

## ARTICLE

# Open educational practices and technology appropriation: the case of the Regional Open Latin American Community for Social and Educational Research (CLARISE)

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## Abstract

A major challenge for the knowledge society is to narrow the education gap, hence the need for strategies that foster innovation and improvement in education. Thus, with the support of technology and the Internet, virtual academic communities have emerged in order to exchange and disseminate innovative educational practices. The objective of the study presented in this article was to analyse the state of open educational practices in the institutions forming part of the Regional Open Latin American Community for Social and Educational Research (CLARISE) in order to diagnose their level of positioning, strategies, implementation, promotion and dissemination. The main research question was: How do open educational practices (OEPs) and technology appropriation develop in teachers belonging to a virtual academic network? In order to answer this question, a case study research methodology was applied, using interviews, participant observation, document analysis and questionnaires as the data collection instruments. The findings indicate that an exchange network fosters open content production and OEP implementation by participating teachers and institutions, promotes the generation and dissemination of materials such as open e-books and scientific journals, encourages members to use open educational resources (OERs), facilitates open content sharing and promotes the development of OEPs, thus enabling teachers to learn how to properly communicate the licensing of their work. While the CLARISE network shares and disseminates cultural production all over the world, the participating institutions are placed in an early and developing state with regard to OEPs because such practices have yet to be institutionally incorporated into their educational models. The community's members have only reached a second level of technology appropriation as no repurposing of OERs is done by them.

## Keywords

technology appropriation, open educational practices, open educational resources, virtual academic networks, communities of practice, CLARISE network

## *Prácticas educativas abiertas y apropiación tecnológica: el caso de la Comunidad Latinoamericana Abierta y Regional de Investigación Social y Educativa (CLARISE)*

### *Resumen*

*Un gran reto en la sociedad del conocimiento es disminuir la brecha educativa, por lo que es necesario promover estrategias que impulsen la mejora e innovación en la educación. Así, con el apoyo de la tecnología y el internet, surgen las comunidades académicas a distancia para intercambiar y difundir las prácticas educativas innovadoras. El objetivo de esta investigación fue analizar el estado de las prácticas educativas abiertas en instituciones participantes de la Comunidad Latinoamericana Abierta Regional de Investigación Social y Educativa (CLARISE), para diagnosticar su nivel de posicionamiento, estrategias, implementaciones, promoción y difusión. A partir de la pregunta de investigación «¿De qué manera se desarrollan las prácticas educativas abiertas (PEA) y la apropiación tecnológica en docentes que pertenecen a una red académica a distancia?» se adoptó la metodología de investigación del estudio de casos, y en la recolección de datos se utilizaron instrumentos como la entrevista, la observación participante, el análisis de documentos y el cuestionario. Los hallazgos obtenidos indican que una red de intercambio impulsa la producción de contenido abierto y la implementación de PEA en los docentes e instituciones participantes, y promueve la generación y disseminación de materiales como artículos en revistas científicas y los ebook abiertos; también motiva a los integrantes a utilizar recursos educativos abiertos (REA), facilita la comparación de contenidos abiertos y fomenta el desarrollo de las PEA, lo que permite que los docentes aprendan a comunicar de manera apropiada el licenciamiento de su obra. La red CLARISE comparte y difunde producción cultural en todo el mundo, colocando a las instituciones participantes en un estado inicial y*

*de desarrollo en relación con las PEA, debido a que institucionalmente todavía no han adoptado estas prácticas en sus modelos educativos. Los integrantes de la comunidad alcanzan solo un segundo nivel de apropiación tecnológica pues no realizan la modificación de REA.*

### ***Palabras clave***

*apropiación tecnológica, prácticas educativas abiertas, recursos educativos abiertos, redes académicas a distancia, comunidades de práctica, red CLARISE*

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## 1. Introduction

Virtual academic networks created using the Internet seek to innovate and improve education by generating cultural content and educational resources that contribute to the development of the educational practices of those belonging to them. Through such networks, communities have emerged in order to promote open access to knowledge, the production, selection and use of open educational resources (OERs), and open educational practices (OEPs) that foster innovation in teaching methods and strategies, all driven by the open education movement (OEM).

Studies conducted by education institutions and organisation have shown that OEM initiatives have brought wide-ranging benefits to nations. The opportunities to extend educational coverage, the possibilities of promoting learning for all and the prospects of developing a new culture of knowledge sharing are some of the findings of these studies (OECD, 2007; UNESCO, 2005; The William and Flora Hewlett Foundation, 2012).

It was in this context that 2011 saw the creation of the Regional Open Latin American Community for Social and Educational Research (CLARISE, <https://sites.google.com/site/redclarise/>) on the OEM topic as part of the CLARA Communities 2011 (COMCLARA2011) programme funded by the Latin American Advanced Networks Cooperation (RedCLARA). CLARISE is formed by teachers and researchers whose aim is to jointly generate academic content that fosters the development of OEPs by participating institutions, and technology appropriation by teachers who are members of the community.

This article analyses how the CLARISE community operates in order to evaluate the members' level of mobilisation, practices, network exchange, technology appropriation and contribution to the construction of OEPs..

## 2. Open educational resources (OERs) and open educational practices (OEPs)

“OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge” (Atkins, Brown, & Hammond, 2007). In this respect, these resources enable educational processes to be enhanced by the possibilities of integration into learning environments.

OEPs are practices that include the creation, use/reuse and repurposing of OEPs in order to innovate and improve education (OPAL, 2011a). Beyond the use of resources, OEPs encompass the overall idea of shaping open access educational experiences, such as training courses, workshops, seminars, networks, support anthologies and activities aimed at mobilising education in an accessible way for communities.

Communities of practice are formed by people who interact with each other and exchange ideas on the same topic and, as mentioned by Wenger, McDermott, and Snyder (2002), besides the expertise (topic) and community (people), the third component is practice, which, in the case of open access networks, refers to the generation of open knowledge and the promotion of OEPs in participating institutions.

Several studies have shown that, in education, OERs are important elements for innovation and improvement. In addition, they enable students to achieve learning that is more meaningful (Braun, Hernández, Santos, Talamante, & Yu, 2010; Garza, Hernández, & Santiago, 2010; Guerrero, Juárez, Sánchez, & Vázquez, 2010). Other authors have noted that academic networks or communities of practice promote mutual help and the development of processes of reflection among teachers who are members of them (Viscovick, 2006; Hew & Hara, 2007), and that technology appropriation by teachers using OERs does not reach the third level of technology appropriation (Celaya, Lozano, & Ramírez, 2009).

However, besides the importance of continuing to foster projects to promote open access to, and the production, dissemination, use and reuse of OERs, it is important to identify how the knowledge generated by academic bodies impacts on the improvement of pedagogical processes within educational communities; in other words, to find out how the process of knowledge mobilisation occurs. According to Bennet and Bennet (2007), knowledge mobilisation is a process that extends from the creation and construction of knowledge by experts to the use and application of knowledge in the context of communities. In this respect, it is crucial to construct knowledge that provides information about the construction of open knowledge and its impact on the improvement of educational practices.

### 3. Method

In this study, a case study research methodology (Yin, 2009) was applied to the CLARISE network to analyse the following: How do open educational practices (OEPs) and technology appropriation develop in teachers belonging to a virtual academic network? The constructs were: open educational practices (OEPs), technology appropriation, academic networks and open educational resources (OERs).

*3.1 Population and sample.* The study population consisted of 27 participants in the CLARISE formal group. The sample was selected by non-probability sampling, in which not every element of a population has the same probability – whether equal or zero – of being selected as part of the sample (Giroux & Tremblay, 2004). In addition, invitations to take part were sent by e-mail to CLARISE members, seven of whom agreed to do so; these formed the case study sample.

*3.2 Topics, categories and indicators.* The main research topics were OEPs and technology appropriation: the CLARISE community case, with the aim of analysing the state of OEPs in the community's participating institutions to obtain a diagnosis of their level of positioning, strategies, implementation, promotion and dissemination. Based on the research question, the analysis categories were: knowledge mobilisation, OEP maturity, virtual academic networks, technology appropriation using OERs and identification data of the community's participants. The indicators in each category were: (a) for the category *Knowledge mobilisation*, the indicators came from the movement's stages as noted by Burgos and Ramírez (2011), sharing, selecting, disseminating and mobilising knowledge; (b) for the *OEP maturity* category, the indicators came from the *OEP Guide* (OPAL, 2011b), trajectory, strategies, implementation and promotion of OEPs; (c) for the *Virtual academic networks* category, the indicators came from the characteristics proposed by Wenger et al. (2002) to establish the level of participation of the community's members, prior network experiences and exchange; and (d) for the *Technology appropriation using OERs* category, the indicators came from the levels of appropriation proposed by Colás, Rodríguez, and Jiménez (2005), knowledge, use and repurposing. In addition, identification data were collected, including age, gender, level of education, current job, school year taught and role within the community.

*3.3 Data sources.* Yin (2009) has stated that, when collecting data, it is essential to ensure that the evidence has been confirmed and that theories to be explained are included. Thus, the data sources used were: teachers, institution representatives, the CLARISE coordinator and organiser, and documents from websites such as minutes, recorded videoconferences and institutional documents.

*3.4 Data collection techniques.* Four data collection techniques were used: (a) observation of the participants at the community's work meetings, where data on appropriation, networks and mobilisation events were collected and then classified in grids, including names, behaviours and situations (the meetings were recorded in streaming video format); (b) in-depth interviews, where data on OEPs, networks and appropriation were collected from key informants (Yin, 2009) and in

accordance with the roles (Stake, 1999) of the participants, institutions representatives and the coordinator (the interviews were conducted via Skype); (c) the document analysis instrument collected data on the OEPs, networks and appropriation, where the indications given by Yin (2009) and Stake (1999) were taken into account; these allowed the data collected in the other instruments to be corroborated, and codes were allocated to identify the frequencies or contingencies in the data collected (sections of the community's website <https://sites.google.com/site/redclarise/> were analysed, including communication and press, technological tools, published works, training, funding), as was the educators' virtual seminar on the topic of the OEM (only posts made by those in the study sample); and (d) the survey explored the trajectory, strategies, implementation and promotion of OEPs (administered on docs.google.com).

*3.5 Data capture and analysis.* Using the strategies proposed by Yin (2009), the data were recorded in tables and documents different from the interpretations. To determine the validity of the study, the strategy proposed by Stake (1999) of data source triangulation was used, creating a triple-entry table to triangulate the data for categories, sources used and instruments. In accordance with the proposal by Stake (1999), the following were performed in the content analysis: direct interpretation and categorical aggregation, which were transferred to tables whose column titles corresponded to the selected categories. Stake (1999) has stated that, to determine the validity and reliability of a study, some kind of triangulation strategy must be used, and he refers to data source triangulation, which occurs when what was observed or reported has the same meaning when we collect those data under other circumstances. Hence, a triple-entry table was created for this study in order to triangulate the data for categories, sources used and instruments.

## 4. Results and analysis

Having applied the instruments and performed the categorical aggregations (Yin, 2009; Stake, 1999), the results obtained are presented below, contrasting them with conceptual data to give validity and reliability to the content of the findings.

The availability of strategies for sharing open content helps a virtual academic community's members to share the resources that they produce. This was evident in the strategies that the community used to attain the objective of uniting efforts to raise the visibility of and provide open access to the cultural, scientific and academic outputs of Latin American authors and institutions, which are freely available to everyone and focus on three main aspects: (1) producing journal articles for peer-reviewed journals, (2) producing a chapter for the e-book (Ramírez & Burgos, 2012) and (3) participating in forums and conferences to raise awareness of the community. Burgos and Ramírez (2011) have noted that the first stage of knowledge mobilisation is to share information generated in different formats by teachers, researchers and students on the Internet, which coincides with the perceptions of the CLARISE participants, who said that they felt confident with and supported by the community when it came to generating open content by producing articles for publications on

different websites, whether repositories, databases or peer-reviewed journals, to name but a few. This indicates that the act of belonging to a virtual academic network that shares open content helps to generate this type of content while sharing knowledge.

The availability of catalogued, validated resources can provide a virtual academic community's members with the opportunity to select and use them. This assertion was obtained from various sources: during the interviews, the participants indicated that when they looked for an OEP, they did so on TEMOA (an OEP indexing system: <http://www.temoa.info/es>); when analysing the community's website containing links to OEPs; from the work meeting observations and through the seminar offered by the community. Burgos and Ramírez (2011) have stated that the second stage of the OEM occurs when OERs are selected through a variety of strategies, such as searching in specialist catalogues. This shows that a virtual academic network offers its members strategies that enable them to select catalogued, validated OERs for use in their teaching.

A teacher's membership of a virtual academic network for OEP exchange promotes the use/reuse of OERs within educational practice. This was identified from the results of the questionnaire on OEPs and from the interviews, where the respondents said that OERs were used on some courses; some at least once a week and others less frequently, though they always included OERs in the courses that they taught. They implement OEPs even when doing so is not a generalised practice in their respective institutions. In accordance with Baumgartner's approach (cited by OPAL, 2011b), an OEP best practice is one that contains a high degree of OER use and creation, and high degree of pedagogical model openness. This means that virtual academic networks help to embed an open vision of OEPs by fostering OER use in educational practice, thus creating pedagogical models that are more and more open.

Teachers forming part of a virtual academic network that raises awareness of and shares OEPs transfer that awareness to the members of their respective institutions. In the OEP maturity questionnaire and the interviews, the participants answered that only some teachers in their respective institutions had the motivation to create and use OERs on some courses, although individually they had begun to use Web 2.0 tools such as blogs or Facebook and applied quality assurance controls to OEPs, despite not being fully conversant with technology use; likewise, in the interviews, the members said that they had shared the activities carried out by the CLARISE community with the teachers or thesis students with whom they worked. The *OEP Guide* (OPAL, 2011b) defines an OEP maturity state from "Early Stages – Awareness" to "Developing – Commitment" when teachers individually use Web 2.0 tools or blogs to share OEPs and create or use OERs. Consequently, belonging to a virtual academic network that promotes the OEM and OER use generates the teachers' commitment to undertaking the academic network's proposals, thus initiating the process of OEP maturity in their respective institutions.

By sharing OERs in a virtual academic network, teachers are aware of, use and reuse available resources, and by doing so they promote technology appropriation. This finding was obtained from the interviews with the teachers, who mentioned that it was not always possible to repurpose an OER for several reasons, one of which was that they did not have the right software to do so, another was that they did not have the know-how, and yet another was that it was not always necessary to repurpose it. However, if it was necessary to do so, then they would rather look for another OER that

was better suited to their needs; in other words, they use and reuse OERs that have already been produced. Hooper and Rieber (1995) have noted that the technology utilisation phase is when the teacher tries out the innovation in the classroom; it is the second phase of technology appropriation, when software or a simulator is used, which in this study is an OER. Thus, it is affirmed that technology appropriation by the teachers participating in the virtual academic network reaches the second level, that is to say, the use/reuse of OERs, which leads to innovation in teaching practice.

The inclusion of metadata to facilitate OER searches is one of the criteria that can be considered beneficial to the selection of an OER. In all the interviews, the members said that metadata fall within the criteria that they use to validate OERs. In addition, from the document analyses of seminar content, it became clear that one of the characteristics of OERs was that sufficient information about the resource should be included. In this respect, Sicilia (2005), Habler (2009) and DAR (2010) have noted that metadata help to do a quicker, simpler search; Sicilia adds that the reusability of resources depends largely on the metadata. Thus, it can be concluded that the members of communities of practice for OERs are becoming aware of the importance of generating OERs with proper metadata to ensure that they can be located and selected easily by other individuals.

Teachers participating in a virtual academic network on the OEM topic use open licences to share OERs and protect copyright. This was observed when reviewing the articles shared on the community's website and contained in the open access e-book, as all of them have a Creative Commons licence. From the interview with the coordinator and from the questionnaire results, it was also found that the institutions participating in the network used intellectual property and copyright licences to regulate the use and creation of OERs. It has been asserted (Castaño et al., 2008) that, besides protecting copyright, Creative Commons licences enable third parties to properly use content covered by them. This may be interpreted as affirming that a virtual academic network that raises awareness of the copyright topic enables the generation of content with the proper licences, which leads to the possibility of them being shared both inside and outside a network.

## 5. Conclusions and recommendations

Having analysed the results, it is time to return the research question: How do open educational practices (OEPs) and technology appropriation develop in teachers belonging to a virtual academic network? According to the evidence, it is possible to state that:

- (a) OEPs are developed by mobilising knowledge and implementing strategies to make open content available, thus enabling the members of a virtual academic network to share the resources that they produce, and to use open licences to share them and protect copyright.
- (b) OEPs benefit from the teachers' membership of a collaborative network that promotes the use/reuse of OERs in educational practices, with catalogued, validated resources that give them the opportunity to select and use them, and to contribute to the development, awareness and sharing of OEPs in the institutional sphere.

- (c) Technology appropriation using OERs in a virtual academic network gives teachers the opportunity to discover, use and reuse the resources available, to share strategies, to promote training on OER-related topics and bring its members together in order to select these topics, thus determining that the inclusion of metadata is one of the criteria that can be considered beneficial to the selection of these resources. These actions facilitate the first two stages of technology appropriation; however, in the case studied, even when there were signs of interest in repurposing OERs within the community, no evidence was found of a third level of appropriation, as the teachers preferred to use resources already available in repositories that, in addition, were selected according to the topic that they needed to support.

It is concluded that the CLARISE community seeks OER transfer to or appropriation by the community's members through various strategies, such as training and the inclusion of links for resource selection in order to accomplish the implementation of OEPs in the participating institutions. Furthermore, it can be said that OEPs in the institutions belonging to the community are at different levels of maturity; in other words, (a) some are just setting off on the path towards these practices, (b) some are developing them by including them in their curricular designs and policies, and (c) some have implemented them in some courses, whether face-to-face, blended or fully online.

From the results, it is evident that, in order to make progress on the OEP topic through virtual communities, it is crucial to promote OEP and technology training processes to foster the repurposing of OERs. It is also crucial to foster and continue raising awareness of copyright and of the visibility of open licensing arrangements on the resources that the teachers find on specialist websites, such as institutional and thematic repositories. The same applies to the promotion of communication via social networking sites like Facebook or Twitter, because the community undeniably belongs within them too, and they could be good methods for disseminating the activities, works and actions that the community carries out, and for sharing knowledge.

Finally, it should be noted that the OEM covers the stages of resource production, use and/or selection by the academic community, dissemination by spreading open content via journals, training activities, repositories, networks and the mobilisation of practices, which include not only using OERs in learning environments, but also ensuring that strategies and connective actions – and even new knowledge – are developed in networks. This article extends an invitation to contribute to accessible knowledge for all.

## References

- Atkins, D., Seely, J., & Hammond, A. (2007). Report to the William and Flora Hewlett Foundation. Retrieved from [http://www.hewlett.org/uploads/files/Hewlett\\_OER\\_report.pdf](http://www.hewlett.org/uploads/files/Hewlett_OER_report.pdf)
- Bennet, A., & Bennet, D. (2007). *Knowledge Mobilization in the Social Sciences and Humanities*. Frost, W.V.: MQI Press.

- Braun, I., Hernández, S., Santos, E., Talamante, L., & Yu, Y. (2010). REA: aliados en el desarrollo de la comprensión lectora de estudiantes de inglés [OERs: Allies in the development of reading comprehension in students of English]. In M. S. Ramírez & J. V. Burgos (Eds.), *Recursos Educativos Abiertos en ambientes enriquecidos con tecnología* [Open Educational Resources in technology-enhanced environments] (pp. 242-257). Monterrey, México: Innov@TE.
- Burgos, J. V., & Ramírez, M. S. (2011). Innovative experiences of Open Educational Resources towards academic knowledge mobilization: Latin-American context. *Proceedings of OpenCourseWare Consortium Global 2011: Celebrating 10 Years of OpenCourseWare*. Cambridge, MA. Retrieved from [http://www.ruv.itesm.mx/convenio/catedra/recursos/material/ci\\_34.pdf](http://www.ruv.itesm.mx/convenio/catedra/recursos/material/ci_34.pdf)
- Castaño, C., Maiz, I., Palacio, G., & Villarroel, J. D. (2008). *Prácticas Educativas en entornos Web 2.0* [Educational practices in Web 2.0 environments]. Madrid, Spain: Síntesis.
- Celaya, R., Lozano, F. L., & Ramírez, M. S. (2009). Apropiación Tecnológica en los profesores que incorporan recursos educativos abiertos (REA) en educación media superior [Technology appropriation by teachers who incorporate open educational resources (OERs) into higher middle education]. *Revista Mexicana de Investigación Educativa*, 15(45), 487-513. Retrieved from <http://redalyc.uaemex.mx/pdf/140/14012507007.pdf>
- Colás, P., Rodríguez, M., & Jiménez, R. (2005). Evaluación de e-learning. Indicadores de calidad desde el enfoque sociocultural [Assessment of e-learning. A sociocultural approach to quality indicators]. *Revista electrónica Teoría de la educación y Cultura en la Sociedad de la Información* Monográfico: Estado actual de los sistemas e-learning, 6(2). Retrieved from [http://www.usal.es/~teoriaeducacion/rev\\_numero\\_06\\_2/n6\\_02\\_art\\_colas\\_rodriguez\\_jimenez.htm](http://www.usal.es/~teoriaeducacion/rev_numero_06_2/n6_02_art_colas_rodriguez_jimenez.htm)
- DAR (2010). *Repositorio Digital. "DAR: Desarrolla, Aprende y Reutiliza", Escuela de Graduados en Educación del Tecnológico de Monterrey* [Digital Repository]. Retrieved from <http://catedra.ruv.itesm.mx/>
- Erlanson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry. A Guide to Methods*. Newbury Park, CA: Sage.
- Garza, A., Hernández, I., & Santiago, X. (2010). Uso de REA para un mejor aprendizaje de las Ciencias Naturales [Use of OERs to improve learning in Natural Sciences]. In M. S. Ramírez & J. V. Burgos (Eds.), *Recursos Educativos Abiertos en ambientes enriquecidos con tecnología* [Open Educational Resources in technology-enhanced environments] (pp. 242-257). Monterrey, México: Innov@TE.
- Giroux, S., & Tremblay, G. (2004). *Metodología de las Ciencias Humanas* [Methodology for Social Sciences and Humanities]. México DF: Fondo de Cultura Económica.
- Guerrero, R., Juárez, L., Sánchez, L., & Vázquez, A. (2010). La motivación a través del uso de Recursos Educativos Abiertos como herramientas didácticas para el logro de aprendizajes significativos. Un estudio comparativo de cuatro prácticas docentes [Motivation through the use of Open Educational Resources as didactic tools to achieve meaningful learning. A comparative study of four teaching practices]. In Ramírez, M. S. & Burgos, J. V. (Eds.), *Recursos Educativos Abiertos en ambientes enriquecidos con tecnología* [Open Educational Resources in technology-enhanced environments] (pp. 489-509). Monterrey, México: Innov@TE.
- Habler, B. (2009). *Access to Open Educational Resources. Report of UNESCO OER Community discussion*. UNESCO. Retrieved from [http://oerwiki.iiep.unesco.org/images/c/ca/Access2OER\\_final\\_report\\_2.pdf](http://oerwiki.iiep.unesco.org/images/c/ca/Access2OER_final_report_2.pdf)

- Hew, K., & Hara, N. (2007). Empirical study of motivators and barriers of teacher online knowledge sharing. *Educational Technology Research & Development*, 55(6), 573-595. doi:10.1007/s11423-007-9049-2
- Hooper, S., & Rieber, L. (1995). *Teaching with Technology*. Retrieved from <http://www.nowhereroad.com/twt/>
- OECD (2007). *Giving Knowledge for Free. The Emergence of Open Educational Resources*. Paris, France: OECD Publishing.
- OPAL. (2011a). *The OPAL Report 2011 Beyond OER: Shifting Focus to Open Educational Practices, The "Open Educational Quality Initiative"*. Retrieved from [http://portal.unesco.org/ci/en/ev.php-URL\\_ID=31243&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=31243&URL_DO=DO_TOPIC&URL_SECTION=201.html)
- OPAL. (2011b). *OEP Guide. Guidelines for Open Educational Practices in Organizations (Vs. 2011)*. Retrieved from <http://oer-quality.org/>
- Ramírez, M. S., & Burgos, J. V. (Coords.) (2012). *Movimiento educativo abierto: Acceso, colaboración y movilización de recursos educativos abiertos* [Open educational movement: Access, collaboration and mobilisation of open educational resources]. Retrieved from <http://catedra.ruv.itesm.mx/handle/987654321/564>
- Sicilia, M. A. (2005). Reusabilidad y reutilización de objetos didácticos: mitos, realidades y posibilidades [Reusability and reuse of learning objects: Myths , realities and possibilities]. *RED. Revista de Educación a Distancia*, IV(011). Retrieved from <http://www.um.es/ead/red/M2/sicilia46.pdf>
- Stake, R. E. (1999). *Investigación con Estudio de casos* [The Art of Case Study Research]. Madrid, Spain: Morata.
- The William and Flora Hewlett Foundation. (2011). *Open Educational Resources Initiative*. Retrieved from [http://www.hewlett.org/uploads/files/OER\\_overview.pdf](http://www.hewlett.org/uploads/files/OER_overview.pdf)
- UNESCO (2005). *Towards Knowledge Societies*. Paris, France: UNESCO.
- Viskovic, A. (2006). Becoming a tertiary teacher: learning in communities of practice. *Higher Education Research & Development*, 25(4), 323-339. doi:10.1080/07294360600947285
- Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Boston, EE.UU: Harvard Business School Press.
- Yin, R. K. (2009). *Case Study Research Design and Methods* (4th ed.). Los Angeles, CA: Sage.

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