching, contribute in reducing educational gap, and to foster more equal access to educational resources.

The project was funded during one year in 2009 by the *Corporación de Universidades para el Desarrollo de Internet* (CUDI) and by the *Consejo Nacional de Ciencia y Tecnología* (CONACYT) of Mexico and hosted by *the Tecnológico de Monterrey,* in Mexico. Six higher education institutions were involved: Tecnológico de Monterrey (5 faculty researchers; 5 research assistants), Universidad Regiomontana (2 faculty researchers), Comité Regional Norte de la Comisión Mexicana de Cooperación con la UNESCO, AC (3 researchers), Universidad de Montemorelos (4 faculty researchers), Instituto de Investigación, Innovación y Estudios de Posgrado para Educación, IIIEPE (3 researchers) and Escuela Normal Miguel F. Martínez (5 teachers).

The group of 11 faculty researchers, 5 teachers, 6 researchers and 5 research assistants agreed to work virtually and locally with traditional face-to-face meetings using several communication mechanisms:

- A webpage (Blog) to centralize efforts of communication and documentation process (http://khubk12.blogspot.com)
- Web discussion forums to debate, argue and agree about several topics (http://khub12.umenlinea.com)
- Electronic mail (email)

- Videoconference (Internet 2)
- Chat and web-conference
- Face-to-face local meetings

Also, the group agreed to have several training sessions through videoconference and recorded sessions through DVDs and power point slides. The training's sessions have had the objective to develop new skills and abilities about the use of web technology and information literacy. Also, the training sessions addressed the awareness about Open Educational Resources (OER) and the clarification about the use of resources and materials for teaching and learning purposes in the classroom.

The methodology that was followed was collaborative, where six institutions of higher education worked with twelve basic education institutions; this is two basic/elementary schools for each higher education institution in Mexico (in the State of Nuevo Leon). Was a joint project in a year basis, that allowed us enrich our understanding and knowledge of educational technology through a search tool to support access to Open Educational Resources (OER) available on the Web (Internet network), taking advantage of the academics and researchers support in Mexico and Latin America. There were two main activities that guided the development of the project: (1) first, the linkage of basic education teachers and researchers with the enrichment of a catalog of open educational resources through an academic search portal, (2) compilation of findings project implementation, studies and dissemination of knowledge through journals and papers in specialized conferences, with a view to strengthening the consolidation of research groups involved and the future creation of international networks in which new projects are conceived in educational research in the field of OER and Open Access.

During the project several strategies were followed to accomplish its goals, such as:

a) The group of researchers decided to integrate several working groups to reach the best potential of valuable source of knowledge generation and learning through the creation of a Community of Practice (CoP) on OER.
b) Six projects were developed within the main project; each one for each participant institution, the main goal was disseminate the knowledge on Open Educational Resources, for collaboration purposes and for the implementation of technology at the basic education level (K-12).
c) Every three weeks were project group meetings using videoconferencing as a media for communication purposes.
d) For the delivery of the training workshop for K-12 teachers was used Internet 2 tools.
e) A website was developed for documenting and sharing of ideas among researchers participants: http://khub12.umenlinea.com/
f) One Blog for K-12 teachers was developed: http://khubk12.blogspot.com/

Some of the results are:

A) Between January and April 2009:

- Design of one diagnosis instrument to identify the competence on digital literacy for the participants in the project.
- Design of the training workshop on how to identify, evaluate and classify Open Educational Resources (all six participant institutions collaborated on the design and teaching delivery).
- Creation and production of one workshop and course materials, such as: digital resources, formats, handbooks, handouts, and video tape recording.
- Design of the strategy of call of K-12 teacher's participants and its selection. 150 teachers in 20 schools accepted to collaborate and participate in the activities of the project.
- Defining criteria for identification and evaluation of the website sources of OER.
- Develop of six research projects within the main project, using different methodological approaches.

B) Between May and November 2009:

- Design of four workshops to train K-12 teachers on how to select, document, use and adopt OER within class sessions.
- Production of course materials, such as: digital resources, formats, handouts, and video tape recording.
- On October 2009 there were 150 K-12 teachers participating within the project.
- Total of OER documented for basic education at the end of the project = 291.
- Total of OER used and adopted by K-12 teachers = 101.
- End of the six projects within the main project, using different methodological approaches.
- Four articles published in Journals.

The second research initiative is titled "**Mobile Open Educational Resources for the training of educational researchers**" aimed to generate a collection of open educational resources (OER) for mobile learning, on the topic of educational research and research training to be available in a portal (web site) for free use, reuse and distribution with educational purposes.

The training of educational researchers is a subject that is of interest to be addressed from various perspectives. The project was funded for the year 2010 by the *Corporación de Universidades para el Desarrollo del Internet* (CUDI) and by the *Consejo Nacional de Ciencia y Tecnología* (CONACYT) of Mexico and hosted by *the Tecnológico de Monterrey,* in Mexico. Seven higher education institutions were call to participate: Tecnológico de Monterrey (4 faculty researchers and 3 research assistants), Universidad de Montemorelos (2 faculty researchers and 3 research assistants), Instituto Tecnológico de Sonora (4 faculty researchers and 1 research assistant), Universidad de Guadalajara (2 faculty researchers), Universidad Autónoma de Yucatán (3 faculty researchers), Universidad Autónoma de Guadalajara (6 faculty researchers), Universidad Autónoma Metropolitana (1 faculty researcher).

The group of 22 faculty researchers, and 7 research assistants agreed to work virtually and locally with traditional face-to-face meetings using several communication mechanisms:

- A webpage (site) to centralize efforts of communication and documentation process (http://sites.google.com/site/oer4share)
- Web discussion forums to debate, argue and agree about several topics (http://foros.um.edu.mx/rea)
- Electronic mail (email)
- Videoconference (Internet 2)
- Chat and web-conference
- Face-to-face local meetings

The project is developed through three stages or phases: planning, implementation and evaluation, in a twelve months basis. The expected results for the month of December 2010 are a collection of at least 30 OER for mobile access, seven sub-projects published in journals and conferences, as well as the training of undergraduate and postgraduate research assistants and a workshop to produce digital content according the criteria of OER.

The benefits and impacts that contribute to the field of research, innovation and knowledge transfer on the preliminary results on this initiative are:

A. The planning and selection of subject fields for the production of open educational resources, such as follows:
o Methodological aspects of educational research
o Tools for collecting data for further processing
o Skills for access and use of information (information literacy)
o ICT Oriented data collection and dissemination of knowledge

B. The design of a course-workshop for the development of technological skills in digital production environment for project participants (faculty researchers and research assistants).

A content repository of open educational resources (OER) and mobile learning resources on educational research and research training which will be available in a website, where these resources will be open, free and licensed for use, reuse and distribution in Mexico: http://catedra.ruv.itesm.mx/.

Conclusions and lessons learned

As a group, we decided to integrate several working teams to reach the best potential of valuable source of knowledge generation and learning through the creation of a Community of Practice (CoP) for each research project. A CoP is defined as a "group of people who share a common

interest, a set problems or simply have a passion to share a particular subject and want to deepen their knowledge and experience through various processes of interaction" (Wenger; McDermott; Snyder, 2002).

Considering that a Community of Practice vanishes the several hierarchical levels in a pre-established institutional structure (Saint-Onge & Wallace, 2003; Saint-Onge, 2004), the group of researchers decided to took advantage of this benefit, which helped in the reduction of time in the planning process and the sharing of experiences in solving special subjects. The dynamics group allowed sharing ideas and the consideration of different perspectives with colleagues or peers, helping them to have better decision making. In fact, there was a greater participation and less fear of making mistakes knowing that they had the confidence to have a support group from several institutions.

We learned that to foster effective project learning in the group of participants through several institutions, it's necessary to encourage collaboration and exchange of meanings and experiences.

In the first project titled "Knowledge Hub for K-12 Education Project", the group identified access barriers for the use of Open Educational Resources (OER) in Mexico by teachers in K-12 schools:

- The need for a better technological infrastructure (lack of internet access, projectors and computers to display and use the educational resources),
- Legal issues (access of the resources in terms of licensing),
- Relevance about the content of the materials available on the Internet (resources mainly from other countries making difficult to adopt them in the local context),
- Lack of resources in Spanish (language issues),
- Digital literacy gap in K-12 schools and lack of awareness in the institutional level (lack of information in managerial levels).

In the second project titled "Mobile Open Educational Resources for the training of educational researchers", the group as experienced several institutional challenges:

- The digital production training of faculty researchers and assistant researchers for a mobile learning environment (included the process of acquiring multimedia computers, digital players and software applications for the production of video resources).
- Legal issues (the awareness of the legal terms and the process of licensing the academic work); the group preferred the use of Creative Commons (CC) licenses.
- The decision of use international standards of metadata such as Dublin Core (DCMI) to describe and classify the resources produced in the institutional repository.
- The planning, production and publishing processes according the OER criteria in a digital content repository (included the lifecycle process of the workflow, the definition of user roles, as well as the governing business rules of the institutional repository).
- The decision to use open platforms for storing and publishing the educational resources, such as DSpace (www.dspace.org) and Joomla (www.joomla.org).

The OER's are a great support for academic activities and research as they allow the sharing of content of specialists from various cultural backgrounds in a global context, supporting in this

matter, the internationalization process in the knowledge society. In Latin America to have this kind of resources is of great help to support the training and research processes.

The academic work between institutions enables the creation of networks that enhance efforts to achieve far-reaching objectives, as shown in the results that have been presented in this paper where the eleven participating higher education institutions have been investigating the process of discovering open educational resources available on the Internet, and explore its incorporation in new learning environments enriched by technology. In both projects that have been presented, is explored the use and impact of the OER in basic education schools and the training of educational researchers.

Finally, this paper is an invitation to join efforts in establishing monitoring mechanisms and recognition that supports the educational practice to share experiences on the use of OER through the scientific and intellectual evidence.
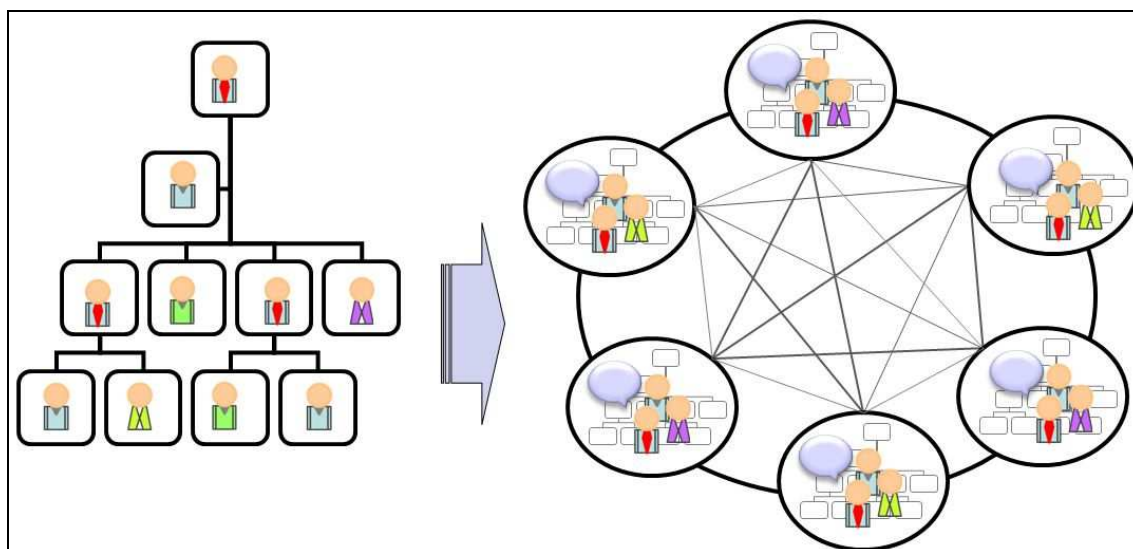
Figures

Figure 1 - Fostering equality of ideas and knowledge sharing

Notes

1. The Náhuatl is a lingua franca that served as communicative language bridge between peoples that made up the various Mesoamerican cultures; see more at Karttunen (1992).

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