System of actions to prepare teachers for the creation of open educational resources

Maida Librada Bilbao Consuegra
Universidad Central "Marta Abreu" de Las Villas, Cuba.
Email: maidabc@uclv.cu,
ORCID: https://orcid.org/0000-0001-6137-3810

Nancy Andreu Gómez
Universidad Central "Marta Abreu" de Las Villas, Cuba.
Email: nancya@uclv.cu,
ORCID: https://orcid.org/0000-0002-2577-1114

ABSTRACT
The Ministry of Higher Education has made the creation of massive open online courses (MOOCs) in universities as a key objective in part of the digital transformation of Cuban universities. This has led to a need to prepare teachers and managers to face open education. Open educational resources (OER) promote the opening and democratization of knowledge and expand the opportunities for access to information. It is necessary for higher education centers to develop and manage resources to support the teaching–learning process and to prepare their teachers in the production of these resources. The objective of this paper is to present the results of the Virtual Learning and Distance Education Group of the Universidad Central "Marta Abreu" de Las Villas in the work with the preparation of teachers to face open education. Specifically, the paper will focus on the actions taken to prepare teachers for the creation of OER. The results shown were obtained using the systematization of experiences as an essential method of qualitative research. A comprehensive system of strategic actions has been developed and implemented across various domains, with the objective of preparing teachers to engage with open education, particularly as creators of OER. Work stages have been delineated to facilitate the transition to open education and the development of OER by teachers.

Keywords: open education, MOOCs, teacher preparation, open educational resources

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1. INTRODUCTION

In recent decades, in the international context, a series of educational practices have been presented that have in common the development of new pedagogical trends that encourage not only methodological novelty but also access to education and educational resources as ways to achieve sustainable development. In response to educational needs, the open access movement (Ortega, 2016) arises to counteract the high prices of textbooks and scientific journals that limit access to information in both developed and developing countries.

Open educational practices are defined as activities that support the use, reuse, and production of open educational resources (OER) through institutional policies, promotion of innovative pedagogical models, and the empowerment of students as co-producers of their lifelong learning (OPAL, 2011). Open educational resources promote the opening and democratization of knowledge and expand opportunities for access to information. It is necessary for higher education centers to develop and manage resources to support the teaching and learning process, which can be used, shared, distributed, and reused by all teachers (Trujillo Sainz, 2020).

In 2002, the term OER was used for the first time at a UNESCO conference; in 2005, a study was launched to analyze the scope of OER. In 2007, a report was published with the results of the study; in 2008, governments were urged to finance the production of OER in what was called the "Cape Town Open Education Declaration." The most commonly used definition of OER currently used by UNESCO is "digitized materials offered freely and openly for teachers, students, and self-learners to use and reuse in teaching, learning, and research" (UNESCO, 2019).

The UN establishes a series of recommendations on OER, such as:

- Capacity building of stakeholders in the creation, access, reuse, adaptation, and redistribution of OER.
- Development of support policies.
- Promotion of effective, inclusive, and equitable access to quality OER.
- Encouraging the creation of sustainability models for OER.
- Promotion and strengthening of international cooperation.

The purpose of this paper is to focus on the development of capacities and skills in teachers regarding the creation, access, reuse, adaptation, and redistribution of OER. The need to create awareness and skills to use OER, to recognize how OER can increase access, and to improve learning outcomes and empower students to become co-creators of knowledge is expressed. In addition, the need to sensitize teachers to the exceptions and limitations for the use of copyrighted works and to prepare teachers for some of these aspects in a gradual manner in the different stages of the research is also expressed.

Among OER, the most widely used courses in recent years have been MOOCs. Their impact on online training has experienced a significant boom. A MOOC simplifies distance learning due to its characteristics: open, collaborative, massive, and free. Its structure is designed to promote student learning, as it has objectives and components within a set of learning areas or specific topics, with numerous resources in the form of videos, links, documents, and spaces for discussion and communication, presenting various forms of evaluation, as well as certification of what has been learned.

The purpose of this paper is to present the results of the Virtual Learning and Distance Education Group of the Universidad Central "Marta Abreu" de Las Villas (UCLV) in the work with the preparation of teachers to face open education. Specifically, the paper will focus on the actions taken to prepare teachers for the creation of OER. These actions were implemented through strategic actions in different directions of work. The results shown were obtained using systematization as an essential method of qualitative research.

2. METHODOLOGY

The dynamics of higher education, regardless of the modality and level, demand the constant exploration of contexts and subjects to achieve detailed descriptions of any new learning experience intended to be established. The dynamics explain the reality, the actions, and their effects. This requirement invites educational agents to "observe" and "follow" the referenced practices (Restrepo & Tabares, 2000). This observation and monitoring of the educational reality is a complex process that responds to strategies previously defined for this purpose; one of them

is the systematization of experiences (Barbosa-Chacón et al., 2010).

The systematization of experiences is assumed, according to the proposal (Van de Velde, 2008), with its respective adaptations to the specific context in which the research is developed and which takes up (Jara, 1994). The systematization of experiences alludes to the ordering of information and critical interpretation of the process developed, in order to identify "significant learning that should be communicated and shared to nurture one's own experience or to inspire others in a transformative perspective" (Jara, 2016, p. 47).

A process of systematization of the experiences lived in the preparation of teachers was carried out by organizing and reconstructing them chronologically, and the following stages were defined:

- First stage (2015–2018): Preparation of teachers for the creation of virtual classrooms on the Moodle platform.
- Second stage (2019–2021): First actions in the preparation of teachers in open education and OER.
- Third stage (2022–present): Creation of MOOCs to prepare teachers for the creation of OER.

3. DEVELOPMENT

3.1. First stage (2015–2018): Preparation of teachers for the creation of virtual classrooms on the Moodle platform

From the integration of the universities in 2015, the Department of Educational Technology began to reside at the headquarters of the UCLV. A number of shortcomings were diagnosed related to the development of practical

skills in the management of the Moodle platform and especially, problems with the didactics to apply this learning in the teaching–learning process that was developed in a face-to-face manner.

Among the inadequacies detected are as follows:

- The virtual classroom is mainly used to place folders with documents that students must consult, which turns it into an information repository.
- Large number of empty courses.
- Existing courses have not incorporated the potential of interactive platforms for learning assessment.
- Poor access of teachers and students to the courses.

We set ourselves the task of designing a postgraduate course and contextualizing it to the demands of university faculty preparation. In 2015, the first edition of the postgraduate course began in person. From 2015 to the beginning of 2018, the postgraduate program has been improved year by year, and 16 postgraduate courses have been offered. Annually, two postgraduate courses are offered to the university (one in each semester), in addition to particular requests from areas or departments.

This postgraduate course prepares teachers under the principle of the unity of didactic and technological aspects, and at the end of the course, the teacher is able to create a virtual classroom on the Moodle platform, both as a support for face-to-face teaching and for distance learning. Although this stage does not include content related to OER, it is considered a prior and necessary step in the training of teachers to be able to face the process of open education and the creation of MOOCs and other OER in the future. It is necessary to know the technical and methodological potential of interactive platforms for the design

of an open and online course.

As a final result of this stage, the following are obtained:

- The preparation of a good number of teachers in the Moodle platform and in the design of virtual classrooms.
- A discreet increase in the quality of the virtual classrooms of the UCLV.

3.2. Second stage (2019–2021): First actions in the preparation of teachers in open education and OER

At this stage, the study of the theoretical bases of open education and OER begins as an indispensable step for the incorporation of these contents into the postgraduate courses taught by the Department of Educational Technology. As part of the tasks assigned by the VLIR project (project 3: ELINF) and by the National Center for Distance Education (CENED), Cuban universities must initiate a path toward open education, which will promote the international visibility of the science that is produced and may constitute a source of income.

At this stage, a period of sensitization of teachers and directors about the need to move toward open education practices began, and actions were started to be taken to bring them closer to the subject and to provide them with a basic knowledge of its theoretical and legal bases.

As a first action at this stage, two members of project 3: ELINF, who are also part of the Virtual Learning and Education Group on MOOCs and OER, received training. As a result of the training, the participating teachers participate in the collective assembly of an open course on the platform of the University of Holguin on MOOCs design in the context of Cuban education. All of the above allows

the incorporation of a topic of open education and OER, as part of the subject Educational Informatics of the Master's Degree in Educational Sciences.

A topic on open education and creation of MOOCs is incorporated into the postgraduate course "The Creation of Virtual Classrooms in Higher Education." For the delivery of the same, a video is created where the principles of open education and the fundamental characteristics of MOOCs are stated. The evaluation of this topic was carried out through a discussion forum where the participants expressed their criteria on open education and its possibilities of implementation in Cuban education. In parallel, methodological activities on the bases of open education and the creation of MOOCs are taught.

The main results of this stage are as follows:

- Preparation of teachers of the Department of Educational Technology in aspects related to open education.
- The sensitization of teachers and managers regarding the principles of open education and the creation of OER begins through methodological work.
- The preparation of university teachers for the creation of MOOCs based on the potential of the Moodle platform begins, starting with graduate courses.

3.3. Third stage (2022–present): Creation of MOOCs to prepare teachers for the creation of OER

As progress was made in preparing teachers for the virtualization of learning and in developing digital competencies for working with interactive platforms, new needs arose that were imposed by the new times. In particular, the open education movement was strengthened, and within this, the

goal was to turn the teacher into a producer of OER. On the other hand, the Ministry of Higher Education made the creation of MOOCs in the country's universities an essential objective and was established as a quality indicator to measure the digital transformation process in these institutions.

As members of the VLIR project (project 3: ELINF), we were assigned new tasks to implement open education within the project. Thus, an integrated work is carried out between the Directorate of Scientific and Technical Information and the Directorate of Educational Technology to prepare professors of the five participating universities (UCLV, University of Informatics Sciences, University of Camagüey, University of Pinar del Río, and University of Holguín) in this topic.

After conducting a series of work sessions in an integrated manner, the result is the design of a MOOC entitled "Open Science and Education in Higher Education." Among the most outstanding features of this course is the use of videos with open licenses and activities in HTML5 Package (H5P) considered as OER.

This MOOC was structured in the following nine topics:

1. Topic 1: Science and open education. Foundations, definitions, current trends, and legal basis.
2. Topic 2: Copyright in open environments. Licenses for the development and use of resources in open science and open education.
3. Topic 3: OER, types, and characteristics. MOOCs.
4. Topic 4: Interactive quizzes in MOOCs for learning assessment.
5. Topic 5: The teacher as producer of OER. Free software for design.

6. Topic 6: Open science. Open research.
7. Topic 7: Research data management.
8. Topic 8: Publishing in open access: Preprints and open access journals.
9. Topic 9: Open science evaluation. Alternative metrics. Open peer review.

The course was hosted on the RedTIC platform, part of the VLIR project, available at https://moodle.vlired.cu/course/view.php?id=56. The course lasted two months, began in April 2022, and was attended by more than 190 teachers from the five universities involved and other institutions in the provinces where these universities are located. The culmination of this course was a virtual workshop with the participation of the project leaders.

Another determining factor for the establishment of this new stage was the need to prepare teachers to create interactive activities on open-source platforms that could be used on other platforms due to their interoperable nature. In addition, many teachers demanded the production of videos for national and international events.

For this reason, it was decided to design a second MOOC oriented to the production of OER, with two essential directions. The first of these directions was aimed at preparing teachers for the creation of interactive activities in H5P and the second direction toward the production of videos in open-source platforms.

Work with H5P was selected because this interoperable package allows educators to create diverse and highly engaging content such as electronic presentations, quizzes, interactive videos, and many others. At present, developers from various countries around the world have managed to

create more than 30 types of activities of this type, which are available on the https://h5p.org/ website.

These activities are studied and it is decided to select those most frequently used in the different areas of knowledge, so 15 types of activities are incorporated into the course. The second direction of the MOOC was oriented toward the production of videos with open-source software. One of the resources that in recent years has had an accelerated growth in the design of MOOCs is video, which has proved to be a very successful means for the student to learn autonomously.

Video has turned out to be a didactic medium par excellence because it can be used to explain, illustrate, and demonstrate a phenomenon, object, or process in a way that is very close to reality. When a video is used, the student can advance or stop at a personalized pace depending on his or her needs, and this makes it a very practical means of self-management of knowledge. However, many teachers would like to be able to produce their own videos to teach at a distance, but they do not master these programs. For this reason, these topics are incorporated into the MOOC, which requires a study of the most widely used open-source programs for screen capture and video editing.

After a thorough search to prepare teachers for open-source video production programs that could be easily downloaded from the Internet, it was difficult to find those that integrated capturing and editing. Those that managed to do both functions mostly exported the videos with watermarks and, on other occasions, did not have a simple or intuitive interface for a teacher who is not a specialist in audiovisual productions. That is why it was decided to offer two programs that complement the process: OBS

Studio for capturing screens and OpenShot for editing. All videos used in this course have open licenses.

At the end of the MOOC design stage, the MOOC was structured in nine topics:

1. Topic 1: OER. MOOCs.
2. Topic 2: Introduction to H5P. Some typologies of questions with text in H5P: word completion, word marking, and word trailing.
3. Topic 3: Some typologies of questions with images in H5P: interactive image, find a hot spot, and find multiple hot spots.
4. Topic 4: Some typologies of questions in H5P. The exam, drag and drop on images, text sorting, and image sorting.
5. Topic 5: Integrative resources in H5P: presentation with slides and interactive video.
6. Topic 6: Integrating resources in H5P: the column and the interactive book.
7. Topic 7: Integrative resources in H5P: The decision scenario in H5P.
8. Topic 8: Screen capture with OBS Studio.
9. Topic 9: Editing videos with OpenShot.

This course was held between February and June 2023 and concluded with a total of 34 participants, including 17 from other institutions in the country. As a result, each participating teacher developed around 12 OER in H5P that can be used in the virtual classrooms of their subjects. At the end of the meeting, a five-question survey on satisfaction and expectations was conducted. It was found that 91.17% considered themselves *very satisfied*, 8.82% were

moderately satisfied, and no value was placed in the satisfied or dissatisfied criteria.

When asked how they self-assessed themselves on a level of 1 to 10 on the knowledge and skills acquired, it was found that 88.23% self-assessed themselves between the values of 8 and 10 and 11.76% between the values of 6 and 7. No student self-assessed themselves below these levels. Both qualitative and quantitative results can be found at https://aula.uclv.edu.cu/mod/feedback/analysis.php?id=3130. This MOOC is proposed to be part of the UCLV summer school.

The results of this stage are as follows:

- A MOOC on open education and open science is available on the RedTIC platform.
- A MOOC on the production of OER for the virtualization of learning is available on the university's graduate platform.
- A first group of teachers from both UCLV and other universities are prepared to create MOOCs and OER in H5P.
- A system of openly licensed videos and activities in H5P is considered OER.
- A course on OER production in H5P, mounted on the Nectar platform, is ready to be marketed through the SICTE technological interface.

4. CONCLUSIONS

The Directorate of Educational Technology of the UCLV has carried out a set of strategic actions aimed at preparing teachers for the production of OER in response

to the requirements of the Ministry of Higher Education and as part of the digital transformation of Cuban universities. From 2015 to date, work stages have been established, which in an organized manner and through the systematization of experiences, and have directed the work toward the transition to open education and the creation of OER. Today, courses are available on the graduate platform, which allow for the preparation of teachers in the creation of OER. At this moment, there is already a group of teachers, both from UCLV and from other universities, prepared to create MOOCs and OER in H5P.

REFERENCES

Barbosa-Chacón, J. W., Barbosa Herrera, J. C., Marciales Vivas, G. P., & Castañeda-Peña, H. (2010). Reconceptualization of informational competencies. An experience in higher education. *Revista de Estudios Sociales*, *37*, 121–142.

Jara, H. O. (2016). The systematization of experiences: New routes for academic work in universities. In *Sistematización de prácticas y experiencias educativas*. Alcaldía de Medellín. https://abacoenred.com/wp-content/uploads/2021/04/Sabemos_mas_de_lo_que_sabemos_sistematiz.pdf

Jara, H. O. (1994). To systematize experiences. *Revista Iberoamericana de Educación a Distancia*, *21*(2), 83–95.

OPAL. (2011). *The OPAL report 2011 "Beyond OER: Shifting focus to open educational practices."* The Open Educational Quality Initiative. http://oer-quality.org

Ortega, N. V. (2016). Recursos Educativos Abiertos. *Revista Mexicana de Bachillerato a Distancia*, *8*(18).

Restrepo, M. M., & Tabares, I. L. (2000). Research methods in education. *Revista de Ciencias Humanas* , *21*. http://www.utp.edu.co/~chumanas/revistas/revistas/rev21/restrepo.htm

Trujillo Sainz, J. (2020). Methodology for the organization of open educational resources in the career of labor education-

informatics. *MENDIVE, 18*(1), 102–115. http://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/1672

UNESCO. (2019). *Open educational resources*. https://es.unesco.org/themes/tic-educacion/rea

Van de Velde, H. (2008). *The systematization of educational experiences: A space for critical reflection and transformation of practice*. Managua, Nicaragua.