Reorientación de la práctica educativa usando REA: resultados preliminares con tres docentes mexicanos de posgrado

Educational practice reorientation using OER: Preliminary results of three Mexican faculty at postgraduate level

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Palabras clave
Recursos educativos abiertos, prácticas educativas, transformación educativa, apropiación tecnológica; educación superior

RESUMEN

El trabajo presenta los resultados preliminares de un estudio de caso múltiple de corte cualitativo cuyo objetivo fue analizar la manera en que se dan las prácticas educativas de profesores virtuales del área de educación a nivel maestría cuando incorporan recursos educativos abiertos (REA), así como la forma en que esta apropiación de REA contribuye con la transformación de la práctica pedagógica. En la investigación participaron tres docentes de maestría de una universidad mexicana. El análisis de datos fue realizado, primero, revisando cada caso, codificando y categorizando inicialmente con base en los referentes teóricos establecidos y afinando según emergían los datos. Luego, se llevó a cabo la suma categórica de los casos como conjunto para obtener resultados globales. Los resultados indican que la práctica educativa de los participantes se desarrolló en forma predominante con una apropiación tecnológica a nivel de reorientación, usando en su mayoría artículos científicos de acceso abierto para realizar actividades con un enfoque de enseñanza de profundización del conocimiento. Los docentes, al emplear REA, reconocen cambios en la práctica educativa, como enriquecimiento en el diseño de los cursos, flexibilidad pedagógica, variedad de recursos, personalización de la enseñanza, desarrollo de enfoques centrados en el estudiante y apoyo en el obtención de competencias. Este trabajo contribuye al conocimiento sobre la ejecución de prácticas educativas con inclusión de REA en un contexto mexicano, además de su potencial impacto en estas.

Keywords
Open educational resources, educational practices, educational transformation, technological appropriation; higher education

ABSTRACT

The aim in this paper is to present the preliminary results of a qualitative, multiple case study whose objective was to analyze the way educational practices (EP) are carried out by virtual faculty, when they incorporate Open Educational Resources (OER), as well as the way in which this appropriation of OER contributes to the pedagogical transformation of these practices in the field of education at a master's level. The research involved three faculty of a Mexican university. The data analysis was performed; first, by reviewing each case, initially coding and categorizing in base to the established theoretical references and then tuning as the data emerged. Subsequently, the categorical sum of the cases was made as a whole to obtain global results. The results indicate that the EP of the participants developed predominantly with technological appropriation at the reorientation level, using mostly open access scientific articles to carry out activities with a teaching approach of deepening into knowledge. Teachers using OER recognize changes in their EP such as the enrichment in course design, pedagogical flexibility, variety of resources, personalization of teaching, development of student-centered approaches, and support in the development of competencies. This paper tries to contribute to the knowledge about the implementation of EP when OER were included and carried out in a Mexican context, as well as its potential impact on these educational practices.

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INTRODUCTION

With the arrival of globalization and of a society based on knowledge, the need to train students has been changing. Education in the 21st century requires that students' training include skills that imply the management of knowledge and the application of technology as main tools more than its instrumental use (OECD, 2010). Hence, the demand to master competencies such as having critical thinking, being creative, reflexive, working in teams, solving problems, mastering technologies and knowing how to communicate (Sunkel, Trucco and Espejo, 2014).

This new context obliges us to change the way we plan and implement the teaching and learning processes based on content transfer (Pedró, 2015) to accommodate other processes that attend the current training demands which are different from the former ones. Therefore, teaching must be different, focused on the student, be competitive, play a more active role, be collaborative and create knowledge in the student. The role of the professor must change from a provider of information to a process facilitator, among other characteristics. Moreover, the school, in order to face new learning challenges, pinpoints having another vision of the use of technology in her educational processes since the majority of competencies necessary in the 21st century are supported or improved by the use of information technologies and communication (ICT) (OECD, 2010). The problem resides in the fact that sometimes schools adopt innovative ICTs but teach them with didactics lacking important pedagogical renewal when what is actually required are active students producers of knowledge (Area, 2008; Pedró, 2015).

On the other hand, with the communication and information opening provided by ICTs, new resources such as open educational resources (OERs) have emerged to support teachers' practices. Since their introduction in the educational field, OERs have provided teachers not only with some freely accessible (open license), innovative, editable and flexible materials, but have also offered them hope and support in transforming the current educational contexts, since OERs facilitate the improvement of educational processes besides helping students to become more active in their learning process (Gómez-Zermeño, 2012).

As for the previous researches related to the national implementation of OERs in the educational environment, the findings of the studies conducted show the favorable contribution of these resources in the students' learning process allowing them to attain meaningful academic achievements (Salado, 2011; Salazar, Rodríguez and Campos, 2012), to increase their motivation (García, Glasserman, Lascares and Perales, 2010; Guerrero, Juárez, Sánchez and Vázquez, 2010) or to develop active learning (Glasserman, Mortera and Ramírez, 2013). Research has also been conducted on OERs and the open educational movement, and the challenges of this movement posed in distance education have been analyzed (Ramírez, 2013a) and training course on said movement have

been presented in the Latin American environment (Ramírez, 2013b). Another topic of interest in education refers to open educational practices. (Glasserman, 2012) has identified their phases and (Lázaro, Ocaña, Ramírez and Burgos, 2012; Betancourt, 2012) have studied the state of said open practices within higher education institutions and academic networks. These studies have been conducted at the elementary, high school and higher education institutions or on research networks.

The teachers have presented their experiences with the OERs implementation in the educational environment, more specifically in the fields of computer sciences, human training and sciences (Macías, López and Ramírez, 2012; Zúñiga, 2012) and also on the technological appropriation of the teachers in using OERs (Celaya, Lozano and Ramírez, 2010; Reyes, 2011; Yépez, 2014); said studies focus on the elementary, high school and higher educational levels and the fields of physics, mathematics, languages, computer sciences, health, etc.

At an international level, we have found some researches on students' insights (Hurt, 2013; Lindshield and Adhikari, 2013; Rowell, 2015) as well as of teachers on the OERs or their usefulness in higher education (Font, 2011; Irshad, Jawed, and Riaz, 2013, Rolfe; 2012), the reutilization of contents (Pegler, 2011; Rodrigo, Martín and Arguedas, 2013; Wild, 2011), as well as the way in which students and teachers incorporate OERs in their educational practices in redesigning a program (Goodwin, 2012), among others.

In spite of the researches on the topic, the Mexican academic community possesses a fairly limited knowledge of OERs (Macías, López and Ramírez, 2012; Salazar, Rodríguez and Campos, 2012), and their implementation in educational practices is a rare occurrence. The topic of OERs lacks greater dissemination; it has been more than ten years since their implementation, and still today, we have not achieved going beyond the production of and access to OERs to integrate them in the educational practices to improve the quality of teaching since the pedagogical aspect of the OERs is not considered in the general discussion on the topic (Geser, 2007) and the mobilization of the open knowledge has been overlooked (OPAL, 2011).

Against this backdrop and for research purposes, it was relevant to analyze the way in which the incorporation of OERs in the Mexican educational practices and the way teachers take possession of these resources and the way this appropriation contributes to the pedagogical transformation of their educational practices.

The uniqueness of this study lies within the combination of elements not found in the revision we have made of the literature, such as the use of OERs in educational practices, at the postgraduate level, in the field of education and the virtual mode. It is worth mentioning that this paper presents the progress of an ongoing research and, in which cases, involving

additional types of OERs other than those already presented are going to be analyzed. This document is divided into an introduction, theoretical framework, results, analyses and conclusions.

THEORITICAL FRAMEWORK

The following concepts and theoretical references have been our guidelines in developing our research:

Open Educational Resources

The UNESCO (2012) defines OERs as any type of educational materials of the public domain which are used for teaching, learning or research or are introduced with an open license that anyone can freely use, adapt and distribute. OERs include the following:

> Complete course/programs, course materials, modules, students' guidelines, class notes, textbooks, research articles, videos, evaluation tools and instruments, interactive materials such as simulations, role games, databases, software applications (including mobile applications) and any other material useful to any education level (UNESCO, 2015, p. iii).

The use made of OERs implies actions such as: retain, reutilize, revise, remix and re-distribute said materials (Wiley, 2014).

According to the William and Flora Hewlett Foundation (2013), Hylén, Van Damme, Mulder and D'Antoni (2012), Butcher (2011) and McGreal (2012), OERs have many benefits; they reduce costs and times, pave the way to improving the quality of educational resources, facilitate their adaptation to different contexts, improve teaching and develop personalized learning, provide equal access to knowledge and help share and preserve knowledge. OERs have proven beneficial especially to teachers by providing them with greater accessibility of didactic materials, offering them more options and a variety of resources, opportunities to create learning communities, flexibility to modify materials, saving time through the reutilization of resources, promoting educational approaches focused on making the students' participation more active, generating contents, attending to the specific needs of the students, and creating research and collaboration networks, among others (Butcher, 2011; OLCOS, 2012; Hylén *et al.*, 2012).

OERs Transformational Potential

In reference to their transformational potential and openness, OERs bear specific characteristics that support the educational transformation (Butcher, 2011). The UNESCO (2015) not only mentions that the transformational potential of OERs is related to the power to share and to collaborate between people and institutions of different contexts and to open new educational models, but also indicates that its incorporation does not lead *per se* to the efficiency and quality of practices, since the

latter obey to educational routines to which they relate. Therefore, the OERs transformational potential could depend on improving the quality of educational resources by means of peer revision, taking advantage of contextualization, personalization and localization of resources, highlighting openness, providing more training to the teachers on the use and creation of OERs, attending the necessities of students with specific needs, optimizing the personnel and institutional budgets, offering the resources in the local language of the apprentices, having the students choose and adapt the OERs with the purpose of encouraging them to get involved more actively in their learning process, and use local resources with the corresponding recognition.

Technology Appropriation

Technology appropriation is the process by which people adopt a technology for one's personal use and with a specific purpose. Dourish (2003) defines technology of appropriation as the way in which technology is adopted, adapted and fitted into working practices" (p.467) and it shows up when the control of the use given to as technological tool is transferred from the context where it was generated to individuals (Colás & Jiménez, 2008).

Model of Technology Adoption in the Classroom

In order to assess the type of OREs appropriation in education, we draw on Hooper & Rieber (1995) model of technology integration in the classroom that describes the progressive levels of use of technology in education from the familiarization model, which is when the tool is known only but not applied in the classroom; second, through the use and integration stages in which the tool is used but without provoking any changes on the pedagogy implied; third, reorientation, where changes are starting to happen and, lastly, the evolution phase in which the professor transforms his pedagogical practices in an ongoing manner and seeks new forms of applying technology to teaching and diffusing knowledge.

Educational Transformation and New Practices in the 21st Century

Transforming education practices coherent with the 21st century occur within teaching practice formats that attend the needs of the knowledge-based society and which main characteristics are: focused on the student; facilitate personalized and flexible teaching; located; focused on results and competencies; based on projects and collaborations, present changes in the roles of the teacher who becomes more a process facilitator than a content provider; and of the student who stops being a passive recipient to someone who seeks, chooses, constructs and communicates knowledge collaboratively through learning communities (Cable Impacts Foundation, Partnership for 21st Century Learning, and the State Educational Technology Directors Association [CIF/P21/SETDA], 2015; CISCO, 2009; Pedró, 2015; Unesco, 2013).

UNESCO ICTs Competency Framework for Teachers

The framework proposed by the UNESCO (2011) highlights the fact that, for teachers to have the competency in using ICTs and be able to teach them does not suffice; they must also encourage their students to use ICTs in collaboration with others, be creative and solve problems in order to participate in the 21st century society. To do so, the UNESCO proposes three teaching approaches that refer to the progressive degree of pedagogical competency that teachers must acquire: *digital alphabetization* (knowledge and integration of technology in the teaching spaces), *knowledge expansion* (which implies using knowledge and technology to carry out activities such as real life problem solving, collaborative learning and project implementation) and *knowledge creation* (this implies building learning communities, creating products and sharing these with external communities, besides everything mentioned in the previous approach).

Pedagogical Reasoning and Action Model

Shulman (1987/2005) pedagogical reasoning and action refer to the stages or phases a teacher undergoes in his educational practice from the beginning of the pedagogical reasoning to the end of the pedagogical action process; these are: comprehension (pedagogical reasoning), transformation (planning), teaching, evaluation, reflection and new ways of understanding. This model allows us to analyze the way in which the educational practice develops when incorporating OERs.

Connectivism

This theory sustains that learning occurs in contexts with changing elements that are not completely under the apprentice's control and may even be external to him. He reports that groups of information linked to other connections help learn more, hence, individuals find knowledge through networks (made up of human beings, organizations or other technological elements) (Siemens, 2004/2007).

METHODOLOGICAL DESIGN

In this qualitative research, we analyze the natural development of a phenomenon and, to understand it without any manipulation of events (Corbetta, 2007), we address it through a multiple case study (Stake, 1999). Given the nature of the research questions: how are educational practices given when we incorporate OERs? and, how does the appropriation of OERs contribute to the pedagogical transformation of the teachers' educational practices? These questions imply an in-depth analysis of a specific situation, the development of educational practices with the incorporation of OERs within a real context (Stake, 1999; Yin, 1994). We introduce two constructs: the OERs appropriation process in

the teachers' educational practices and the pedagogical transformation through OERs appropriation.

The objectives pursued were: to characterize the OERs appropriation made by the teachers; determine the way in which the teachers carry out educational practices when incorporating OERs; and to describe the way in which the pedagogical transformations generated occur with the appropriation of OERs in educational practices, from the teacher's perspective.

Population and Sample

The population consists of a group of postgraduate professors in the field of education that teach online courses at a university in Northern Mexico. For convenience, we used a non-probability sample (Hernández, Fernández and Baptista, 2006), to analyze the educational practices of the three cases we had access to at this stage of the study.

Data Collection Techniques and Instruments

We used non-participative observation techniques to collect data to review the courses housed in the virtual platform; the semi-structured interview to use with permanent university professors, and the document analysis to review the learning products of the students participating in those courses. The instruments implied were the observation grill, the semi-structured interview guide and the analysis blog (Stake, 1999). To verify the validity of the project, we triangulated information sources (professors, e-course, documents and theoretical references) and instruments (observation, interview and document analysis) (Stake, 1999; Yin, 1994). The study reliability was conducted with the detailed description of the case and with the documentation of the procedure followed in the study (Yin, 1994).

Data Procedure and Analysis

The data procedure and analysis were carried out by means of the classification of the information collected through interviews, documents and observations. Next, each case was examined separately and the initial codification was carried out based mainly on Shulman's (1987/2005) theoretical framework and the stages of his pedagogical reasoning and action model in the progressive levels referred to by Hooper and Rieber (1995), in the classroom technological adoption model, in the types of openness of an OER identified by Wiley (2014), in the phases of open knowledge mobilization mentioned by Burgos and Ramírez (2011), as well as in the teaching approaches proposed by the UNESCO (2011) in its ICTs competency framework for teachers.

Subsequently, we registered the data of all the cases on a concentrated table which we analyzed to find pattern matching among the cases to improve the categories. Next, we carried out the categorical sum of the set

of cases that show the patterns and number of cases in which they were identified, within the corresponding categories and sub-categories (Stake, 1999). Lastly, we examined the information of all the cases globally to determine the significant findings.

Context

The paper is based on the development of educational practices with the incorporation of OERs, incorporated in courses of master's degree in the field of education of a Mexican higher education institution with an educational model centered on students. The courses are developed completely online and interact with students asynchronously in spaces such as forums, areas of assignment delivery, ads, etc., in a private technological platform and with regular meetings through virtual conferences. The academic activities are governed by a sixteen-week activity calendar.

RESULTS OF EACH CASE

After triangulating the data from the three instruments, we present the results obtained for each case:

Case A

This case refers to the contents on the use of pedagogical theories in the educational practice. The teachers group was trained by a permanent professor and a tutor. The permanent professor designed the course using a connectivist planning approach. She is known to love OERs and participates actively in the open educational movement in Mexico. In this course, she incorporates different types of OERs such as PowerPoint, videos, compilations of pages, learning objects, among others. The students carry out activities and generate products of open knowledge based on the conceptual and procedural content provided by OERs used in the course. Connections with international experts and a MOOC evaluation are included as examples to design an open course.

First, each participant individually prepares a case with his teaching notes, licensed by Creative Commons, and second, in a group, they prepare a scientific article on the implementation and evaluation of the course they designed; and lastly, they sent the article to open access journals. Since the students carry out innovative activities using OERs which enable them to become producers of open knowledge, hence, the technological appropriation represents evolution. The teaching approach in the course is based on the creation of open knowledge. The permanent teacher pinpoints that, through the use of OERs in her educational practice, she has modified the design of her courses making them more connectivist and also enriching them with learning experiences. She also mentions the access to a variety of materials that can even modify the possibility of using

open pedagogies and support the development of competencies and learning personalization.

Case B

This case deals with contents on the use of technology to innovate the educational process. The course has one permanent teacher and four tutors. The permanent teacher, the course designed, has been working with OERs for the last ten years and has incorporated them in this course in the form of scientific texts such as articles, essays or reports on educational tendencies. Students carry out their activities based on the conceptual content of the course with OERs, as organizers of information, in an individual and collaborative way, and the development of a preliminary research draft, also carried out collaboratively. However, these products are not shared openly with other communities. Therefore, the level of their learning approach does achieve generating knowledge but only consolidation. There is no evaluation of the learning products generated. The appropriation of the teacher is to be found at the level of reorientation since OERs are not applied in different or transforming activities. The permanent professor, as professor, points out that OERs provide a greater availability of free and accessible quality and updated resources. She also indicates that the latter allow pedagogical freedom without depending on the access to resources to comply fully with the designs. She also indicates that OERs can help develop competencies.

Case C

Case C refers to a master's degree course that deals with contents on aspects of psychology of adolescence. The course has one permanent professor and a tutor. The permanent professor designed the course in which OERs were incorporated as scientific articles and web tools to develop infographs. The students executed their activities based on the conceptual content of the topic of the subject accessed through OERs such as: solution of case studies, infographs and an educational intervention project. Here again, these products were not diffused outside the course and did not reach the teaching approach of generating knowledge. The products obtained by the students in this course were not evaluated. The teacher's appropriation is to be found at the level of reorientation since practices that formulate new proposals on the use of OERs in academic activities are not carried out. The permanent professor points out that by using OERs in her educational practice, she found free and accessible resources easily. She also indicated that by using OERs in her teaching practices open doors and she did not feel limited economically; on the contrary, the teacher can be more creative and innovative by using her skills and motivation in her educational practices. She also mentioned that OERs help students in adopting an active role, in developing competencies and paying attention to different learning styles.

RESULTS OF THE CATEGORICAL SUM AND ANALYSIS

As we recall, we have two questions and three research objectives. As for the latter, we began by determining the two research constructs established and, in this organization, we expounded and discussed the results. Therefore, by taking into consideration the categories resulting for each construct, we presented the corresponding sum of categories and their analysis. It should be mentioned that the global results analysis for the first construct was based on the theoretical categories laid down by Hooper and Rieber (1995), Wiley (2014), UNESCO (2011), Burgos and Ramírez (2011) and Shulman (1987/2005), while the analysis of the second construct was conducted in an inductive manner, according to the emergence of data.

First Construct: Teachers' Appropriation of OERs

According to the results shown in Table 1, the category of OERs appropriation, we identified that in general OERs are used to support activities in which the student constructs his knowledge, implying that the student plays an active role, which, according to Hooper and Rieber (1995) classroom technological adoption model, represents the reorientation stage. To attain this level of OERs appropriation, we have skipped the familiarization stages since the teachers know OERs, utilization and integration, since they have reviewed them, selected and incorporated them to the academic activities of the course, and have reached to reorientation level aforementioned. Their use is linked to the activities in which the student has an active role in constructing his knowledge, which involves collaborative work, problem solving and project design (See Table 2). However, in general, (in two of the three cases) the practices involving new ways of using OERs have not been carried out, for example, those involving the student as the author of the open content or in those in which OERs are modified; therefore, evolution, the highest level of appropriation, is not attained.

On the other hand, scientific texts are the type of OERs that predominates in the courses; this could be because scientific publications constitute a significant part of the total of the subjects the students at the educational level need to access for their learning (Butcher, 2015). However, this is not defining since in the third case, a greater variety of resources are included which support activities such as videos, learning objects and web pages, information that shows that it is possible to incorporate other types of OERs at this level; we have reached an area of opportunity in regard to the utilization of an extensive range of existing OERs, as mentioned by the UNESCO (201|5): videos, interactive materials, course materials, etc.

Although teachers are familiarized with OERs and have incorporated them in their educational practice, their management only reaches the levels of retention and reutilization (selection and use as they are), without attaining more advanced levels as those cited by Wiley (2014), such as the

review or modification of used OERs, the remix or combination of two or more OERs to issue a new one and its corresponding dissemination. This is particularly resonant since one of the OERs main characteristics, from their definition, is their flexibility to be adapted, as their license permits, to better meet the contexts to which they are applied (UNESCO, 2012).

Table 1. Categorical Sum: OERs Appropriation Characteristics

Sub-category	Descriptors	Pattern (s) found	Number of cases
OER Appropriation	Technology Appropriation Level	Reorientation	2
		Evolution	1
OER Characteristics	Type of OER incorporated	Scientific Readings	2
		Readings, videos, presentations, learning objects, *open e-book* and TEMOA catalogue	1
	OER supply source	Institutional and external	2
		External only	1
	Licensing	The teacher uses Creative Commons to license of look for OERs	2
		The teacher recognizes Creative Commons, but does not consider it essential to seek OERs	1
Use and contextualization of OERs	OER openness level	In the course, OERs are managed at the reuse level only, they are not modified, mixed or disseminated	3
	OER predominance in the course	In the course, OERs are combined with other type of materials of limited Access	3

Note: The appropriation referred to is based on the levels proposed by Hooper and Rieber (1995) and the OERs openness refers to the levels presented by Wiley (2014).

In regard to the characteristics of the educational practice category, to which OERs are incorporated, in reference to Table 2 and following the pedagogical reasoning and action proposed by Shulman (1987/2005), we observe that in the educational practice of the cases analyzed, OERs are incorporated at the stages of pedagogical reasoning, planning and execution. Teachers have a positive perception of the use of OERs as support of their practices and, they also select their materials according to a critical analysis to find the most appropriate ones, thus becoming contents curators. Planning presents characteristics distant from the practices of mere transmission of knowledge, and involves activities in which the student uses the contents provided by OERs in order to apply and produce knowledge. The usefulness of the OERs in education was the tool that provided conceptual and procedural inputs that supported the activities centered on the students such as case solving and project design, through collaborative work and, in one case, open knowledge creation was

even attained as teaching and research material shared by the academic community.

This allows us to see that, according to the UNESCO (2011) framework of teachers' competencies in the use of ICTs, the teaching approach that outstands in the cases studied, is at the level of knowledge deepening, in which knowledge and technology are used to solve problems or design projects; nevertheless, we discern that they are still areas to be addressed in regard to the diversity of possible innovative practices to be carried out with the support of OERs in which the student must get involved as a producer of contents and participate with the knowledge society and the sharing of knowledge is promoted with external communities, attributes pertaining to the level of knowledge creation, which was attained in one case only.

As for the characteristics of open educational practice category developed by the teacher (See Table 3), we find that the three professors carry out OERs selection and use activities in their educational practices. However, only two of them carry out OERs production and dissemination. It calls our attention that only one professor generates OERs specifically designed for teaching besides the open access scientific articles he creates. The third professor develops OERs formatted in articles that represent authentic materials implemented in teaching; however, they were not conceived for such purpose. Therefore, we observe that professors do not produce OERs, especially those prepared for academic purposes.

Thus, we sustain that most of the teachers studied address all of the phases of open knowledge mobilization suggested by Burgos and Ramírez (2011): sharing, selecting, diffusing and mobilizing open knowledge. On the other hand, we should point out that the teachers studied belong to an institution that does not have any formal policies for the use of OERs in its current educational practices. This contrasts with the UNESCO (2015) recommendation for higher level institutions in regard to establishing institutional policies that foster the production and use of OERs in educational practices.

Table 2. Categorical Sum: Characteristics of the Educational Practice with the incorporation of OERs

Sub-category	Descriptor	Pattern (s) found	Number of cases
Teacher's pedagogical reasoning	Students' insight	With different profile and potential as authors They possess previous knowledge to benefit from They construct their personal knowledge	1 1 1
	Approach of the subject	Project development	2

		Connectivist project development	1
	REA Conception	They found OERs useful/support in teaching	3
Teacher's pedagogical action	PLANNING		
	Material Selection	Through the teacher's critical reflection	2
	Didactic strategies implied	Learning based on problems Learning through projects Collaborative work	2 3 3
	Didactic approach used	Knowledge deepening	2
		Knowledge creation	1
	OERs function in the activities	Content Knowledge	1
		Content and software knowledge	1
		Content knowledge and as example	1
	OERs adaptation	OERs are not modified	3
	INSTRUCTION		
	Teacher's role	Guide in learning activities	3
	Student's role	Active role in activities	3
	Interaction with knowledge	Student applies knowledge	2
		Student develops open knowledge	1
	Activities mode	OERs are used in individual and group activities	3
	EVALUATION		
	Type of evaluation	Formative and summative	3
		Diagnostic	2
		Self-assessing	2
		Co-assessing	2
		Evaluation by OERs produced	1
	Type of learning evidence	Project documentation	3
		Information organizers	2
		Case solving Document	1
		Open knowledge products (article or case)	1
	REFLETION		
	Type of reflection	Reflect on teaching and the use of OERs	3
	DISSEMINATION		
	Dissemination of products of knowledge	Within the course or on limited Access networks	2
		In open access journals or repositories	1

Note: This review is based on the phase of Shulman's (1987/2005) pedagogical action and UNESCO (2011) teaching approaches.

Table 3. Categorical Sum: Characteristics of the teacher's open educational practice

Sub-category	Pattern (s) found	Number of cases
Type of activities to mobilize open knowledge	Production of OERs	2
	OERs Selection and mobilization in the activities	3
	OERs Dissemination	2
Institutional policies on the use of open resources	The teacher says there are no formal institutional policies on the use of OERs.	2

Note: The activities mentioned referred to Burgos and Ramírez (2011) phases of open knowledge mobilization.

Second Construct: Pedagogical Transformation through the Appropriation of OERs

As for the results shown in Table 4 and the category of pedagogical transformation of educational practice by incorporating OERs, teachers have seen that by permeating their educational practices, OERs have brought about beneficial changes in the design of their courses. They have adopted a more constructivist approach that enriches the students' learning experience. Their repertoire of materials has not only increased but it is also updated, easily accessible and free to support their teaching, giving them more pedagogical freedom since they do not have to depend on the type of materials the students have at hand or have access to in order to carry out the course activities. The different OER formats contribute in fostering personalized learning by using different learning styles which has made focusing on the students to support the development of competencies a viable approach.

Butcher (2011), OLCOS (2012), Hylén *et al.* (2012), McGreal (2012) and The William and Flora Hewlett Foundation (2013) have mentioned that OERs bring benefits to the teachers. In our cases studies, we have identified some of these benefits as being the increase of options and a variety of quality materials, costs saving, greater access to contents, possibility of rendering educational practices more flexible, teaching personalization and student support in developing a more active role in their pedagogical activities. However, we have also identified, at a lesser extent, important attributes that could be thought as characteristics of educational practices with OERs given their philosophy of social construction of knowledge; these are: the sharing of knowledge in different contexts, the intra-e inter-institutional collaboration and evaluation pointed out by the UNESCO (2015) and Hylén *et al.* (2012). This was observed in one case only. Moreover, the teachers did not mention any other representative features such as the possibility of OERs adaptation as cited by Hylén *et al.* (2012) and McGreal (2012), and the students' participation in the selection and adaptation or creation of OERs as pinpointed by OLCOS (2012) and UNESCO (2015); these features also represent other opportunities of strengthening educational practices.

Table 4. Categorical Sum: Pedagogical Transformation of the Educational Practice

Sub-category	Pattern (s) found	Number of cases
Course Design	Enrich the learning experience and allow a more connectivist design of the course	1
Materials	Increase the availability of options of the teacher	2
	Accessible	2
	Free	2
	Updated /Of quality	1
Pedagogical Flexibility	Allow pedagogical freedom without economical limits	2
	Allow the implementation of open pedagogy	1
Development of competencies	Critical thinking	3
	Learning to learn	2
	Innovation	2
Focus on the student	Allow active learning	2
Contribution to the educational approach	Contribute with inputs in activities deepening or knowledge creation	3
Personalization of learning	Allow using different learning styles by means of different resources	2

Source: Developed by the author.

Lastly, in the analysis of Table 5, according to the saying of the teachers, we have retrieved important aspects such as the need for the academic community to develop greater knowledge of the OERs and for the teachers and students to have greater empowerment as producers of open knowledge. However, what has called our attention the most was the fact that the three teachers acknowledged the usefulness of OERs as support for teaching. The importance of adapting OERs to an appropriate instructional design was stressed, which is in line with Gesser's (2007) thinking that no institution should assume that the easy and free access to valuable contents will also lead to changes in the traditional pedagogical models. OLCOS (2012) also emphasized the fact that, if OERs are inserted in traditional educational practices in which the teacher is the central figure, the use of OERs will not bring about any educational change.

Table 5. Categorical Sum: Conditions for transforming educational practices with OERs

Sub-category	Pattern (s) found	Number of cases
Knowledge of OERs	That the teachers know OERs and their potential	2
Techno-pedagogical Binomial	The most important thing to transform educational practices falls on how to link OERs to the instructional design.	2
Promotion of OERs with students and teachers	Promote the production of OERs for teachers and students as producers of open knowledge	1
Institutional support	The institution has an innovative vision that provides the infrastructure necessary to carrying out open practices	1

Source: Developed by the author.

On the other hand, in contrast with the characteristics of transformed educational practices suggested by CIF/P21/SETDA (2015), CISCO (2009), Pedró (2015) and the UNESCO (2013), we have found that the use of OERs in the educational practices analyzed, have the following benefits: they allow the favorable development of an approach centered on the student. We have also observed that OERs represent an input for activities that involve active learning such as problem solving, project development and collaborative work, which are strategies required for the development of the competencies needed in the 21st century. Moreover, they contribute in "flexibilizing" teaching since they offer a greater range of materials which, in some cases, can be modified to allow a greater pedagogical freedom and to foster the enrichment of the learning experiences which, according to the teachers, are not limited by any economical or accessibility aspects. Likewise, OERs support the personalization of teaching thanks to the availability of different formats that allow addressing the different interest and learning styles.

The crossing of educational borders is strengthened by the online ubiquity and availability of OERs chosen to allow their access whenever teachers and students need them. Likewise, they encouraged the change of role of the teacher and the apprentice; the teacher went beyond his traditional teaching method of content transmission to designing activities that imply the construction of learning evidence. On the other hand, it encouraged the apprentice to drift away from passive activities and to adopt a more active role in learning through activities that use learning products favorable to the application of knowledge. In one of the cases, we saw that the development of open contents also converted the student into a knowledge communicator.

It is important to stress that notwithstanding the fact that teachers have identified benefits in using OERs, in general, they said that even by incorporating OERs in their courses, they have not experienced significant changes in the way they teach, mainly because of their pedagogical competence. However, it is worth mentioning that the UNESCO (2015) has pinpointed several conditions why the transforming effect of OERs is not felt in the educational practices we have analyzed.

CONCLUSIONS

In this paper, we have presented and analyzed the results of a research trying to respond to the following questions: What happens to educational practices when OERs are incorporated? and, in which way does the appropriation of OERs contribute to the pedagogical transformation of the teachers' educational practices? By taking into consideration the results on how teachers transfer OERs to their daily teaching practices, we conclude the following:

The predominant level of technological appropriation in educational practices is reorientation, i.e. OERs are used as support for activities that

imply the active construction of knowledge by the student; however, no new educational use is given to said resources; therefore, it does not attain the level of evolution. The type of OERs generally used was open access to scientific texts. Teachers use OERs as they find them. They do not edit them or create new ones from other OERs. Finally, they incorporate OERs in their course in combination with other type of restricted access materials.

In regard to the development of the educational practice when OERs are incorporated, teachers consider their students as adopting an active role when they participate in the educational experience and acknowledge their subject as an approach that generates projects, and OERs as a useful element within their practice. As for the pedagogical action, we find that the predominant teaching approach is the deepening of knowledge that encloses teaching strategies centered on the student, as learning based on problems, for projects and collaborative work.

OERs are used mainly for the knowledge of procedural/conceptual content of the course and as basis in order for the apprentices to carry out other academic activities. The teacher becomes the content curator and his role is to guide the activities and, the students' role is to apply knowledge even though they create knowledge products that, in general, are not shared with external audiences. On the other hand, the predominant open educational practices developed by the professors were the selection and mobilization of OERs. We also identified that there are no formal policies that promote the use of these resources within the institution.

As for the transformation of the design of the course we need: greater availability of quality materials, accessible, free and updated, that allow pedagogical flexibility and activities centered on the student that support the development of competencies, that contribute to the personalization of the teaching and that facilitate the role of the student who, at times, becomes the producer of contents.

Notwithstanding the fact that the teachers have identified the benefits of using OERs in their practice, they continue to stress the importance of the type of pedagogy used besides adding new resources when it comes to transform educational practices since the mere use of OERs does not suffice to experience significant changes. Thus, we must also consider the pedagogical use in educational practices in which OERs have been integrated since their transforming potential, according to the authors who were consulted, would bear better fruit if they were integrated to renewed teaching activities.

On the other hand, notwithstanding the existence of researches at national level on topics related to OERs, for example, their contribution in students' learning, open educational practices within the open educational movement and the teachers' technological appropriation of OERs, among others, it is still necessary to obtain greater knowledge on said resources,

as well as to incorporate them in a more innovative manner in the educational practices so said practices may continue to evolve and meet the 21st century requirements.

We have identified some areas of opportunity in the educational practices within the institution, such as the use of a greater variety of resources, a greater production of OERs more specifically directed to teaching, the use of other benefits of OERs in educational practices – such as the adaptation and execution of educational practices that imply new uses of OERs – and the dissemination of open knowledge; this is to move forward the evolution of the educational practices that will be developed within this context by postgraduate professors in the field of education.

With the observation that this research is qualitative, it does seek to generalize results. We point out that its contribution to the field of knowledge is to make known the experience of the educational practices of three teachers that use OERs at the postgraduate level in a Mexican context, as well as to give some clues on the potential impact the use of OERs has in the cases studied with the support of the Organization for Economic Co-operation and Development (OECD, 2008) that sustains that there is a substantial need to have more information on who are the users of OERs and how are they using them.

Finally, as part of the steps following this research, we will continue analyzing educational practices with other types of OERs to determine the differences in the execution of educational practices and the changes identified from the work carried out with these resources.

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