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OPEN EDUCATIONAL PRACTICES, USE AND ADAPTATION OF OPEN EDUCATIONAL RESOURCES IN HIGHER EDUCATION. A SYSTEMATIC REVIEW

Prácticas educativas abiertas, uso y adaptación de recursos educativos abiertos en la educación superior. Una revisión sistemática

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Abstract

Studies on Open Educational Practices (OEP) and Open Educational Resources (OER), pillars of open education, are increasing but remain confined to limited geographical areas or timeframes, without offering a global perspective on their implementation in higher education. This article investigates the main OER implemented, their uses, adaptations, benefits and challenges in the higher education context. The SCOPUS and Web of Science databases were consulted following the PRISMA protocol. The findings describe the forms of OER implementation, the types of OER and the most used platforms, as well as the principal barriers and limitations to their use.

Keywords: Higher Education, Open Practices, Open Educational Resources, university.

Resumen

Los estudios sobre Prácticas Educativas Abiertas (PEA) y Recursos Educativos Abiertos (REA), pilares de la educación abierta, son cada vez más numerosos, pero contextualizados en áreas geográficas o espacios de tiempo limitados, sin una visión global de su implementación en la educación superior. Este artículo indaga las principales PEA implementadas, los usos, la adaptación, los beneficios y desafíos de los REA en educación superior. Se consultan las bases de datos Scopus y Web of Science, según el protocolo PRISMA. Los hallazgos incluyen las formas de implementación de PEA, tipos de REA y plataformas más utilizados, principales barreras y limitaciones del uso de REA.

Palabras clave: educación superior, prácticas abiertas, recursos educativos abiertos, universidad.

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1 | Introduction

Since 2001, with the launch of the OpenCourseWare program by the Massachusetts Institute of Technology (MIT), Open Educational Resources (OER) have gained wide visibility and been adopted by a vast number of educational institutions thanks to their multiple benefits—especially reduced textbook costs and easy accessibility. Santos-Hermosa and Abadal (2017) highlight two fundamental characteristics that constitute the essence of OER: the use of open licenses and the possibility of reuse.

At the 2002 Forum on the Impact of OpenCourseWare for Higher Education in Developing Countries, organized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and sponsored by the Hewlett Foundation, the term "Open Educational Resources (OER)" was coined for the first time. According to UNESCO (2002), OER are resources in the public domain or published under an open intellectual-property license that allows free use by others for teaching, learning or research. These resources include any tool, material or technique that supports access to knowledge, such as textbooks, videos, complete courses, course materials, modules, tests and software.

On November 25, 2019, UNESCO member countries adopted the Recommendation on Open Educational Resources (OER) during its 40th General Conference. In that document, they define OER as:

> "learning, teaching and research materials, in any format and support, in the public domain or protected by copyright and that have been published under an open license that allows access to them, as well as their reuse, reconversion, adaptation and redistribution at no cost by third parties" (UNESCO, 2019, p. 22).

Since the term OER first appeared in 2002, numerous studies have explored various dimensions of these resources: their role across educational levels and their primary benefits and challenges (Belikov & Bodily, 2016; Glasserman & Ramirez, 2014; Mishra & Singh, 2017; Wijayati et al., 2022); issues of quality and assessment (Bethencourt-Aguilar et al., 2021); teacher and student attitudes toward OER (Georgiadou & Kolaxizis, 2019; Zhang, 2020); patterns of use and adoption in different educational contexts (Rodríguez et al., 2018; Rush & Landgraf, 2023); and the types of resources and licensing models employed (González et al., 2017). Collectively, these investigations have demonstrated the advantages and benefits of integrating OER into educational settings.

Building on this momentum, a variety of initiatives have emerged worldwide to leverage the potential of OER, including Eplatform for

Adult Learning in Europe (EPALE), Open Discovery Space (ODS), Global Science Labs (Go-Lab), MERLOT, and OER Commons. In Latin America, notable examples are the Red Latinoamericana de Portales Educativos (RELPE), TEMOA and EDUTEKA, which are described in Table 1.

Table 1. Description of OER platforms

Platform	Aim	Beneficiaries
Eplatform for Adult Learning in Europe (EPALE)	To support and strengthen professions in the adult learning sector by promoting contact among colleagues across Europe through forums, blogs, matchmaking tools and in-person meetings.	Educators and trainers, guidance counselors and support staff, researchers and members of academic institutions; policymakers.
Open Discovery Space (ODS)	To engage school communities in integrating innovative practices that enable them to share, adopt, use and reuse existing educational content throughout the teaching-learning process.	Teachers, students and parents in European school communities.
Global Science Labs (Go-Lab)	To provide remote access to real physical laboratories—equipped and hosted by universities or research centers—for data collection, as well as to virtual labs that simulate experiments.	Students aged 10–18 (particularly in STEM subjects) and their teachers.
MERLOT	To offer free access to online learning and support materials, along with content-creation tools contributed by an international educational community.	Teachers and students, especially in higher education.
OER Commons	To offer a collaborative digital public library of OER—including complete courses, course materials, modules, textbooks, videos, tests and software—that users can access, reuse and remix at no cost and without requesting permission.	Teachers, students and researchers.

(Continuation)

Platform	Aim	Beneficiaries
Red Latinoamericana de Portales Educativos (RELPE)	To promote and consolidate autonomous, public-service, national educational portals across Latin America and the Caribbean in order to reduce the digital divide, enhance quality and equity in education, and strengthen collaborative networks.	Teachers and students throughout Latin America and the Caribbean.
TEMOA	To provide a catalog of OER for use in virtual environments, accessible online to support the teaching-learning process.	Teachers and students, from preschool through graduate levels.
EDUTEKA	To offer educational content and tools—such as research-portal references, best practices, articles, curricula, links, images, projects and videos—that improve learning spaces and support educator training.	Teachers, school administrators and teacher trainers in Colombia and Ibero-America.

Note. Prepared by the author.

Within the framework of open pedagogy, the term Open Educational Practices (OEP) also arises, understood as guidelines that encourage the use and creation of OER and other forms of open education. According to Chiappe and Martínez (2016), OEPs can be understood as educational activities—such as planning, evaluation, or curriculum design—organized in a coherent framework and informed by open-movement principles like free access, reuse, remixing, and adaptation.

Recently, instructional design has often been based on the creation, use or reuse of OER, which integrates content, tools and implementation resources, thereby turning OER into mediating agents in the process of knowledge appropriation.

Within these practices, as Chiappe (2012) points out, are open teaching, open evaluation, open production of educational resources, open didactic planning and open curriculum design—i.e., the fundamental practices of the educational process. It should be noted that, in contrast to the vast literature on OER, studies on open practices remain rather scarce.

Within the findings of previously conducted literature reviews consulted for this research, it has been observed that both teachers and students report positive experiences with OER (Hilton, 2016; Hilton, 2020; Tlili et al., 2019). These reviews also indicate that a significant benefit of using OER is the reduction of costs associated with higher education (Annand & Jensen, 2017; Hilton, 2016). Some, such as Hilton (2020), analyze the effectiveness of OER and conclude that students achieve the same learning outcomes regardless of the type of resources used.

Other studies examine the perceived importance of these resources (Rea, 2018) or their impact (Ebner et al., 2022). The challenges of implementing strategies and policies for OER integration are likewise discussed (King et al., 2018; Luo et al., 2020; Otto, 2019; Tlili et al., 2021).

Given the above, the main objective of this systematic literature review (SLR) is to identify open practices and the use and adaptation of OER in higher education. This SLR will serve as a theoretical framework for broader research that includes designing and creating an OER repository for teacher training at the Instituto Superior de Formación Docente Salomé Ureña (ISFODOSU), as well as diagnosing current patterns of OER use and adaptation in teacher training across the Dominican Republic.

To this end, the following questions are posed:

Q1. What open practices are implemented in higher education?

Q2. What types and purposes of OER exist, and what are their main standards and platforms used in higher education?

Q3. What forms of OER adoption occur in higher education?

Q4. What information on metadata and pedagogical aspects do OER include?

Q5. What barriers and benefits are attributed to OER in higher education?

2 | Methodology

This study is qualitative in nature, conducted as a systematic literature review (SLR). It goes beyond mere frequency or term analysis by examining each document in depth to draw detailed conclusions addressing the research questions. Specifically, it follows the PRISMA protocol (Page et al., 2021), beginning with the design of the review process that establishes

the research questions, search strategies and information sources, eligibility criteria for inclusion and exclusion, data-extraction methods and the project timeline.

For data analysis, first a descriptive quantitative analysis was performed to provide a general overview of SCOPUS and Web of Science publications related to OER during the study period. Second, a qualitative analysis was conducted to organize and interpret the findings from the 42 articles selected for their relevance, structured according to the sequence of the research questions.

2.1 Databases, descriptors and search strategies

For the search, information was drawn from the SCOPUS and Web of Science databases. These web platforms, known for their multilingual and multidisciplinary content, are widely considered the most comprehensive, renowned and recognized search tools in the field of research. The search encompassed articles published over the last 10 years, a period deemed reasonable, from 2014 up to 2023, the date of this study. Only articles written in English or Spanish were included.

Regarding the descriptors, these were formulated using keywords in both English and Spanish, alongside the Boolean connectors AND, OR and NOT. The English keywords employed were OER, "Open Educational Resources," "higher education," and "university." In Spanish, the corresponding terms were "Recursos Educativos Abiertos," "educación superior," and "universidad."

These keywords were then used to construct search formulas for both the SCOPUS and Web of Science platforms. For English, the formula was: ("open educational resources" OR OER) AND ("higher education" OR university). In Spanish, the combinations used were: ("Recursos educativos abiertos") AND ("educación superior" OR universidad). Searches for "open practices" were conducted separately from "Open Educational Resources," yielding the following formulas: ("open practice") AND ("higher education" OR university) for English, and ("prácticas abiertas") AND ("educación superior" OR universidad) for Spanish.

2.2 Inclusion and exclusion criteria

The research protocol defined eligibility criteria aligned with the research questions and objectives, addressing aspects such as publication source, language, educational level and document date. The criteria are detailed below:

2.2.1 Inclusion criteria

- Journals indexed in the SCOPUS and Web of Science databases
- Articles published between 2014 and 2023 (inclusive)
- Studies in Spanish or English
- Studies conducted exclusively at the higher education level
- Articles with full-text access

2.2.2 Exclusion criteria

- Previous systematic reviews
- Studies in languages other than English or Spanish
- Articles on open educational resources at pre-university or technical levels
- Articles limited to specific resources such as MOOCs, open textbooks, etc.

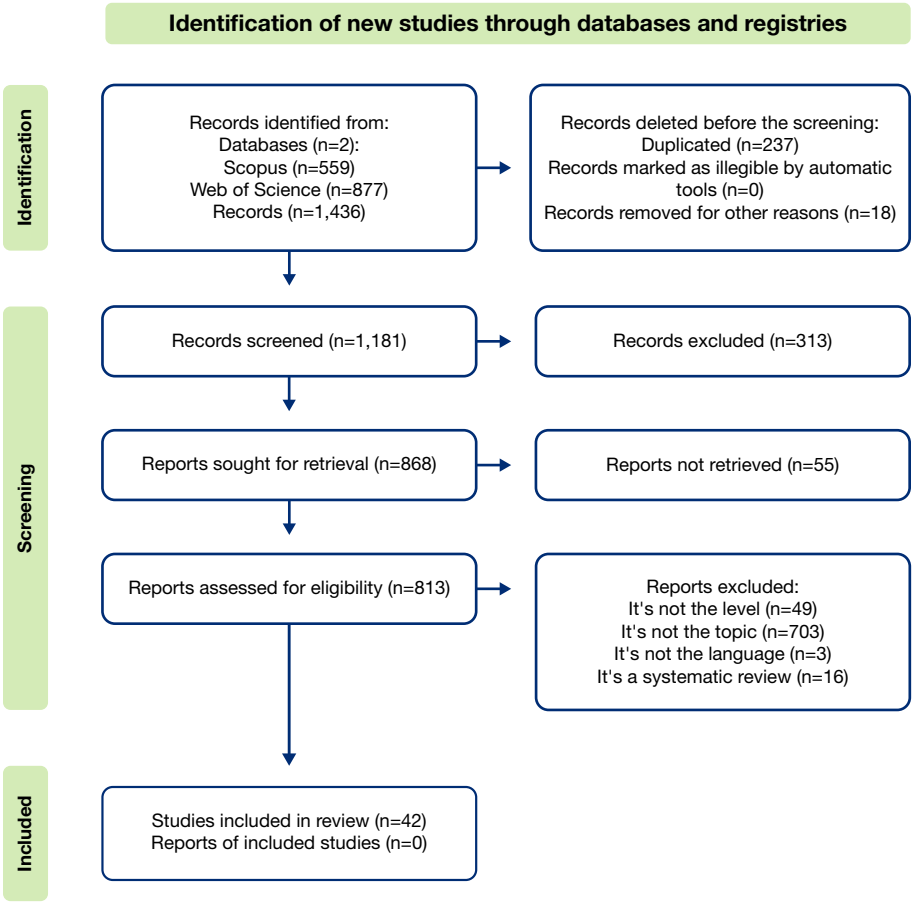
2.2.3 Search process and selection of articles

Searches were conducted from July to December 2023. By applying the established keyword-and-Boolean-operator formulas in the SCOPUS and Web of Science databases, a total of 1,436 articles were retrieved.

Following the PRISMA protocol guidelines, 237 duplicate records were removed, along with 18 studies unrelated to the educational field, leaving 1,181 articles for screening. A title review then led to the exclusion of 313 articles that did not focus on higher education or addressed unrelated topics. This initial screening produced 868 articles for full-text consideration; however, 55 of these proved inaccessible due to paywalls or membership restrictions.

Ultimately, 813 studies remained eligible for evaluation against the inclusion and exclusion criteria. Of these, 49 were excluded for not addressing the correct educational level, 703 did not concern OER or open practices or were limited to specific resources such as MOOCs or open textbooks, three were published in languages other than English or Spanish, and 16 were previous systematic reviews. The final sample comprised 42 articles, as illustrated in the PRISMA flow diagram (Figure 1).

Figure 1 | PRISMA diagram



Note. Source: Own elaboration using the PRISMA diagram extracted from Page et al. (2021).

3 | Results and Discussion

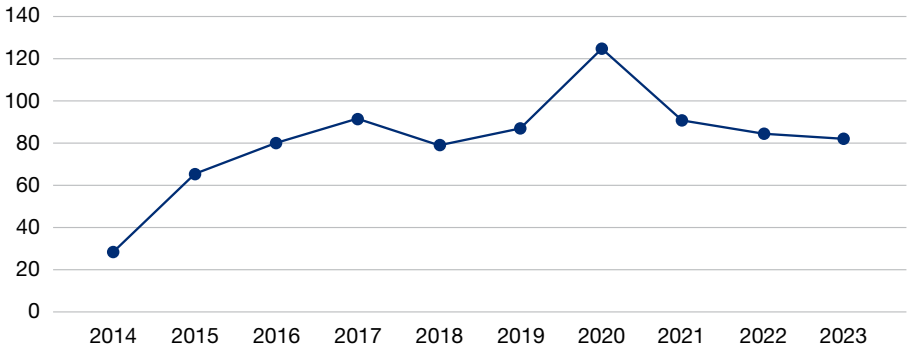
First, a descriptive quantitative analysis provides a general overview of OER and OER-related publication trends in SCOPUS and Web of Science during the study period. This analysis examines the year of publication, the region where the research took place and the sample selected for the studies.

Figure 2 illustrates the number of publications each year from 2014 to 2023. It clearly shows that 2020 had the highest output of articles on the topic, published in both the SCOPUS and Web of Science databases. This

surge might be attributed to the COVID-19 pandemic period, which saw an increase in research across all fields (Perdomo, 2021; Gómez et al., 2021).

Following 2020, both 2017 and 2021 recorded a similar number of publications, with 92 and 91 articles, respectively. Notably, 2014 had the lowest number of published articles, with only 29 studies.

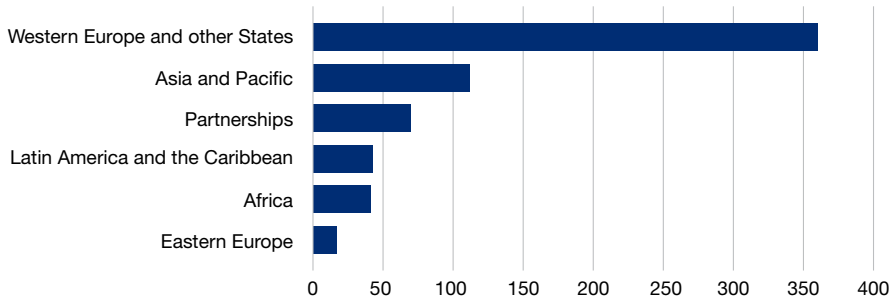
Figure 2 | Number of articles per year of publication



Note. Source: own elaboration.

To determine the research's scope, the geographical regions where these studies were conducted were analyzed. The division established by the United Nations Organization served as the reference, categorizing regions as: Africa; Latin America and the Caribbean; Asia-Pacific; Western Europe and Others (including the United States, Canada, Australia, New Zealand, Turkey, and Israel); and Eastern Europe. Some research involved countries from different regions, so these were grouped under the "Collaborations" category. Figure 3 presents the results by publication region.

Figure 3 | Number of articles per geographic region

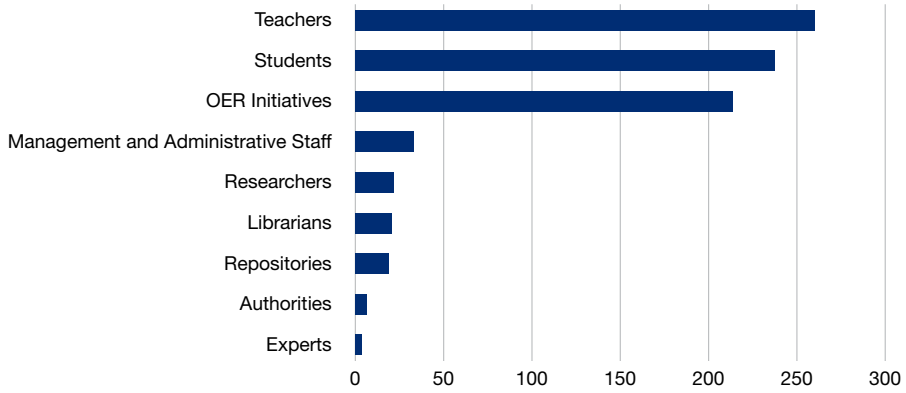


Note. Source: own elaboration.

Publications from the Western Europe and Others region have a significant lead over other areas, nearly tripling the output of the next closest region, Asia-Pacific. This finding aligns with the results from Zancanaro et al. (2015), which concluded that most of the reviewed research was conducted in Europe and North America. It is also important to note that, when looking at individual countries, the United States reported the highest number of investigations with 160 studies. It's followed by the United Kingdom with 34, Canada with 28, Spain with 27, and both China and India with 20 publications each.

Regarding the sample selected for the research, the studies primarily targeted teachers, students, librarians, management and administrative staff, repositories, OER initiatives, experts, and authorities. Figure 4 illustrates the distribution of these respondents.

Figure 4 | Number of articles per sample



Note. Source: own elaboration.

A total of 258 studies included teachers as part of their sample. Students were selected in 235 studies, while OER Initiatives were analyzed in 212 articles. Experts and authorities, however, were considered in very few studies.

After an overview of the publications found during the RSL, Appendix 1 summarizes the 42 articles selected and analyzed according to the parameters established in the Research Plan. This appendix includes information on the authors' names, article title, region where the study was conducted, the sample selected, the year of publication, and the questions (along with their various sections) addressed by each study.

The results of the analysis of these 42 selected articles are presented below, following the order of the research questions. Each question, in turn, is examined from various aspects, which are indicated in each subsection.

Q1: What open practices are implemented in higher education?

Of the 42 selected articles, 10 address the first question about which open practices are implemented in higher education. In this regard, some studies (Cox & Trotter, 2017; Cronin, 2017; Masterman, 2016; Nascimbeni et al., 2018; Stagg et al., 2018) discuss the implementation of OEPs and emphasize that language and context must be considered. They argue that one must go beyond mere retention, reuse, revision, remixing, and redistribution to allow recontextualization that embraces local knowledge, while also integrating all actors in the educational ecosystem. In addition, these authors contend that institutional policies, reward and recognition processes, intellectual property considerations, financial investment, and implementation strategies for open education—including OER, MOOCs, and open textbooks—should be taken into account. They indicate that implementation must cover every aspect of the process: learning, content, teaching, and assessment.

Other authors (Marín et al., 2022; Masterman, 2016; Oliver, 2020; Schophuizen et al., 2021; Stagg, 2017; Stagg et al., 2018) examine the challenges faced by OER, mentioning the identification of relevant materials, a lack of recognition of open education's potential, resistance to abandoning traditional teaching methods, poor teacher-student communication using available resources, and a lack of institutional support and open policies.

Meanwhile, several articles (Marín et al., 2022; Masterman, 2016; Oliver, 2020; Stagg, 2017; Schophuizen et al., 2021; Veletsianos, 2015) outline a typology of OEPs. They describe practices focused primarily on the teacher—using, adapting, or creating OER for teaching (e.g., MOOCs on EdX or Coursera); those centered on the content-production process and students (such as textbooks and student-created OER); and hybrid approaches that are both teacher- and learner-centered, such as renewable assignments whose outputs (e.g., quiz questions, opinion pieces, instructional videos) retain value beyond the classroom.

In general, publications on OEPs remain very limited compared to those on OER. Therefore, it is crucial to promote OER adequately to expand research into their degree of implementation across countries, the existence of supportive policies and the integration of all stakeholders in the education sector.

Q2: What types and purposes of OER exist, and what are their main standards and platforms used in higher education?

The question addresses two recurring aspects in most articles: the types of OER and their intended purposes, as well as their origins and the primary higher-education platforms. Studies on OER types (Baas et al., 2019; Baas & Schuwer, 2020; Danekar & Lihitkar, 2021; Hettige et al., 2022; Kumar & Singh, 2019; Kumar et al., 2021; Marín et al., 2022; Muganda et al., 2016; Wiche & Ogunbodede, 2021; Zagdragchaa & Trotter, 2017) list research articles, audio files, datasets, questionnaires, full or partial courses (modules/units), infographics, textbooks, e-books, lecture notes, lesson plans, images (illustrations, graphs, maps, photographs), podcasts, slide presentations, quizzes, tutorials, videos, exercises, assessments, interactive games, wikis, social networks, bibliographic databases, e-journal collections, papers, project reports, teaching materials from other universities, group lessons, learning objects, reading lists, timetables, animations, rubrics, blogs, teaching guides, technical reports, teaching portfolios, software, simulations, conferences, internships, experiments, demos, desktop applications, case studies, theses, syllabi, glossaries, open institutional repositories, e-learning platforms, and plagiarism-detection tools.

Articles on platforms (Danekar & Lihitkar, 2021; Datt & Singh, 2022; de Hart et al., 2015; Mishra & Singh, 2017; Mtebe & Raisamo, 2014; Muganda et al., 2016; Muniyasamy & Jeyshankar, 2023; Zagdragchaa & Trotter, 2017) highlight MIT OpenCourseWare, Creative Commons, MERLOT, YouTube, Khan Academy, the OpenCourseWare Consortium, Google Scholar, MiriadaX, Coursera, edX, Google Drive, Flickr, PowerPoint, Wikipedia, Wikieducator, DOAJ, SlideShare, Prezi, Issuu, ERIC, Swayam, NPTEL, OER Commons, TESSA, Vimeo, TEDx, Kahoot, and Mentimeter, as well as various institutional, national and regional repositories.

To determine OER origins, several studies (Baas et al., 2019; Baas & Schuwer, 2020; Beaven, 2018; Dietze et al., 2015; Zagdragchaa & Trotter, 2017) report that OER may come openly from the internet, be self-created, sourced from colleagues, publishers, or commercial providers, drawn from OER repositories, or privately shared among peers.

Some authors (Alkhasawneh, 2020; Beaven, 2018; Cooney, 2017; Danekar & Lihitkar, 2021; Mishra & Singh, 2017; Muganda et al., 2016; Muniyasamy & Jeyshankar, 2023) outline purposes for OER creation and use, including preparing course materials, seminars or conferences; updating knowledge; writing articles; conducting research; sharing with colleagues and students; and building personal collections.

Regarding OER usage, most articles identify audiovisual, bibliographic, didactic, and software materials, along with social networks, as the main resources for preparing classes, conferences, training activities, and knowledge updates. The most frequently accessed platforms are YouTube, MIT OCW and MERLOT, and the most common standards employed are Dublin Core and Creative Commons licenses.

Q3: What forms of OER adoption occur in higher education?

A significant number of the selected articles are oriented to answer Q3 related to OER adoption processes. Some authors (Baas & Schuwer, 2020; Cox & Trotter, 2016; Hettige et al., 2022; Mishra & Singh, 2017; Schuwer & Janssen, 2018) make mention of the different factors that influence OER adoption, among which they highlight: (1) a willingness to adopt OER, serving as a source of inspiration and a means to gain fresh ideas, enhance efficiency, and save time; (2) facilitation of a desired pedagogical design, acting as a complement to mandatory resources and enriching learning experiences; (3) the availability of relevant, high-quality OER (for example, those produced by accredited institutions or recommended by trusted colleagues); (4) the ability to find, use, create, or upload OER—either independently or with assistance—demonstrating ICT proficiency and awareness of intellectual-property rights; and (5) a desire or need to share—not only for personal satisfaction but also to receive feedback, bolster professional and organizational reputation, build confidence through membership in a larger community, expand one's network and sphere of influence, and thus increase the likelihood of recognition, a sense of accomplishment, and greater visibility among peers and other stakeholders.

An important aspect highlighted in OER adoption is the life cycle described by several authors (Beaven, 2018; Pulker & Kukulska, 2020). They posit that it begins with a search to adapt a resource. Once these materials are located, they are combined, adapted, contextualized, and integrated with other assets to compose a new teaching sequence. This phase is followed by a process that leads to the reappropriation of the resource, which, after reflection and evaluation, is shared, initially in closed environments and then more widely through repositories.

Other studies (Beaven, 2018; Cardoso et al., 2019; Dietze et al., 2015; Feldman-Maggor et al., 2016; Mićunović et al., 2023; Prasad & Usagawa, 2014; Schuwer & Janssen, 2018; Zagdragchaa & Trotter, 2017) identify two primary forms of adoption: reuse in its original form (without modification) and context-driven adaptation (translation, summarization, rewriting, resequencing, or localization).

Modifications and adaptations can include physical changes to resources, alterations in wording, adjustments in appearance, modifications of activities without changing the resource file itself, adding or removing steps from an activity, changing its pedagogical use, adapting the way a resource is employed to suit different contexts, styles, or objectives, simplifying an activity by using fewer tools than originally suggested, or incorporating additional tools to enhance it.

According to the research, the adaptation and adoption of OER involve a cycle that begins with reviewing resources produced by others, which may be used in their original form or have adaptations and changes applied so they can be reused in a way that reflects the reality of their intended use. This occurs frequently with resources in other languages, which must be linguistically and culturally adapted to the local context where they will be employed.

Some literature reviews, such as that by Chiappe and Arias (2015), have focused on the OER reuse process, concluding that Latin American, North American, and European lines of thought converge on adoption as a core driver for reuse. They also identify several factors influencing OER adaptation and adoption, including educators' technical skills, the willingness of actors within the educational system, and the intrinsic quality of the OER.

Q4: What information on metadata and pedagogical aspects do OER include?

Few authors have discussed how the selected articles address metadata and pedagogical information, which pertains to Question 4. In the limited literature that mentions metadata standards (Dietze et al., 2015; Santos-Hermosa et al., 2020), the most frequently cited are Dublin Core (DC), IEEE Learning Object Metadata (LOM), ADL SCORM5, Marc21, MARCXML, Europeana Data Model (EDM), CDS-invenio, Pandora, SupLOMFR, METS/PLMET and IMS QTI.

Regarding pedagogical aspects, Dietze et al. (2015) and Santos-Hermosa et al. (2017) note that some OER include information on educational level or grade, intended or suggested use, target audience, pedagogy, subject area, learning objectives, estimated learning time and related syllabus. Other OER may also provide discipline descriptions, licensing details or learning outcomes, incorporate commonly used concepts, vocabularies and properties, and include titles, descriptions and licensing models.

Q5: What barriers and benefits are attributed to OER in higher education?

A high percentage of articles mention both the challenges or barriers to OER use and adoption and the benefits they bring to higher education

(Algers & Silva-Fletcher, 2015; Alkhasawneh, 2020; Baas et al., 2019; Beaven, 2018; Belikov & Bodily, 2016; Cardoso et al., 2019; Cooney, 2017; Cox & Trotter, 2017; Datt & Singh, 2022; de Hart et al., 2015; Dietze et al., 2015; Feldman-Maggor et al., 2016; Guo et al., 2015; Hassall & Lewis, 2017; Hettige et al., 2022; Kumar & Singh, 2019; Kumar et al., 2021; Marín et al., 2022; Menzli et al., 2022; Mićunović et al., 2023; Mishra & Singh, 2017; Mtebe & Raisamo, 2014; Muganda et al., 2016; Muniyasamy & Jeyshankar, 2023; Prasad & Usagawa, 2014; Schuwer & Janssen, 2018; Wiche & Ogunbodede, 2021; Zagdragchaa & Trotter, 2017). These studies identify various types of barriers—personal, technical, legal and institutional—as highlighted in Table 2.

Table 2. Barriers to the use and adoption of OER

Barriers	Description
Personal barriers	Authors note insufficient time to create or evaluate OER; difficulty finding existing resources on relevant topics; lack of confidence in the quality of one's own or others' work; limited knowledge and awareness of OER; and a low sense of individual agency. They also highlight the absence of reward or incentive systems; fear of peer scrutiny, misinterpretation or misuse of their OER; a lack of motivation to create or adapt OER; and challenges locating resources that are both relevant and contextually appropriate.
Technical barriers	These encompass both individual and institutional factors. At the individual level, authors report inadequate ICT skills for OER creation and use; unfriendly interfaces; confusion over open licenses; and language barriers when OER are not available in the user's native tongue. Institutionally, technical obstacles include outdated infrastructure and resources; insufficient bandwidth; limited availability of required courses; lack of dedicated technological support; broken or inaccessible resource links; and interoperability issues across platforms.
Legal barriers	Frequently mentioned obstacles include limited understanding of intellectual property rights, copyright law and Creative Commons (CC) licenses.

(Continuation)

Barriers	Description
Institutional barriers	These barriers involve absence of an institutional OER policy or strategy; low organizational awareness of OER; lack of promotional or adaptation support from the institution; and minimal backing from leadership or management.

Note. Source: own elaboration.

In contrast to the barriers, the literature also highlights a range of benefits offered by OER, which can be grouped into personal and general categories. Among the personal benefits identified are enhanced personal satisfaction and an improved professional image, leading to greater reputation; the opportunity to share knowledge as a core academic value; chances to learn new skills; collaboration with peers in OER production; recognition by colleagues; and increased student engagement.

General benefits in higher education include reduced costs of university study, since OER are free; time savings; and the availability of open licenses. Teaching and learning become more adaptive and flexible, positively impacting student outcomes while promoting lifelong learning. Finally, OER enable the global dissemination of research and provide diverse perspectives on any given course.

The results indicate that most articles report similar challenges and benefits of using or adapting OER, regardless of geographic region. The most prominent challenges are personal barriers—such as insufficient ICT skills, lack of time or incentives to create and use OER—, technical barriers like limited infrastructure or poor bandwidth, legal barriers related to licensing, and institutional barriers such as absence of OER policies, echoing the findings of Luo et al. (2020). Similarly, the recognized benefits—peer recognition, lower educational costs and easy access—underscore the value of OER across contexts.

4 | Conclusions

This systematic literature review (SLR) reveals a surprisingly limited number of publications on Open Educational Practices (OEP), despite their demonstrated importance and impact on higher education. The

existing studies focus primarily on implementation models, practice types and challenges, indicating a gap in broader thematic coverage.

Three essential factors emerge for successful OEP implementation. First, all stakeholders within the educational ecosystem must be actively engaged. Second, institutional commitment is crucial for designing and enacting supportive policies and strategies. Third, every stage of the educational process—from curriculum design to assessment—must be addressed.

It is evident that OEPs can adopt different emphases: a teacher- and teaching-centered model, as exemplified by MOOCs; a student- and content-centered approach, such as textbooks and Open Educational Resources; or a blended teacher- and student-centered strategy, like instructional videos.

However, several challenges emerge when integrating OER into these practices: resistance to moving away from traditional methods, limited awareness of open education's potential, and insufficient institutional support or open-policy frameworks.

The approach to OER—both in terms of the number of articles analyzed and the diversity of topics covered—was broad and geographically representative, offering a comprehensive perspective on the status of OER in higher education.

The RSL identified the primary types of OER in use as textbooks, images and videos, presentations, courses and tutorials, conference notes and papers, games and simulators, assessments, e-journals, academic articles, teaching resources, and podcasts. These materials are typically accessed via the most popular platforms—YouTube, MIT OpenCourseWare, MERLOT, and Khan Academy—as well as through regional and national initiatives such as India's Swayam platform.

Evidence indicates that, during adaptation, OER should be translated—since most are originally in English—and contextualized to the environment in which they will be reused. Often, adaptation entails modifying both the content and the appearance of the original resource. Two critical factors in this process are the perceived quality of the OER and its ease of access.

The findings conclude that OER are most frequently reused for teaching, project or paper preparation, and research—primarily by drawing on repositories or collaborating with colleagues.

Notably, two aspects scarcely addressed in the literature are the metadata standards applied to OER and their pedagogical underpinnings. Of the limited metadata information available, the most widely adopted standards

are Dublin Core (DC), Learning Object Metadata (LOM) and the Sharable Content Object Reference Model (SCORM), with the Europeana Data Model (EDM) prevailing in European contexts. Regarding pedagogical metadata, OER descriptions generally include discipline, educational level, learning objectives, licensing terms, target audience, and intended use.

The most recurrent theme across nearly all the articles analyzed concerns, on the one hand, the challenges and barriers, and, on the other, the advantages and benefits of OER. An interesting conclusion of this SLR is that, regardless of the geographic region in which a study is conducted, most research identifies the same challenges and benefits associated with OER use in higher education.

The evidence shows that the fundamental benefits attributed to OER include free access, time savings, and ease of use—factors that enable reach into the most disadvantaged communities, thereby fostering greater knowledge exchange and imbuing OER with an altruistic, reciprocal dimension.

Studies further indicate that, at the individual level, OER developers gain both institutional and peer recognition, which enhances their professional reputation and boosts self-confidence. This recognition also facilitates collaboration with colleagues and may yield financial incentives, whether through teaching credits or academic evaluation merits.

Most research reports similar findings regarding OER barriers and challenges. On a personal level, these include a lack of time or technical expertise to develop OER, insufficient subject-matter knowledge or interest, low confidence in OER quality, and a dearth of incentives and rewards. Institutionally, barriers arise from the absence of coherent strategies and policies for OER use and adaptation.

It should be noted that the studies also reveal legal and technical barriers. Among the legal barriers are a lack of understanding of intellectual property and little or no control over legal rights by OER creators, which prevents them from sharing their materials since rights and permissions belong to their institution.

Regarding technical limitations, they mention inadequate bandwidth, poor infrastructure, difficult-to-use platforms, and lack of access to necessary resources—challenges that are particularly acute in the most vulnerable and economically depressed areas. Other challenges include the scarcity of contextualized OER, the difficulty of finding relevant resources, and the language in which the OER are developed.

While it can be concluded that this RSL offers a broad perspective on the main aspects that favor the implementation and adaptation of OER in higher education settings—based on an analysis of scientific literature—it is worth mentioning that there are other highly informative documents prepared by institutions such as the United Nations Educational, Scientific and Cultural Organization. For example, the Guidelines for the Development of Open Educational Resources Policies (UNESCO, 2020) can serve as very useful complementary documentation.

A limitation of this study is that, given the breadth and diversity of the OER literature, the review adopted a general perspective and consequently was unable to cover specific initiatives, such as open textbook adoption projects or the development of a MOOC within particular higher education institutions. Furthermore, this study does not address the implementation, use, and adaptation of OER at pre-university levels (initial, basic, secondary, or technical education).

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Author contributions

Conceptualization: A. J.; Methodology: U. M.; Software: A. J.; Validation: D. J.; Formal analysis: A. J.; Investigation: A. J.; Resources: U. M., D. J.; Data curation: A. J.; Writing – original draft: A. J.; Writing – review & editing: U. M., D. J.; Visualization: A. J.; Supervision: U. M., D. J.; Project administration: D. J.; Funding acquisition: U. M.

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Annex 1 | Results according to research questions

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
Prasad D.; Usagawa T.	Towards development of OER derived custom-built open textbooks: A baseline survey of university teachers at the University of the South Pacific	Asia-Pacífic	Teachers	2014										x			x
Mtebe J.S.; Raisamo R.	Investigating perceived barriers to the use of open educational resources in higher education in Tanzania	África	Teachers	2014					x								x
Dietze, S; Taibi, D.; Yu, H.Q.; Dovrolis, N.	A Linked Dataset of medical educational resources	Western Europe and others	Repositories	2015						x				x	x	x	x
Guo Y.; Zhang M.; Bonk C.J.; Li Y.	Chinese faculty members' Open Educational Resources (OER) usage status and the barriers to OER development and usage	Asia-Pacífic	Teachers	2015													x
Algers A.; Silva-Fletcher A.	Teachers' perceived value, motivations for and adoption of open educational resources in animal and food sciences	Western Europe and others	Teachers and Researchers	2015													x

(Continuation)

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
de Hart K.; Chetty Y.; Archer E.	Uptake of OER by staff in distance education in South Africa	África	Teachers and Researchers	2015					x								x
Veletsianos, G.	A case study of scholars' open and sharing practices	Western Europe and others	Teachers	2015			x										
Belikov, O.M.; Bodily, R.	Incentives and barriers to OER adoption: A qualitative analysis of faculty perceptions	Western Europe and others	Teachers	2016													x
Feldman-Maggor Y.; Rom A.; Tuvi-Arad I.	Integration of open educational resources in undergraduate chemistry teaching-a mapping tool and lecturers' considerations	Western Europe and others	Teachers	2016										x			x
Muganda C.K.; Samzugi A.S.; Mallinson B.J.	Analytical insights on the position, challenges, and potential for promoting OER in ODeL institutions in Africa	África	Teachers and Librarians	2016				x	x		x						x
Masterman E.	Bringing open educational practice to a research-intensive university: Prospects and challenges	Western Europe and others	Teachers	2016	x	x											

(Continuation)

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
Cox, G.; Trotter, H.	Factors shaping lecturers' adoption of OER at three South African universities	África	Teachers	2017	x												x
Cox, G.; Trotter, H.	An OER framework, heuristic and lens: Tools for understanding lecturers' adoption of OER	África	Teachers	2017								x					x
Mishra, S.; Singh, A.	Higher education faculty attitude, motivation and perception of quality and barriers towards OER in India	Asia-Pacífic	Teachers	2017							x	x					x
Zagdragchaa, B.; Trotter, H.	Cultural-historical factors influencing OER adoption in Mongolia's higher education sector	Asia-Pacífic	Teachers and Administrative Staff	2017				x	x	x				x			x
Santos-Hermosa G.; Ferran-Ferrer N.; Abadal E.	Repositories of open educational resources: An assessment of reuse and educational aspects	Various	Repositories	2017												x	
Hassall C.; Lewis D.I.	Institutional and technological barriers to the use of open educational resources (OERs) in physiology and medical education	Various	Teachers	2017													x

(Continuation)

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
Cooney C.	What impacts do OER have on students? Students share their experiences with a Health Psychology OER at New York City College of Technology	Western Europe and others	Teachers and Students	2017							x						x
Cronin C.	Openness and praxis: Exploring the use of open educational practices in higher education	Western Europe and others	Teachers	2017	x												
Stagg, A.	The ecology of the open practitioner: a conceptual framework for open research	Western Europe and others	Teachers	2017		x											
Beaven, T.	Dark reuse': an empirical study of teachers' OER engagement	Western Europe and others	Teachers	2018						x	x		x	x			x
Schuwer R.; Janssen B.	Adoption of sharing and reuse of open resources by educators in higher education institutions in the Netherlands: A qualitative research of practices, motives, and conditions	Western Europe and others	Teachers	2018								x		x			x

(Continuation)

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
Nascimbeni F.; Burgos D.; Campbell L.M.; Tabacco A.	Institutional mapping of open educational practices beyond use of Open Educational Resources	Western Europe and others	Teachers	2018	x												
Cardoso, P; Morgado, L.; Teixeira, A.	Open Practices in Public Higher Education in Portugal: faculty perspectives	Western Europe and others	Teachers	2019										x			x
Kumar A.; Singh M.	Exploring the use and practice of Open Educational Resources (OERs) in social science discipline with special reference to University of Delhi, Delhi	Asia-Pacífic	Teachers and Researchers	2019				x									x
Baas M.; Admiraal W.; van den Berg E.	Teachers' adoption of open educational resources in higher education	Western Europe and others	Teachers	2019				x		x							x
Pulker, H.; Kukulska-Hulme, A.	Openness reexamined: teachers' practices with open educational resources in online language teaching	Western Europe and others	Teachers	2020									x				
Baas, M.; Schuwer, R.	What About Reuse? A Study on the Use of Open Educational Resources in Dutch Higher Education	Western Europe and others	Teachers	2020				x		x		x					

(Continuation)

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
Alkhasawneh S.	Perception of academic staff toward barriers, incentives, and benefits of the open educational resources (OER) network (SHMS) at Saudi Universities	Asia-Pacífic	Teachers	2020							x						x
Santos-Hermosa G.; Estupinyà E.; Nonó-Rius B.; París-Folch L.; Prats-Prat J.	Open educational resources (OER) in the Spanish universities	Western Europe and others	Repositories	2020											x		
Oliver J.	Self-directed open educational practices for a decolonized South African curriculum: A process of localization for learning	África	Teachers	2020		x											
Kumar A.; Baishya D.; Deka M.	Open Educational Resources (OER) Issues and Problems Experienced by Social Scientists of Select Higher Educational Institutions in India	Asia-Pacífic	Teachers and Researchers	2021				x									x
Danekar M.S.S.; Lihitkar S.R.	User perception of Open Access Resources: A Survey of Department of Technology in Shivaji University, Kolhapur	Asia-Pacífic	Teachers	2021				x	x		x						

(Continuation)

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
Wiche H.I.; Ogunbodede K.F.	Awareness And Use Of Open Educational Resources By Library And Information Science Students Of Ignatius Ajuru University Of Education, Rivers State, Nigeria	África	Teachers and Students	2021				x									x
Schophuizen M.; Kreijns K.; Stoyanov S.; Rosas S.; Kalz M.	Does project focus influence challenges and opportunities of open online education? A sub-group analysis of group-concept mapping data	Western Europe and others	Teachers	2021		x											
Menzli L.J.; Smirani L.K.; Boulahia J.A.; Hadjouni M.	Investigation of open educational resources adoption in higher education using Rogers' diffusion of innovation theory	Asia-Pacífic	Teachers	2022													x
Marín V.I.; Zawacki-Richter O.; Aydin C.H.; Bedenlier S.; Bond M.; Bozkurt A.; Conrad D.; Jung I.; Kondakci Y.; Prinsloo P.; Roberts J.; Veletsianos G.; Xiao J.; Zhang J.	Faculty perceptions, awareness and use of open educational resources for teaching and learning in higher education: a cross-comparative analysis	Various	Teachers, Administrative Staff and Librarians	2022		x	x	x									x

(Continuation)

Author	Title	Region	Research Sample	Year	Q1			Q2				Q3			Q4		Q5
					a	b	c	a	b	c	d	a	b	c	a	b	a
Hettige S.; Dasanayaka E.; Ediriweera D.S.	Student usage of open educational resources and social media at a Sri Lanka Medical School	Asia-Pacífic	Teachers and Students	2022				x				x					x
Datt G.; Singh G.	Acceptance and Barriers of Open Educational Resources in the Context of Indian Higher Education	Asia-Pacífic	Teachers and Students	2022					x								x
Mićunović M.; Rako S.; Feldvari K.	Open Educational Resources (OERs) at European Higher Education Institutions in the Field of Library and Information Science during COVID-19 Pandemic	Western Europe and others	Teachers and Students	2023										x			x
Muniyasamy M.; Jeyshankar R.	Postgraduate Student's Open Educational Practices and Hurdles among Faculty of Science at Alagappa University during the Pandemic	Asia-Pacífic	Teachers and Students	2023					x		x						x
Stagg A.; Partridge H.; Bossu C.; Funk J.; Nguyen L.	Engaging with open educational practices: Mapping the landscape in Australian higher education	Western Europe and others	Teachers	2023	x												