Open Educational Resources in virtual teaching communities

Recursos educativos abiertos en comunidades virtuales docentes

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ABSTRACT

Formative models related to the theory of connectivism are increasingly flexible, open and participatory. Under this trend, ideas such as virtual teaching communities (VCT) or Open Educational Resources (OER) have been widespread, which lead us to talk about online educational opportunities. Accordingly, this work seeks and analyzes the uses and potentialities of "educational resources of free access" in a VCT, while examining the meaning that members of that community give to the OER. In addition, a qualitative research procedure endorsed the development and validation of data-collection instruments, such as an interview and an indicator guide to analyze and evaluate the OER shared in a VCT, through participant observation, which is characterized by exchange processes and collaborative work among teachers. Among the main findings, it is observed that virtual communities have a greater presence in teacher training, where the impulse and expansion of OER is verified. These facts highlight the importance of the research field of flexible and open education with technology and particularly, the potential use of VCT, where OER have a special relevance in teacher training.

RESUMEN

Los modelos formativos ligados a la teoría del conectivismo son cada vez más flexibles, abiertos y participativos. Bajo esta tendencia, se han expandido ideas como las comunidades virtuales docentes (CVD) y los recursos educativos abiertos (REA), que plantean oportunidades educativas en línea. El presente trabajo buscó conocer y analizar los usos y las potencialidades que tienen los "recursos educativos de libre acceso" en una CVD; además, se examinó el significado que los miembros de esa comunidad dan a los REA. Para esto, se recurrió a un procedimiento cualitativo de investigación que permitió la elaboración y la validación interjueces de dos instrumentos de recolección de datos: una entrevista y una guía de indicadores de análisis que, mediante la observación participante, permitió evaluar y analizar los REA compartidos en una CVD, y que está caracterizada por los procesos de intercambio y trabajo colaborativo entre docentes. Dentro de los principales hallazgos se observó que las CVD tienen mayor presencia en la formación del profesorado, donde se constató el impulso y la expansión de los REA. Se evidencia la importancia general de investigar el ámbito de la educación flexible y abierta, y de forma específica el potencial empleo de CVD, donde los REA tienen una especial relevancia en la formación docente.

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INTRODUCTION

Social transformations resulting from the boom of digital technologies has taken new ways to communicate with and relate to people. This series of advances is happening in education which, in addition to the consolidation of technological means on the students' daily life, fosters changes on instructional modalities, as well as on the possibility to articulate new learning environments capable to adapt to the needs, cultural context and concerned of every person (Igelmo & Laudo, 2017). It is necessary to answer to the challenge this digital society is demanding, from a new concept of learning, and to try educational proposals that are open, flexible and adjusted to students' needs. This transformation and change process is studied by Cabero *et al.* (2018), both in instructing the faculty and in the learning processes of students.

In addition, access and application of new educational resources on their own do not generate innovating environments. For technology to be relevant, it is necessary to have accompaniment and counseling strategies that let us carry out the articulation of these educational proposals in the classroom. Hence, it is convenient to reflect on the benefits of technology on education with the purpose that this does not turn into a saving mirage to problems arising, as is sustained by Bartolome *et al.* (2018). With this perspective, this work is centered in known and analyzing the significance, uses and potentialities of free- access educational resources in a virtual learning communities (VLC). The purpose of the research is to analyze why and how do teachers use OER in VLC.

With regards the term '*virtual community*' (hereinafter, VC), it must be emphasized that the human being has belonged to different communities throughout history, where he/she has learned, in turn, from the members thereof. At an educational level, there have been learning communities (hereinafter LC), that assume a transformation process of the school inherited from the industrial society towards a participating school that guarantees equal opportunities (Flecha, Prados & Puigdellivol, 2003).

Coll, Bustos & Engel (2007) understand that VC as an infrastructure enabling consolidation and extension of communication and exchange networks, and operate as an instrument aimed to promote and potentiate the learning process of their members. In the work of Rebollo, Garcia, Buzon & Barragan (2012) it is explained how LC promote links that intertwine and expand by means of dialogue and communication, which establish horizontal participation and dialogic communication, in addition to giving rise to relationships of equality and reciprocity.

After the review of different documentary sources, the definition of '*learning cibercommunity*' of Murua, Domingo & Cacheiro (2015) is proposed. In this line, an advance is made towards teaching-learning models that have become more flexible, open and participative, which gives rise to the concept of open education (Valverde, 2010). These virtual instructional contexts, in addition to models liked to connectivism

(Siemens, 2006) and to the expansion of virtual communities –aided by the boom of expanded education and the development of OER– have fostered a change of the paradigm in education (Creelman & Ossiannilsson, 2011).

In light of the foregoing, it is proper to ask: what is an open educational resource? According to Atkins, Brown & Hammond, OER are defined as:

Those resources aimed to teaching and learning under the dominion of and public license, which, in turn, allow the generation of works that derive from other persons. Within OER full courses are defined, as well as course materials, books, videos, software, and any other material and tools that aid and support and access knowledge (Atkins, Brosn & Hammond, 2007, p. 4).

Instead of OER, other authors have proposed the term 'open educational practices', defined by Cronin (2017) as the activities that include the creation, used and reuse of OER, added to the open exchange of teaching practices. On the other hand, Atenas & Havemann (2014) understand OER as available learning materials by means of open and free licenses. Boney (2007) makes reference to the open code (*Open Source*) as a software distributed under a license to see and change the base source code of the application; this helps in reusing and sharing content, by means of an archive and repository system of open contents.

Regarding the criteria that are to be taken into account in respect to OER, Pinto (2010) understands that contents ought to be of quality, have clearly defined learning objectives and with the possibility of feedback and motivation for students, in addition to allowing for effectivity of the resources and optimizing usability, having a clear and systematic design, and having reusability (*using the content in other learning contexts*).

Caheiro (2011) classifies OER as a function of their use in resources for information, learning and collaboration, which clarifies the application thereof. There are project and communities where the use of OER is potentiated (Butcher, Kanwar & Uvalic-Trumbic, 2015), such as: JORUM[1], whose purpose is that of building a community to share, reuse, and redraft teaching and learning materials; Teacher Education in Sub-Saharan Africa (TESSA)[2], following the same objective; LORN (Learning Object Repository Network; OER 4 Open Schools, and CoL (*Commonwealth of Leaning*). Additionally, it is important to mention the OER Commons[3] (2007) initiative, developed by the Study of Knowledge Management in Education, an online library that allows searching and discovering OER. In Spain, it is the excellent work of the National Center for Curricular Development in Non-Proprietary Systems (CeDeC, by its acronym in Spanish)[4], and institution that provides the educational community with

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[1] See www.jorum.ac.uk
[2] See www.tessafrica.ne
[3] See http://www.oercommons.org
[4] See http://cedec.educalab.es

resources and materials by means of design, promotion and development thereof. The Agrega Project[5] is also important, based on OER banks which as an open library to educational resources and contents. In parallel, INTEF[6] has a Procomun[7] web available to the educational community, that contains diverse VC as a function of a series of topics.

Among recent studies on the educational use of OER, the revision of literature done by Wiley *et al.* (2014) is emphasized, where the increase of studies on learning objects (LO) and OER is presented. This highlighted growth is especially owed to the multiple repositories available and which allow anyone to contribute to the creation and publication of content.

In spite of the number of possibilities with respect to the use of OER, it is necessary to discuss on the teaching practices with these resources (Bass, Admiral & Van den Berg, 2019). In this regards, Area (2017) verifies that online platforms of educational content have not really opted for these possibilities and potentialities of the digital environment. Hence, the main barriers found by teachers regarding the use of OER, according to Belikov & Bodily (2016) are: the lack of information, the difficulties to find repositories and the confusion to tell the difference of OER in the face of other digital resources.

Ellis (2017) presents the need for teachers to exchange information and cooperate in the dissemination of the innovating educational practice which has an impact on the members of the educational community. For this, it is necessary to introduce pedagogic changes along with active methodologies that foster participating models and encourage interactivity and connectivity of the educational community (McKenna et al., 2016). Regarding the use of OER by teachers, Weller *et al.* (2017) present the implication of using this in the educational practice, which, in addition to exchanging information which takes place in the VC, makes these resources to be of quality and efficient in the teaching practice (Pinto *et al.*, 2012).

Ultimately, these phenomena are a reflection of the relevance to research for an emerging discipline in constant progress towards an open and flexible education model, where the use of VC is increasingly potentiated, and where OER are especially important.

METHOD

A qualitative style methodology was employed for this study with the purpose of knowing and analyzing the use of OER in a VLC. The meaning, uses and potentialities of teachers who participate in the community are described on free-access educational resources, while we try to understand what for and how teachers use the OER. With this purpose, the virtual community '*Procomun Recursos Educativos Abiertos_STEM*' (*STEM*

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[5] See http://agrega2.red.es
[6] See https://intef.es/
[7] See https://procomun.educalab.es/es/contenido/acerca-de-procomun

Pro-Common Open Educational Resources), which is part of the Pro-Common Educational Space, an initiative of the Ministry of Education upon which the '*Proyecto Agrega*'[8] stands.

Two instruments were used to collect data: on the one hand, observing participants by means of a guide of indicators prepared for this study and, on the other hand, the development of interviews of teachers who partake in the selected virtual community, this allowed us to obtain different sources of information, in addition to learning about and analyzing this community. Figure 1 shows the procedure done in the study.
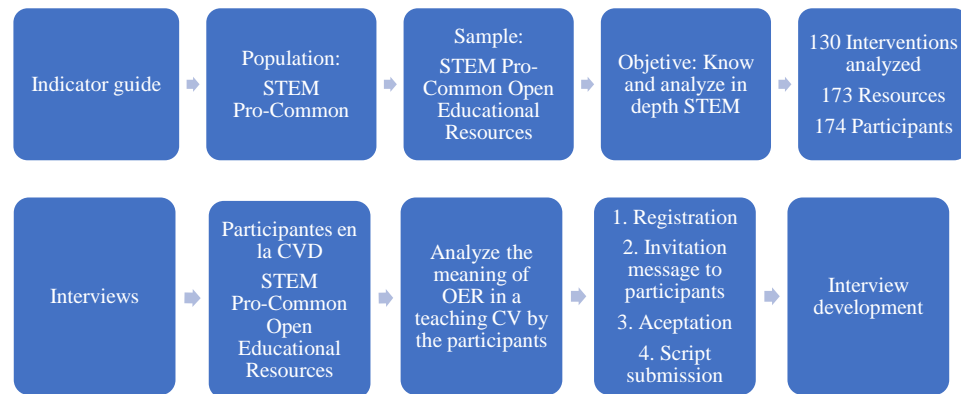

Figure 1. Developed procedure.

During preparation of the indicators guide for the study of the virtual community, the works of D'Antoni (2008), Ke & Hoadley (2009), Atenas & Havemann (2013), Temoa (2017, quoted in Reyes, Juarez, Martinez & Sanchez, 2017), Mishra (2017) and Chou & Hsu (2018) were considered. This made it possible to prepare a first draft of the guide, which contained 27 indicators. Dimensions and indicators, as well as their correspondence, are shown in table 1.

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[8] See http://agrega.educacion.es/

Table 1. Dimensions/indicators analysis correspondence.

Accessibility	
• Community name (1) (1 = Descriptive specifications) (2 = Evidence YES/NO) • Main theme (1) • Access (1) • Community social media profile (1) • Are there like-minded communities? (2) • Role of users (1) • Community rules / community plan (2) • The rules and know to the members (2)	• Main language and other languages available (1) • Website adapted to all types of devices / Universal accessibility website (2) • There are contents divided into educational levels, area of knowledge and type of material (2) • Different OERs are shared among the community and observations are shown on the experience, quality and usefulness of the OER. (2) • Recognition through digital badges or awards (1) • Main OER repositories used (1)
Community content and OER use	
• Activities based on OER are presented for their application in the classroom (2) • Methodological criteria and didactic application are shared (2) • The community has tags by course and area (2) • There are didactic guides with the objectives and contents of the resource (2)	• Assessment instruments and procedures are clearly indicated (2) • The procedure is detailed or the educational experience developed with the OER is narrated (2) • OER are shown labeled by subject (2) • Community members allude to their participation in innovative projects (2)
Participation and collaboration	
• It is easy to access the modification and adaptation of OER (2) • The type of license is specified for all resources (2) • There are installation steps and instructions (2)	• Allow downloading the original file or source code of resources so that it can be adapted (2) • Relevant information on technical instructions for the correct use of OER is displayed (2)
Interaction / communication between members of the virtual community	
• OER is shared with the rest of the participants of the virtual teaching community (2) • News and updates about OER are shared (2) • Offers REA material (2)	• They ask for help and OER material for their classes (2) • Offer help to other users in the community (2) • Provide critical feedback on the repositories used (2) • Provide critical comments on OER (2)

In order to analyze the meaning given by the participants in a VCD to OER, we started from previous work for the design of the structure of the script used for the interview, for example, the studies of McGreal (2004), OECD (2007), Hur & Brush (2009), as well as the study of Glasserman &

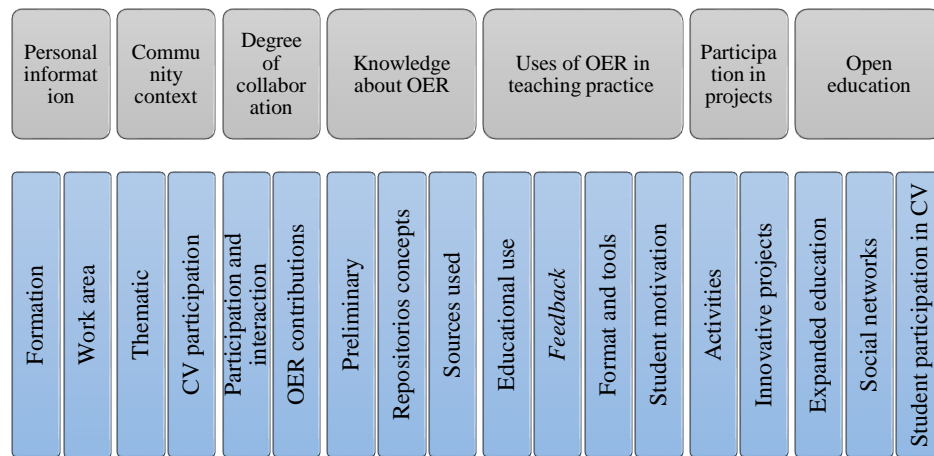Montoya (2014). The structure and questions in the script are shown in figure 2.

Figure 2. Interview script.

Both instruments, (*the analysis indicators guide and the interview script*) have been submitted to a validation process based on experts' opinions, which was carried out by means of essential forms in Google Drive, where the assessment was required on suitability, relevance, and clarity of the questions posed (Mayorga, Gutierrez-Esteban & Suarez-Guerrero, 2018), with the purpose of knowing the vision and opinion of experts on the instruments and their applicability in the study. Subsequently, we proceeded to analyze the suggestions and timely revisions were made of both instruments. The guide, after the validation process, was extended to 34 indicators to see to the suggestions. Finally, there were final versions of these instruments implemented.

The answers from the interviews were transcribed and analyzed using a categorization and codification system for the information obtained with the qualitative data analysis software QDA Miner. This software allowed us to fragment the interviews per encrypted segments to analyze the information obtained. Creation of categories and subcategories was done as a function of the topics that arose in the interview during the codification.

As the participating observation was performed, based on the final indicators guide, there were 130 interventions analyzed within the selected community *(a community with 174 participants and 173 available resources)*. Presence and absence were assessed by means of evidence and answers, in addition open fields were included to obtain descriptive data.

For the semi-structured interviews of members of the VC, participants were contacted in person by means of private messages and their

participation in the studio was requested. After their acceptance, an email was sent with the initial interview script, so that they would be aware of the topic to be addressed in advance.

Chart 1 shows participants in the interviews: teachers from different educational stages, five women and six men, between 33 and 48 years of age, who –in half of the cases– have a more than eight years' teaching experience.
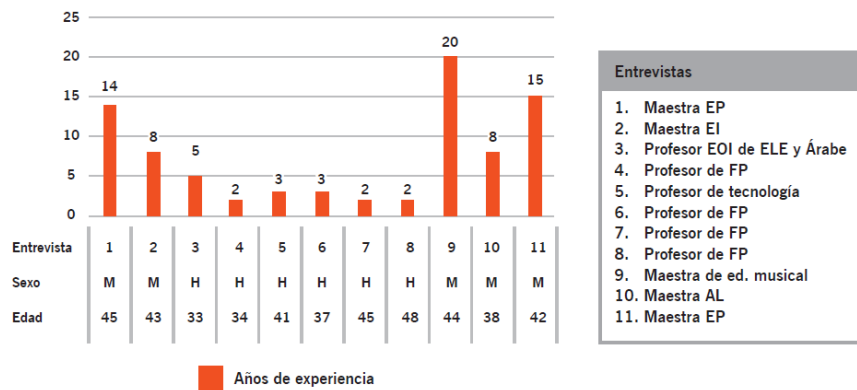
Chart 1. Summary of participants in the interviews.

In order to determine the reliability of the study, the contributions of Lincoln & Guba (1985) were considered in respect to the "*truth value*" criterion; that is to say, presence, at all times at the VCD of the researching team by observing the participant and how deep the interviews were, which allow us to recognize what the participants think and feel. Furthermore, a validation process has been done of the instruments employed, which provides authenticity and credibility to the study. Regarding applicability, sampling per convenience was done, where the sample has been selected because of how easy it is to access it.

RESULTS

Analysis of Pro-common VLC and OER offered thereby was done taking the indicators guideline prepared ad hoc into consideration. Evaluation of VLC and the OER thereof, was done in accordance with the presence/absence degree of these analysis indicators. In addition, open fields were included with the purpose of obtaining qualitative information (see table 2).

Table 2. Descriptive specifications after the Pro-common VLC analysis

Analysis indicators	Evidencie / responses
Community name	Commons: Open Educational Resources _ STEM
Main theme	REA Science, Technology, Engineering and Mathematics
Access	Registration is required
Profiles on social networks	YouTube, Twitter, Facebook and Pinterest
Roles of users	One administrator and the rest are CVD participants
Main language / others	YES: Spanish and co-official languages / NO: other languages
Recognition through badges	YES: users with badges for INTEF courses / NO: community
Main OER repositories used	Aggre2 Project, Procomun repository, Didactalia.net, http://www.matalasmates.es and CEDEC

Context of VLC: the main topic of this community includes the use of OER in STEM (*Science, Technology, Engineering and Mathematics).* This is a public VLC with over 150 members, although in order to take part herein, a simple registration is required. The role of each participant is the same (users), except for the administrator, who is a moderator and is part of the INTEF. No rules of use for the community are considered and the hosting website is adapted to all kinds of devices; furthermore, there is an app that may be downloaded. There are different analogous communities seen in the VLC search engine, as well as articles and external links related to its topic.

Tools/technical aspects about OER: OER, on the whole, may be amended and adapted as open-code resources. Installation steps and instructions are shown, elements of design and technical instructions for its correct use and application.

Curriculum and didactic application: content of VLC is divided per authors and members of the most popular community. In addition, organized labels per greater frequency of use are shown, especially related to the theme of VLC, that are related to the subjects, the course or the relevant level. Reference to instruction is also frequent, such as courses, projects, MOOC and NOOC that are taught from INTEF.

Concept about OER: participants in VLC share activities with OER for smooth implementation in the classroom, and with didactic guidelines where the objectives, contents, assessment criteria, learning standards and key competencies are specified, along with methodology and sequence. In addition, the participants show innovating projects, activities and experiences done in their educational centers.

Interactions between members of the community: the exchange degree of comments and interactions on the experience is done on a monthly basis.

It normally corresponds with tutored courses done at INTEF. OER exchange is constant and the feedback provided may be noted.

After the Pro-common VLC analysis by means of participant remarks, the interview is analyzed –already transcribed– and an encryption system for the information obtained is followed by means of a qualitative data analysis software (*QDA Miner*). This software has enabled fragmentation of interviews in coded segments per categories as may be seen in chart 2.

Legend:
- Educación abierta
- REA en la práctica docente
- Experiencias REA en un centro educativo
- Compartir y dar a conocer REA
- Razones y motivos de participación
- Conocimientos sobre otras comunidades
- Temáticas de la CVD
- Participación
- REA en la CVD
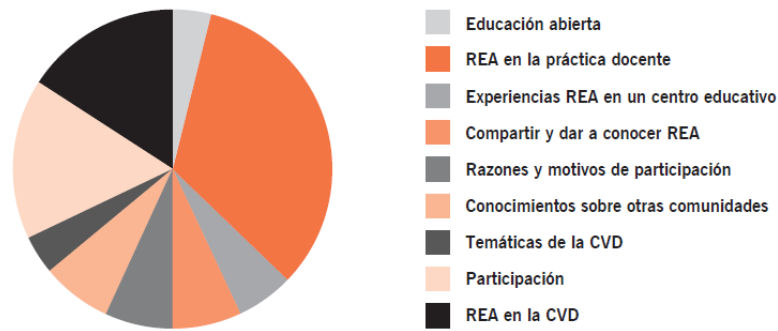
Chart 2. Segment percentage per categories.

Creation of categories and subcategories is produced as a function of the topics in the interviews during encryption. Once this process is done, nine categories and 21 subcategories are identified. Once the number of segments containing the categories (see chart 2) and subcategories (see chart 3) has been examined, interpretation of results is done.
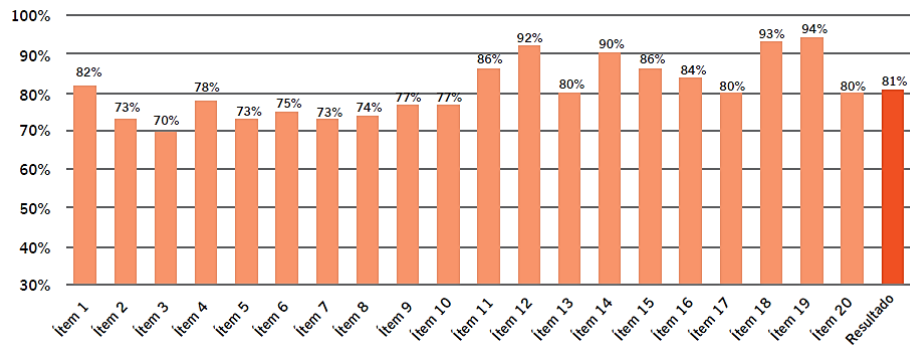

Chart 3. Number of segments per subcategories.

Below are identified categories related, as well as the most representative segments of what teachers argue in the interviews in respect to each of them.

Of the segments of the category of Reasons and Motives to participate in VLC, 80% refers to participation linked to permanent instruction, and 20% to voluntary participation in VLC. Participation is influenced by the development of online instruction courses developed by the administration, in this case, by INTEF.

> *Interview 1:* As I saw online options, I enrolled in the instruction course of INTEF and I began to be a Pro-common constant through this course.
>
> *Interview 4*: I enrolled in the virtual instruction course, managed by INTEF, where an essential requirement was the use of the Pro-common platform in some of the activities.

Knowledge about other learning VC: on the whole, teachers argue they have not participated in learning VC, but thanks to the courses of the administration they have become aware of what one of these communities is comprised of; even so, there are teachers who have previously participated in a VC.

> *Interview 10*: Before taking this course, I have not participated in other virtual communities. It is through this course that this option opens in my *training experience.*
>
> *Interview 2:* Yes, through the online mode, through the Center of Professors and Resources (CPR), in permanent instruction, I mean, it is always related to teaching courses.

Topics of the virtual teaching community: the topics that are mainly dealt with in the community are related to the development of instruction courses of INTEF (*ABN –learning based on projects– Scratch or healthy Schools*). Another more frequent issue is the use of OER, innovating experiences, training professors, sciences and the use of different methodologies.

> *Interview 1*. I have participated in Pro-common communities whose theme was learning based on projects, classroom laboratory activities, science and technology.
>
> Interv*iew 8:* Regarding Pro-common, I have participated in communities related to learning based on projects, in another community within Pro-common on healthy food at school and other on Scratch. There are varied topics, especially related to OER, the educational environment and teaching practice.

Participation: the intention is to become aware of the cooperation degree, therefore, it is necessary to identify what participation and interaction is done by members of the community. Participation usually is active when the instruction course of INTEF is in process. This usually is on a weekly or a monthly basis and the activity decreases when the course comes to an end or in holiday periods. There also are teachers who participate in a passive way with the purpose of gathering resources for their classes. Among the teachers interviewed, constructive criticism is noted towards

the kind of participation, since this is about a non-voluntary participation in some cases.

> *Interview 1*. We could say that my participation has been an active one as referred to instruction, that is, when the instruction course is implemented and we are asked to participate in the virtual community.

Furthermore, feedback is an essential part of a community, whether it is virtual or in the classroom. In this case, feedback in the community is frequent then the academic course is in progress, for its members interact when they have a common topic of interest.

> *Interview 9*: Yes, there is feedback when the academic course is in progress, it is a usual thing, except when a person you address does not answer because he/she is not an assiduous person to VLC.

OER in the Virtual Teaching Community: this follows the path done regarding the cooperation degree among participants, and it refers to sharing OER in the community. Interviewed teachers as a whole argue that OER are shared in the community (see chart 4), which become one of the main recurring topics among the members of the VC.
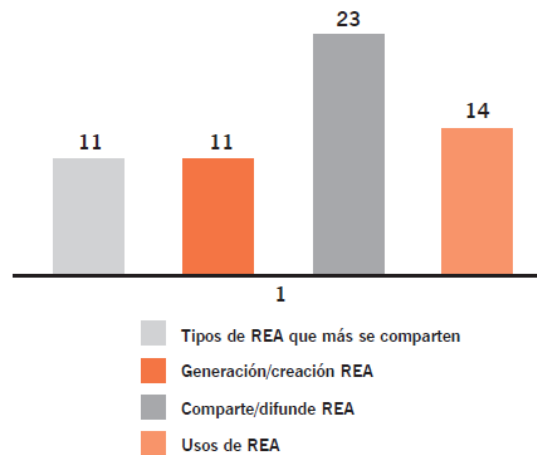
Chart 4. Segment distribution of the OER category in VLC.

With regards the type of OER shared in the virtual teaching community they partake in, there are those aimed to the use of educational materials for application in the classroom, in addition to examples of didactic units and sessions. Most of teachers argue that do not create OER, although they would like to have more information and training to create them.

> *Interview 1*. I work with videos, reinforcement and extension cards, projects, examples to prepare attractive and manipulative materials.

Sharing and disclosing OER: teachers were asked whether they disseminated OER in social networks. There were uneven answers, for there are teachers who do share OER in social networks, while others do

not, because using their profile is a personal thing, and there even were teachers who did not have social networks.

> *Interview 1. I* do not share social networks; the truth is that I use it as a personal profile.

> *Interview 11. Ye*s, although not so many OER, rather news, developments, activities and websites about education.

> *Interview 7.* Of course, this what it is about, I would say that if resources were not shared this would not be a community, as it would be a forum, or a blog and nothing more, this is the great difference from the virtual community.

Moreover, they were asked whether they had a blog or a website where they shared OER and, again, there were different answers: there are teachers who do not have these spaces, but they would like to have them; and there are teachers who even have apps, wikis and a blog, and they make use of them to share OER.

OER experiences in educational centers: it is important to know the participation in activities and projects performed both in the school center where interviewed teachers work and in other nearby centers. In this case, there are no intimately related projects with the use of OER at the centers where the interviewees work, although they do know about projects in other educational centers thanks to the virtual community where they participate.

OER in the teaching practice: there were questions about the experience with OER in the classroom, their application, technical aspects and knowledge about the students' opinions (see chart 5). For this, they were asked about the benefits for their classes when they used OER, their experiences in their professional teaching career with OER and the features they highlight of these resources.
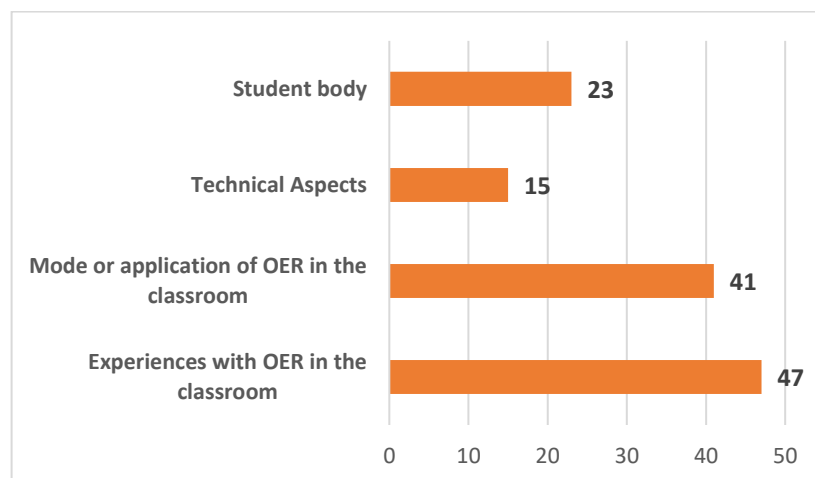

Chart 5. Segment distribution of the OER category in the teaching practice.

Regarding the improvements found during the development of classes using OER, most of them have found and increase of the students' interest. Therefore, experience with and contact with OER are valued in a positive way. Interviewed teachers disclose, among challenges to be taken up, the need for prior didactic programming to work with these resources, as well as a selection that would adapt to available means and to students' profile they work with. Mostly used devices are: portable computers, interactive digital board, tablets and, to a lesser extent, smart phones. Among the difficulties they encounter when carrying out a session or when performing an activity with OER, there are difficulties of technical type –specifically, poor internet connection and likely device failures.

> Interview 8: Well, you have to be prepared. It is not the same to have a text book and get to work than having to handle portables, PDI, tablets. There is a lot of planning to be done.

Teachers do not know whether their students partake in VLC, although they acknowledge that this is not common, above all in the primary education stage. They say that they are aware of the use of social networks and instant messaging, as a frequent and usual activity of students.

When teachers are asked about what they see in their students in the development of a session with OER, the main notes and comments refer to an improved interest by students and more motivation developed.

> Interview 6: They think teaching is more attractive.

> Interview 7: They get used to the new way of work from the beginning.

Open education: they were asked "do you think that using OER fosters a more flexible and open teaching process?" with the purpose of getting a more personal vision on this aspect, in search for a reflection from teachers from a professional vision. On the whole, answers were in the affirmative, for they think that using OER fosters open and flexible learning. Among the most notable opinions is the following:

> *Interview 3:* At home, they could extend, analyze, investigate a lot more than in the class, this would be transferring learning to every place without having to depend on a schedule or a specific classroom.

In summary, bringing OER to VLC has been consolidated and enables the existence of open and flexible instructional processes among teaching groups, which sets up cooperation relations and brings these free-access resources to the classroom.

DISCUSSION AND CONCLUSIONS

The participation dynamics in virtual communities and the construction of a teaching identity, as well as design, use and assessment of OER comprise the object of study of current educational technology, which are to be submitted to new and better methods. This work, which is centered in analyzing how and why OER are employed in a VLC, only is an approximation to the appropriation process –each time more complex–

not only because of its technological nature, but because the manner teachers perform and the reasons to do so depend on a number of variables.

Pedagogic representation of the use of technology is a variable claiming how inexorable it is to the educational meaning (Suarez-Guerrero, Lloret-Catala & Mengual-Andres, 2016). Considering the pedagogic variable in the study of technology in education could contribute to overcome the bias towards centered research in artifacts and their effects, and to consider another one that would go for the understanding of policies, subjectivities and practices aimed to build a digital educational praxis (Area, Miño, Rivera-Vargas & Alonso, 2020). This work is in this second option.

As inferred from the results, it is possible to talk of a difficulty of professors to define the concept of OER, which gives rise to a controversy of terms. The mostly shared OER types are: videos, interactive applications, online presentations, computer graphics, examples of didactic units and classroom sessions. These resources are taken to the classroom for their teaching practices, which has turned into a daily issue.

In addition, it is seen that there is no generalized use of OER by the teachers, although they have begun to become accustomed to them and to manage computer tools for the creation thereof. Teachers share and disseminate OER in the community where they interact, especially in blogs and educational websites, which leaves social networks for the personal environment.

School projects where they supply examples on how to use OER are each time bigger, especially through the Pro-common community, where other projects are mentioned, such as Gauss, Scratch, eScholarium, Flipped Classroom and EDIA Project. In turn, the most frequent topics in the Pro-common VLC are related with teaching instruction courses, although divers topics arise in the communities linked to subjects or specific areas.

Both for the Pro-common community and for other VLC, the question made by Escamez (2018) could be extended on the willingness of teachers to go for new ways of teaching and learning, outside the comfort zone and, therefore, to make students accompany this process of change as well. That is, using resources like lodging in VLC does not only pose a technical exercise, but also a professional and social practice, a change in the way of thinking, feeling and doing with technology. This underlines a change in the pedagogic culture, towards a culture that would recognize an open way of working, in addition to manners of partaking that would overcome standard or formal instruction (Lopez & Bernal, 2016). These changes outweigh the digital adjective and revolve around new teaching roles.

By partaking in VC, teachers perceive that their participation is influenced by educational administrations and it is linked to permanent instruction of teachers. This, along with new instruction proposals –such as VLC and the use of OER– have begun to supersede previous educational formats about how a teacher developed his/her skills, like massive and cascade

courses. Similarly, the participation of teachers during the school term is an active one and decreases in holiday or vacation periods.

Contributions and feedback produced in these spaces are accompanied with activities related to the topics of courses, where OER are shared along with guidelines and didactic units to incorporate them in the syllabus, as well as examples of sessions to be developed in the classroom. This trend is in tune with the idea of Mura, Domingo & Cacheiro (2015) regarding the exchange of experiences and resources by way of collaboration as the main activity of a VC.

Regarding previous experience in VC, teachers mention experiences in communities linked to their personal interests and hobbies, with a less professional or institutionalized character. In this sense, they consider that in the students' case, previous experience regarding communities is not so extensive as is the case of social networks (especially with respect to instant messaging applications). For this reason, it is important to state the differences and the need for study, in the face of teachers' instruction, between what it means to belong to a VC and to be the node of a social network.

To sum up. The educational use of OER and the participation of teachers in virtual communities are opening avenues, traits and conventions in the exercise of open and flexible education (Suarez, Guerrero & Gutierrez-Estaban, 2018). This is not about a technological turnaround but about an extended culture which, as has been shown by the Covid-19 pandemic (Williamson, Eynon & Potter, 2020), does not depend on the substitution of one tool for another, but on the creation of new, open and collaborative, learning environments, on educational scenarios that would take advantage of digitalization, and which have a meaning for the daily life of and the professional life of teachers.

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