

Opening the horizons for education: reflections on repositories of open educational resources in higher education

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Abstract: The repositories of open educational resources have been expanding in various regions of the world, which leads to the need to reflect on the role of these repositories and their implications for teaching and research in higher education, which is the objective of this study. The qualitative exploratory research was adopted as a methodological approach, to compose the literature review on the phenomenon under study, seeking to support the discussions around it. Bibliographic searches in the Scopus and Web of Science databases were used as search strategies for data collection and analysis. According to the results obtained, it became evident that open educational resources and repositories, as sources of management and dissemination of the resources, brought a new perspective to education, in the sense of openness to access, reuse, and sharing and to encourage collaborative work to adapt, transform and create new content. However, there is a need to broaden the understanding of the limitations and barriers to the sustainability and utilization of open education resource repositories and how they can contribute to innovative practices in teaching and learning, from the perspective of the users of these systems, which requires further studies with this objective.

Keywords: open education; open educational resources; open educational resource repository; higher education

1 Introduction

As a means of scientific dissemination, repositories guarantee access to the documentary memory of knowledge, experiences and products generated in the institutions. With this, it allows the construction of knowledge from content produced and registered.

In the view of Duperet Cabrera *et al.* (2015), repositories are information systems that, in addition to preserving and organizing scientific and academic materials, guarantee access to information. Afonso *et al.* (2011), who conceptualize digital repositories as information systems that allow controlling the production, dissemination and access to information, also share this view.

The repositories have been built, mainly, for preserving the institution's intellectual heritage, with the possibility of free access, safeguarding copyright.

In academic institutions, repositories provide access to educational content produced by teachers, thus collaborating for the teaching and learning process and research development.

Aiming at the reuse and sharing of these contents, the production of educational resources has taken into consideration the adoption of types of license of use more flexible than copyright, being “creative commons” a type of open licensing commonly adopted to allow adaptations, reviews, combinations of these teaching materials, expanding its application in multiple contexts.

Litto (2006) draws attention to the fact that open educational resources must be developed collaboratively, always seeking to improve and enhance learning objects. In addition, the reuse of these resources minimizes duplication of efforts for teachers, in view of the existence of teaching materials that can be used and adapted in their educational practices and also represents savings for institutions (Currier *et al.*, 2004).

In this process of collective creation, the collaborative spirit and the exchange of knowledge are sharpened to produce educational resources that contribute to innovative teaching practices.

There are several types of teaching resources on the internet that can assist teachers and students in their teaching and learning processes (Litto, 2006). However, the quality and accessibility of these resources are questionable, which

means that for users, it is not an easy task to find teaching resources that suit their learning and teaching needs. The repositories in turn, would be the tool for the management, preservation, dissemination and access to these educational contents, providing the means for the search of quality educational resources that meet the search strategies of repository users. However, there are often isolated actions to bring together the content produced by teachers in the teaching process, on websites and/or internal databases, which are not organized and made available in repositories that can guarantee access and dissemination of the produced knowledge, through search and retrieval strategies for stored information.

Therefore, the aim of this study is to reflect, based on a literature review, on the role of open educational resource repositories from the perspective of users of these systems and their implications for teaching and research in higher education.

The present article is structured in five sections, starting with the introduction, which presents a brief contextualization of the study scenario and the objective, followed by the methodology with the discrimination of the research procedures. In subsequent sections, the results obtained through the literature review are discussed and, finally, the final considerations are presented.

2 Methodology

For this study, it was adopted qualitative exploratory research as a methodological approach, to compose the literature review on open educational resource repositories, seeking to support the discussions around this element.

With this objective, bibliographic searches were carried out in 2022 on the Scopus and Web of Science (WoS) databases, to retrieve articles that mirror the proposal of this study, with emphasis on the scientific production that was published in the last 12 years, although not a time frame for filtering the results has been proposed at the beginning of the searches in the aforementioned databases.

In these sources of information, the search terms were used: “Open Educational Resources” (OER), “learning objects”, “higher education”, repositories, “institutional repositories”, “learning object repositories”, “open

educational resources repositories”. For the combination of these terms in the search strategies, the Boolean operators OR and AND were used (Table 1). In addition, the search for articles from journals and proceedings it was used as a research delimiter.

Table 1 - Developing the search strategies on the Scopus and Web of Science databases

Query String	Databases	Results Article	Proceeding paper	Total
“OPEN EDUCATIONAL RE-SOURCES” AND “HIGHER EDUCATION” AND REPOSITORIES	WoS	22	26	48
	Scopus	452	151	603
(“OPEN EDUCATIONAL RE-SOURCES” OR “LEARNING OBJECTS”) AND REPOSITORIES AND “HIGHER EDUCATION”	WoS	28	49	77
	Scopus	929	424	1353
(“LEARNING OBJECT REPOSITORIES” OR “OPEN EDUCATIONAL RESOURCES REPOSITORIES”) AND “HIGHER EDUCATION”	WoS	03	03	06
	Scopus	329	175	504
(OER OR “OPEN EDUCATIONAL RESOURCES”) AND REPOSITORIES	WoS	113	128	241
	Scopus	799	365	1164
(“OPEN EDUCATIONAL RE-SOURCES” OR “LEARNING OBJECTS”) AND “INSTITUTIONAL REPOSITORIES”	WoS	17	09	26
	Scopus	202	63	265

Source: Research data.

Based on the results found, the abstract was read for the pre-selection of articles. Having overcome this phase, ease of access to the full text and its relevance were considered, according to the purpose of this article. Chart 1 shows the 30 articles that were selected for the content analysis phase.

Chart 1 - Articles selected for content analysis

Author	Title	Year	Source type	Database
Davis, HC <i>et al.</i>	Bootstrapping a culture of sharing to facilitate open educational resources	2010	Journal	WoS Scopus
Krämer, BJ. and Klebl, M	Open educational resources and the repository network edu-sharing	2011	Proceedings	WoS Scopus
Becker, P	Dutch repository for open educational resources in software engineering: Does Downes' description fit?	2012	Proceedings	WoS Scopus
Dichev, C and Dicheva, D	Is it time to change the OER repositories role?	2012	Proceedings	Scopus
Sánchez González, M	Open access as a way towards a university more adapted to the digital culture context: trends and experience in the Spanish case	2012	Journal	Scopus
Yacinalp, S and Emiroglu, B	Through efficient use of LORs: prospective teachers' views on operational aspects of learning object repositories	2012	Journal	Scopus
Hannon, J <i>et al.</i>	Accessible, Reusable and participatory: Initiating open education practices	2013	Proceedings	Scopus
Marcus-Quinn, A and Diggins, Y	Open educational resources	2013	Journal	WoS
Atenas, J and Havemann, L	Questions of quality in repositories of open educational resources: a literature review.	2014	Journal	Scopus
Minguillón Alfonso, J. <i>et al.</i>	Why do teachers (not) use the institutional repository?	2014	Proceedings	WoS
Sancho Vinuesa, T <i>et al.</i>	Higher education academic staff: Professional identity and sense of community as the key to enhancing teaching quality the culture of sharing educational resources in the catalan university system.	2014	Proceedings	Scopus
Valladares Rodríguez, S <i>et al.</i>	The impact of open educational resources in teacher activities. A perception survey	2014	Proceedings	WoS
Zervas, P, Alifragkis, C and Sampson, DG	A quantitative analysis of learning object repositories as knowledge management systems.	2014	Journal	Scopus
Guedes, JT, Gonçalves, HA and Nascimento, MBC	Reframing the Educational Practice from the perspective of Open Educational Resources	2015	Journal	WoS
Xu, H	Factors affecting faculty use of learning object repositories	2015	Journal	Scopus
Goodsett, M, Loomis, B and Miles, M	Learning campus OER initiatives through library-faculty collaboration	2016	Journal	Scopus

Navarrete, R, Luján-Mora, S and Peñafiel, M	Use of open educational resources in E-learning for higher education	2016	Proceedings	Scopus
Romero Peláez, AE and Morocho Yunga, JC	Intrinsic features for accessible OER	2016	Journal	Scopus
Xu, H.	Faculty use of a learning object repository in higher education	2016	Journal	Scopus
Ferguson, CL	Open educational resources and institutional repositories	2017	Journal	WoS Scopus
Hakim, S	Supporting access to open education resources and massive open online courses for high school students of New Zealand	2017	Journal	Scopus
Heredia, JM, Rodrigues, RS and Vieira, EMF	Scientific production about open educational resources	2017	Journal	WoS Scopus
José, AC and González Hernández, W	Methodology to implementation of a repository of learning objects during the teaching of analytical geometry in the mathematical career of the Higher Institute of Education Sciences of Sumbe	2017	Journal	Scopus
Mora Rivera, S and Coto Chotto, M	Contributing to the OER movement: A practical experience: The case of the Informatics School, UNA	2017	Proceedings	WoS Scopus
Wong, BTM and Li, KC	Using open educational resources for teaching in higher education: a review of case studies	2019	Proceedings	WoS
Otto, D	How to promote the use of open educational resources (OER) in higher education. A parley with OER experienced teachers	2021	Journal	WoS Scopus
Vrana, R	Open educational resources (OER) as means of promotion of open education	2021	Proceedings	Scopus
Truong, V, Denison, T and Stracke, CM	Developing institutional open educational resource repositories in Vietnam: opportunities and challenges	2021	Journal	WoS Scopus
Hutson, J <i>et al.</i>	Open educational resources and institutional repositories: roles, challenges, and opportunities for libraries	2022	Journal	Scopus
Perifanou, M. and Economides, AA	Measuring quality, popularity demand and usage of repositories of open educational resources (ROER): a study on thirteen popular ROER	2022	Journal	WoS Scopus

Source: Research data.

The content analysis process of the selected articles considered the following procedures, according to Flick (2013):

- a) selection of the most important parts of the research material;
- b) grouping and summary of similar parts;
- c) proposal of types of formal structures or category systems for analyzing the content of the research material.

3 Analysis and discussions of the results

The analysis was developed considering 3 categories and 15 subcategories, which guided the discussions presented in the following sections, as shown in Chart 2.

Chart 2 - Proposal of categories e subcategories of analysis

Categories	Subcategories
Open Educational Resources	Characteristics Production and dissemination Intellectual property/use licenses Factors influencing use Sharing and reuse
Open Educational Resources Repositories	Characteristics Infrastructure Metadata Interoperability Quality standards Licenses Web 2.0 tools Usability
Open Educational Resources Repositories in Higher Education	Difficulties in implementation Barriers to use

Source: Prepared by the authors.

3.1 Open educational resources

According to the World Congress on Open Educational Resources (2012), open educational resources are teaching, learning and research materials that are in the public domain or have few usage restrictions. Therefore, they can be used in their original form, adapted or revised, in addition to creating something new from the combination of the original material or revised with another (Zanin, 2017).

The discussion on open educational resources has expanded on the international scene as shown by the growth in scientific production on OER since 2008, constituting an object of interdisciplinary study, with a large concentration of publications in journals in the area of Education, in addition to Engineering, Computer Science, Information Science and other areas (Heredia; Rodrigues; Vieira, 2017).

However, the adoption and dissemination of open educational resources in Brazil are still not very significant (Ferreira; Carvalho, 2018), with the opposite being seen in countries such as the United Kingdom, United States, Spain and Canada (Heredia; Rodrigues; Vieira, 2017). Asian countries, such as China and Korea, have stood out as major producers of OER. Production has also increased in countries like Indonesia and South Africa (Hakim, 2017).

The term open educational resources encompasses a broad category of content, from support tools for learning, learning objects of various types, materials and course content (Becker, 2012; Krämer; Kleib, 2011) and encompass several possibilities of use, from complete courses to smaller units, such as modules, videos, tests, software, podcasts, multimedia resources, among others (Romero Peláez; Morochó Yunga, 2016).

The possibility of customizing OER, given its modular nature, allows users to use only components or parts of the resources that they deem relevant to their educational objectives. This allows teachers to select elements from several OER to create a resource adaptable to the needs of a course, as these resources adopt a type of open use license (Ferguson, 2017).

Due to their characteristics, OERs tend to motivate teachers to reuse and recombine educational materials produced by other educators, while leading them to rethink their educational practices and encourage collaboration in the academic environment.

OER cover diverse knowledge and dynamic content, going beyond traditional textbooks and are included in the broader context of open education, which also includes open technologies and teaching practices, as well as collaborative learning. They can be adapted and revised, according to the use licenses adopted, thus improving their quality and extending their use in other contexts. They also represent the optimized use of resources, since OER can be shared and reused. Public investments used in the production of OER should be converted into sharing and reuse of these resources at no cost to users (Otto, 2021).

However, the reuse of open educational resources raises the question of adapting these resources to new cultural contexts, which can generate barriers in

terms of their use, since the educational process differs between locations and cultures (Litto, 2006; Ferreira; Carvalho, 2018).

It is also worth mentioning that the absence or scarcity of governmental and institutional policies, which deal with the application of copyright and intellectual property rights, awareness of OER, technological and informational competence and incentives and rewards for the creation of educational resources, is considered a barrier to their development. Clarity regarding the licenses adopted for the use of OER is fundamental to promote their use. Regarding educational resources created within the institution, it is important to clarify whether the copyright belongs to the institution or to the creator. In the educational sector, intellectual property law has a strong influence on the development of open educational resources and their repositories, indoctrinating the attitude of users and content creators themselves (Truong; Denison; Stracke, 2021).

Similarly, Davis (2010), Mora Rivera and Coto Chotto (2017), Sancho Vinuesa *et al.* (2014), Valladares Rodríguez *et al.* (2014), Wong and Li (2019) indicate some factors that influence the use of OER:

- a) material quality;
- b) intellectual property issues, which generate resistance on the part of producers in sharing their own educational resources;
- c) support for an OER development policy;
- d) culture of sharing, reuse and creation of OER;
- e) technological infrastructure;
- f) computer skills.

According to Zanin (2017) to solve problems of access and reuse of OER, it is necessary to define the type of use license. In this sense, there are four possibilities for actions to use these resources, which are:

- a) reuse of the material in its original or modified form;
- b) adaptation or revision of the material;
- c) combination of original or revised material with another, to create something new;

- d) sharing copies of original, revised material or a combination of these materials.

All these factors, when nonexistent or inadequate, compromise the motivation of students, teachers and apprentices, to use and share OER in their teaching and learning practices.

The production of this type of educational material started with the Open Educational Resources Movement in 2001. The term OER was used for the first time in 2002 (Amante; Quintas-Mendes, 2016; Atenas; Havermann, 2014).

The source of inspiration for its creation was the Open Courses Ware (OCW) or open courses that provide content that can be used, adapted and redistributed under open licenses (Guedes; Gonçalves; Nascimento, 2015; Navarrete; Luján-Mora; Peñafiel, 2016).

From this initiative, consortia of universities from various countries and regions have emerged to develop their own open courses, such as OCW-Universia, which brings together Spanish, Portuguese and Ibero-American universities (Sánchez González, 2012).

In this process, libraries can be great collaborators in OER development initiatives, in addition to be a radiating center for promoting OER in teaching and learning (Ferguson, 2017; Goodsett; Loomis; Miles, 2017, Hannon *et al.*, 2013; Truong; Denison; Stracke, 2021).

An example of this is the University of Cleveland, which, through collaborative networks, develops work with librarians and teachers for the creation and promotion of OER (Goodsett; Loomis; Miles, 2016).

The need to expand access to education and the democratization of knowledge guided the direction of this movement. Considering this scenario, an important event was the declaration on OER at the UNESCO World Congress in 2012, which encouraged countries to:

- Foster awareness and use of OER.
- Facilitate enabling environments for use of Information and Communications Technologies (ICT).
- Reinforce the development of strategies and policies on OER.
- Promote the understanding and use of open licensing frameworks.
- Support capacity building for the sustainable development of quality learning materials.

- Foster strategic alliances for OER
- Encourage the development and adaptation of OER in a variety of languages and cultural contexts.
- Encourage research on OER.
- Facilitate finding, retrieving and sharing of OER.
- Encourage the open licensing of educational materials produced with public funds (Marcus-Quinn; Diggins, 2013, p. 244).

According to Phillips (2014):

In September 2013, the European Commission launched its "Opening Education" strategy - a central theme of its three-pronged strategy is Increase the use of Open Educational Resources (OER), ensuring that educational materials produced with public funding are available to all.

It should be noted that OER also personalize cost reduction by offering textbooks and more affordable materials, thus contrasting with the high costs of textbooks. In this way, they represent a reduction in time and cost, since what is already used is reused and access to these resources has not cost (Zanin, 2017).

Wong and Li (2019) highlight the innovative aspect of open educational resources in teaching by allowing sharing, the production of learning materials from existing ones and the connection with other educators around the world.

Educational resources can be seen as a crucial step for the evolution of education, as they expand access to education, be it formal, informal or non-formal, and contribute to social inclusion (Atenas; Havemann, 2014).

Therefore, it should be noted that the benefits resulting from the movement of open educational resources converge to social and economic development and, with this, this movement tends to grow.

According to Truong, Denison and Stracke (2021), with the emergence of the covid-19 pandemic, a promising ground has been created for the dissemination of OER to support online education that was imposed during the pandemic period. In this sense, the characteristics of teaching and learning have an influence on the popularity of OER, although some teachers are wary of making their educational resources open and sharing them, preferring to keep their copyright, while students are less motivated to do additional research or seek educational resources other than those provided by teachers.

According to Hutson *et al.* (2022), access to digital collections, which has increased with the covid-19 pandemic, should be accompanied by the wide acceptance of OER in institutions, in order to foster initiatives in the field of education.

Corroborating this thought, Perifanou and Economides (2022) point out that open educational resources can help to circumvent the problem of the lack of digital educational materials, whose demand has been amplified by the covid-19 pandemic, which has brought changes in education, based on the use of digital remote teaching platforms.

3.2 Open educational resources repositories

Open access educational repositories are formed by collections of digital educational resources, serving as a support tool for teaching and research activities, which differentiates them from institutional repositories, which may contain, in addition to other types of collections related to intellectual production of the institution, collections of educational resources produced by the institution itself or even by similar institutions.

According to Marcus-Quinn and Diggins (2013), the creation of open educational resource repositories has been expanding, considering that repositories are possible paths for one of the sustainable objectives of the 2030 agenda – “Learning opportunities for all” – to be realized.

Silva, Café e Catapan (2010, p. 101) defend that “[...] the educational repositories are aligned with an open, collaborative learning perspective and that intensively uses technological resources to stimulate the learner's autonomy and emancipation”.

Extending this idea, repositories, in addition to the storage and management of OER, can be considered as collaborative spaces, where communities of practice and exchange, evaluation and co-creation of educational resources can be created (Otto, 2021).

The dissemination of OERs for educational purposes could be leveraged with the development of user communities in OER repositories, as well as

repositories, through their social media groups, could maintain and attract more users (Perifanou; Economides, 2022).

According to Zervas, Alifragkis and Sampson (2014), OER repositories are central elements of the open education movement, being increasingly organized by higher education institutions.

As for use, Davis *et al.* (2010) highlight several benefits of this type of repository:

- a) curricular planning;
- b) educational development;
- c) student-focused learning;
- d) administration;
- e) public and student information;
- f) quality assurance;
- g) marketing and advertising.

Although the scientific literature highlights the value of repositories for teaching and research, it is not yet fully recognized. In this sense, the results of the study by Valladares Rodríguez *et al.* (2014) show the lack of incentive and awareness about their existence and the low familiarity and usability of educational repositories.

According to Truong, Denison and Stracke (2021), the use of open source code in the development of OER repositories requires lower investment and maintenance costs. On the other hand, it is necessary to have qualified personnel to customize the software to meet the needs of the institution where it will be deployed. Thus, technology limitations, i.e., software, systems and connectivity problems, affect the sustainability of OER repositories. In turn, economic constraints interfere with both the development and maintenance of repositories, which include the need for improvements in information technology infrastructure and investments in staff training and marketing.

Likewise, the limited functionalities of the open educational resource repositories are obstacles to their maintenance and sustainability, discouraging the use and research in these systems.

In addition, web search engines, especially google, compete with educational repositories for users' interest in finding the educational resources they need although the quality of the resources available on the web is doubtful.

On the other hand, there are many open educational resources that are still stored in local databases or individual or institutional websites, being unknown to the general public. These initiatives tend not to be sustained over time (Krämer; Klebl, 2011).

Davis *et al.* (2010) highlight, in addition to the repository on the intranet, the problem of access to these resources when they find that their sharing is restricted, due to institutional policies, to virtual learning environments (VLE), where only teachers and students can access them.

In the construction of OER repositories, policies, norms and standards are necessary in order to guarantee the proper management of its resources, dynamic interaction and the sustainability of the system, while its planning encompasses technical, managerial, pedagogical and legal dimensions.

For the recovery, reuse and sharing of open educational resources, it is essential to adopt metadata standards that describe the authorship, title, keywords/subject, language and, mainly, the learning objectives and technician requirements for use. It is also important to define how educational resources stored in the repository can be used, adopting usage licensing policies.

In this regard, it is worth highlighting the view of Silva, Café e Catapan (2010, p. 97): “[...] the metadata standards, commonly, seek to: present general aspects of the object; reveal technical aspects for developers of learning objects and show useful pedagogical aspects for teachers and educators”.

Perifanou and Economides (2022) draw attention to the need for repositories to feature accurate search mechanisms, which include adequate description of their contents, link checking and updating of educational resources, clear open licenses and OER evaluated by experts.

In addition, the ways in which users discover educational resources can provide interesting data for the development of metadata creation policies (Currier *et al.*, 2004).

The process of implementing OER repositories is based on modeling the basic aspects of a repository, such as its functionalities, collections, architecture, objective and management team (José; González Hernández, 2017).

These repositories must involve the participation of end users, such as teachers and students, in addition to the team of librarians and professionals in the area of Information Systems, in their construction. In this way, it is possible to make them a useful tool, offering services that meet the needs and expectations of users (Minguillón Alfonso *et al.*, 2014).

Thus, in the idealization of projects to create repositories of open educational resources, librarians are crucial actors, working collaboratively in the development and curation of digital content.

In this regard, Vrana (2021) emphasizes that OER repositories are components of the educational process and are part of libraries. Librarians working in libraries promote engagement with OER by encouraging the creation and use of these resources, ensure their availability and accessibility, provide guidance on intellectual property rights and train users, developing informational competence.

Atenas and Havermann (2014) consider in the creation of OER repositories, four key operations, which are based on a set of social and technical characteristics:

- a) search, to locate and recover the OER;
- b) share, to promote the dissemination of knowledge;
- c) reuse, which is one of the main objectives of OER and is very associated with sharing resources with other people;
- d) collaborate in the evaluation, reuse and creation of new resources. In this sense, OER repositories should be planned as spaces for interaction, collaboration and creation of new resources.

According to Dichev and Dicheva (2012), the infrastructure of the repositories must be rethought in order to solve the problem of content distributed in several repositories, leading to the need to search for relevant content in repositories, separately.

In this regard, search engines like google have an advantage over repositories as they allow for a more integrated search of resources but search engines do not provide services at the repository level.

To work around this problem, the use of technological solutions for collecting metadata, such as the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), seeks to ensure interoperability between systems.

The importance of interoperability between several repositories was one of the aspects mentioned by teachers, in the study by Yacinalp and Emiroglu (2015) on the usability and operability factors of the learning object repositories.

According to studies of Xu (2015, 2016), the integration of repositories with learning management systems is pointed out as a factor that encourages the use of repositories, as this facilitates access to educational resources by teachers and instructors.

Another relevant aspect in the creation of OER repositories are the services offered in these repositories, mainly those that promote interactivity and collaboration between users of the system.

A good example is the use of web 2.0 tools, to enable “debates and free participation and the creation and administration of personal groups, from the category “forum” that deals with current education topics and sharing content, information and research” (Guedes; Gonçalves; Nascimento, 2015, p. 316).

In their study of the functionality of 49 learning object repositories, Zervas, Alifragkis and Sampson (2014) identified some web 2.0 tools that add value to the services of these repositories, by facilitating interactions between teachers and learners around the OERs available in these systems.

Among the web 2.0 tools mentioned in the study Zervas, Alifragkis and Sampson (2014), the following stand out:

- a) wikis;
- b) forums;
- c) RSS Feeds;
- d) blogs;
- e) and social networks.

The knowledge of the potential of these tools by the developers of educational repositories tends to contribute to the increased use of repositories by educational communities, which would require further studies to confirm this assumption.

3.3 OER Repositories in higher education

Aspects related to repositories of open educational resources in higher education were addressed in the studies by Xu (2015, 2016), Otto (2021) and Truong, Denison and Stracke (2021).

Xu (2015) identified some motivational and impeding factors that influence the use of repositories by teachers in higher education institutions, with unfamiliarity with repositories being the main barrier to their use. He considers that understanding the behavior of teachers in relation to repositories is a key element for the development of strategies to increase the use of repositories (XU, 2015, 2016).

Otto's (2021) research with teachers showed that repositories are perceived as necessary in higher education institutions and should present quality control over the content made available, in addition to the use of appropriate metadata and open licenses for use. The results of this research indicated that teachers want to receive incentives and supports that foster affirmative attitudes towards sharing and collaboration, such as: legal advice on the creation and use of OERs, thus developing a positive perception towards the openness of educational resources rather than being forced to use OERs in teaching.

Truong, Denison and Stracke (2021) highlight the difficulties inherent in the implementation of OER repositories, especially in less developed countries.

They illustrate the case of Vietnam, which faces challenges in creating OER itself and developing repositories, which are related to: infrastructure, technology, economic constraints, socio-cultural characteristics, pedagogical issues and legal limitations.

4 Final considerations

The discussion about educational resource repositories open in the literature has revealed several facets of this object of study. In this sense, studies under different approaches are developed, seeking to understand the dynamics of an educational repository, its *modus operandi*, the usage behaviors of its users, the benefits and limitations of these repositories.

One of the key elements for studying educational repositories is open educational resources. This implies knowing the characteristics of these learning objects, the use licenses, the metadata standards for their description, aiming at their recovery and sharing, the life cycle and the technical and pedagogical aspects involved in their creation.

Open educational resources and repositories, as sources of management and dissemination of these resources, brought a new perspective to education, in the sense of openness to access, reuse and sharing and encouraging collaborative work to adapt, transform and create new content.

The creation of educational communities for the exchange of experiences, resource sharing and collaborative work has brought an encouragement to the educational needs of the academic community, aiming at the improvement and improvement of educational resources and their applicability in different contexts.

It is worth mentioning the formation of consortia of higher education institutions, in various regions of the world, dedicated to the production, use and dissemination of OER, with repositories being the conducive environment for the management of the content produced and for its dissemination.

In some studies, the factors that facilitate and/or hinder the use of repositories by higher education teachers have been demonstrated, pointing out the need to establish strategies, such as: the adoption of social and collaborative tools to promote the dynamic use of these repositories and harness their potential; the integration of repositories with learning management systems; the establishment of open access policies at the institutional level, as a means of raising awareness among the academic community about the use of OER repositories; maintaining quality and up-to-date educational resources; improving access to and expanding the dissemination of repositories.

In addition to the entire necessary infrastructure for the functioning of the OER repositories, which is evidenced in the literature, the services offered are an important differential for the maintenance, sustainability and use of the OER repositories, especially those that promote interactivity and collaboration between users of the OER system, giving the repositories a more dynamic character.

It is considered that the reflections carried out in this study indicate the need to broaden the understanding of the limitations and barriers to the sustainability and use of repositories of open educational resources from the perspective of the users of these systems, which requires further studies with this objective.

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Abrindo os horizontes para a educação: reflexões sobre repositórios de recursos educacionais abertos no ensino superior

Resumo: Os repositórios de recursos educacionais abertos vêm se expandindo em várias regiões do mundo, o que conduz à necessidade de refletir sobre o papel desses repositórios e suas implicações para o ensino e a pesquisa no ensino superior, sendo este o objetivo deste estudo. Para isso, adotou-se a pesquisa exploratória qualitativa como abordagem metodológica, para compor a revisão de literatura sobre o fenômeno em estudo, buscando fundamentar as discussões em torno dele. Utilizaram-se, como parâmetros de pesquisa, levantamentos bibliográficos nas bases Scopus e Web of Science para coleta e análise de dados. Conforme os resultados obtidos, evidenciou-se que os recursos educacionais abertos e os repositórios como fontes de gestão e disseminação desses recursos trouxeram uma nova perspectiva para a educação, no sentido de abertura para o acesso, o reuso e o compartilhamento e de incentivo ao trabalho colaborativo para adaptar, transformar e criar novos conteúdos e práticas educacionais, contribuindo, desse modo, para inovações e maior interatividade no ambiente de ensino e aprendizagem. Contudo, é preciso ampliar a compreensão sobre as limitações e barreiras para a sustentabilidade e uso dos repositórios de recursos educacionais abertos sob a perspectiva dos usuários desses sistemas.

Palavras-chave: educação aberta; recursos educacionais abertos; repositório de recursos educacionais abertos; ensino superior

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