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## Discoverability of OER: The Case of Language OER

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**Abstract.** One of the obstacles that prevent the widespread adoption of Open Educational Resources (OER) is the difficulty to find appropriate OER for specific educational objectives. This paper investigates this discoverability problem by searching for OER in eleven well-known Repositories of OER (ROER). The search for “Language Game” and “Italian Language” OER was used as a case study. The search found very few useful language OER in these ROER. Also, it revealed a number of obstacles in finding appropriate OER such as absence of a uniform structure of ROER, absence of a uniform OER metadata description, inaccurate, obsolete, and missing metadata descriptions of OER, obsolete OER, not really open and free educational resources, and more. Finally, the paper makes suggestions for improving both ROER and OER description.

**Keywords:** Find OER, language OER, OER, OER Repositories, Open Educational Resources, ROER, Search OER.

### 1 Introduction

During the COVID-19 pandemic, traditional education was heavily disrupted by the schools’ closure. Face-to-face and blended teaching were shifted to exclusively online teaching and all educational activities were performed online. However, teachers and students were not prepared for online teaching and learning. Furthermore, many students did not have access to textbooks or laboratories. In such a challenging and urgent situation, many researchers and organizations [1, 2] suggested the use of Open Educational Resources (OER) by teachers and students. OER are learning, teaching, and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license that permits no-cost access, use, adaptation, and redistribution by others [3]. Another definition requires the OER to meet the “5Rs Framework” [4] so that users are free to: 1) Retain: Users have the right to make, archive, and "own" copies of the content; 2) Reuse: Content can be reused in its unaltered form; 3) Revise: Content can be adapted, adjusted, modified or altered; 4) Remix: The original or revised content can be combined with other content to create something new; and 5) Redistribute: Copies of the content can be shared with others in

its original, revised or remixed form. Recent definitions further extended the OER abilities to include the following: freely and openly Find, Access, Store, Use, Create, Interact, Collaborate, Evaluate, Share, and Abandon OER without any Cost, at any Place and any Time [5].

OER are promoted by UNESCO [3] as a mean to meet Sustainable Development Goal 4 (SDG4) of the United Nations 2030 Agenda [6]. According to SDG4, all girls and boys should complete free, equitable and quality primary and secondary education. However, most students cannot have access to textbooks due to their high cost [7-9]. Parents' and students' inability to buy textbooks affects negatively students' learning as well as access to courses and graduation. UNESCO [3] trusts that OER can support quality education that is equitable, inclusive, open and participatory. In addition, OER can provide teachers with a wider availability of educational material to choose for teaching and learning [3]. UNESCO [3] recommended five areas of actions to facilitate OER adoption: i) Capacity building, capacity of education stakeholders to create access, re-use, adapt and redistribute OER; ii) Developing supportive policy; iii) Effective, inclusive and equitable access to quality OER; iv) Nurturing the creation of sustainability models for OER; and v) Facilitating international cooperation.

Similarly, European Commission [10] well recognized the value of OER to reduce the costs of educational materials and provide content adapted to the learners' needs. According to Timisoara Declaration [11], education should be open to all. This openness includes open access to digital resources and infrastructure as well as open access to people and professionals. It can be supported by OER. Timisoara Declaration was signed by ASLERD (Association for Smart Learning Ecosystems and Regional Development), EADTU (European Association of Distance Teaching Universities), EATEL (European Association of Technology Enhanced Learning), EDEN (European Distance and E-learning Network), IAFeS (International Association for e-Science). Furthermore, ICDE OER Advocacy Committee [12] recommends to support research and evaluation regarding OER work.

OER not only can save money [13] but they can also increase students' independence, self-reliance, satisfaction, and interest in the subjects taught as well as collaboration amongst learners and among teachers [14-17]. Furthermore, open textbooks could be of higher quality than copyright-restricted textbooks [18].

However, OER are yet to become mainstream due to various obstacles. These obstacles that prohibit OER broad adoption and use originate from the following sources: i) ROER-based obstacles, ii) OER-based obstacles, and iii) User-based obstacles. The following list presents the specific obstacles:

**ROER-based obstacles:**

- difficulty to find OER and ROER [15, 19-28];
- cost of developing and maintaining effective interoperable ROER [29, 30];

**OER-based obstacles:**

- low quality OER with respect to content timeliness, fit for purpose, usability, presentation, editing, multimedia and more [28, 31, 32];

- limited availability of appropriate and suitable OER for various subjects and levels [10, 20,21, 33];
- limited availability of OER in other languages beyond English [10, 34];
- OER incompatibility to local situation with respect to language, context, syllabus, students, etc. [33, 35-37];
- difficulty to adapt the OER to local situation [26, 38, 39];
- difficulty to sustain and keep on the existing OER updated and current [32];
- unclear or wrong copyrights of OER [20];
- difficulty to create an OER by combining and mixing OER that hold different copyrights & licenses [1];
- high cost of developing effective OER [34];
- lack of OER reviews, evaluations, quality assurance, certifications [19, 40];
- limited use of universally accepted educational metadata standards for the OER [41];

**User-based obstacles:**

- lack of awareness of OER [20-22, 36, 37, 42];
- lack of digital infrastructure and tools to use OER [34];
- lack of digital skills, OER skills, and open licensing skills [25, 26, 34, 43-45];
- difficulty to integrate OER in class [19, 22, 23, 26, 37, 43, 46-49];
- lack of teachers' support from the educational institutes with respect to absence of OER training, copyrights, rewards and compensation, etc. [33, 37, 48];
- attachment to the ordinary and unwillingness to try new things [8].

More specifically, regarding the OER discoverability obstacle, several previous studies underlined the difficulty to discover appropriate OER to satisfy specific educational goals [15, 19-28]. Even European Commission [10] alerted that it is difficult to find adequate OER and there is a need to make them more visible and accessible by all people.

More than half of 420 OER users in Asia pointed out that their inability to find specific and relevant OER was a serious obstacle in using OER [19]. Similarly, about 50% of thousands U.S. faculty had difficulties to find appropriate OER [20, 21, 28]. Likewise, more than 50% of thousands educators all over the world faced difficulties in finding suitable OER in their subject, knowing where to find OER, and finding high-quality OER [15, 23, 50]. In another survey, U.S. faculty stated that their inability to find OER was the second most significant barrier of adopting OER [22]. Also, educators in India expressed their inability to find OER on topics of interest [26].

A review of 51 previous studies on OER found that discovering OER was problematic due to misapplication of effective metadata that would ease the OER discoverability and sharing [25]. Finally, the Commonwealth of Learning (COL) make efforts to implement the OER discovery services of the Directory of Open Educational Resources (DOER) using open standards and technologies [27]. COL emphasized that institutional ROER should follow open interoperability standards.

This paper investigates the problem of finding appropriate language OER. The next section describes two cases of searching and finding language OER. Section 3 discusses the results while section 4 concludes and suggest directions for future research.

## 2 Method

After an extensive search in websites of universities' libraries, in the Registry of Open Access Repository (ROAR, <http://roar.eprints.org/>), and in the Directory of Open Access Repositories (Open DOAR, <http://v2.sherpa.ac.uk/opendoar/>), we identified well-known ROER (that contain language OER) and Directories of ROER (that contain links to language OER). Next, we will use the term ROER to mean both ROER and Directory of ROER. Major ROER that also curate language OER include the following in alphabetical order:

**COERLL** (<https://www.coerll.utexas.edu/coerll/materials/>): The Center for Open Educational Resources and Language Learning (COERLL)'s mission is to produce and disseminate language OER such as online language courses, reference grammars, assessment tools, corpora, etc. in more than twenty languages. Many of these OER have been evaluated and received a perfect score. It is the most well-known ROER that hosts and develops OER exclusively for foreign language teaching and learning.

**Curriki** (<https://library.curriki.org/>): It mainly concerns K-12 USA education. It offers OER for curriculum, lesson plans, apps, ebooks, full courses, games, slides, video etc. It is a K-12 global community for teachers, students, and parents to create, share, and find OER that improve teacher effectiveness and student outcomes.

**DOER (Directory of Open Educational Resources)** (<http://doer.col.org/>): The Commonwealth of Learning's (COL) designed DOER to help educators to find OER in the major ROER. It contains 114 language resources. More specifically, it contains links to 61 resources on language comprehension, 27 on language expression, 11 on grammar, 13 on vocabulary, etc.

**Merlot** (<https://www.merlot.org/merlot/WorldLanguages.htm>): It is a free and open online community of resources designed primarily for faculty, staff and students of higher education from around the world to share their learning materials and pedagogy. A lot of its OER are peer reviewed online learning materials, catalogued by registered members and experts. Also, most of its OER are Creative Commons licensed. It contains information for over 3,000 World Languages materials including 165 language courses. Specifically, it provides the following: 271 World Languages Open Textbooks; 130 Textbook + English Language Arts; 45 ELL + Language, Grammar and Vocabulary; 27 Language Education (ESL) + Textbook; 23 ESL + Textbook; 20 Language Instruction + Textbook; 36 Languages Textbook.

**MIT OpenCourseWare (OCW)** (<https://ocw.mit.edu/index.htm>): MIT OCW provides openly almost all MIT course content. There are at least 79 language courses. MIT Global Languages (21G) offers language classes that cover nine different global language and culture groups. It includes more than 130 courses not only on language but also on arts and culture.

**MOM (Mason OER Metafinder)** (<https://oer.deepwebaccess.com/oer/desktop/en/search.html>): It is a search engine that searches 22 different sources such as the well-known ROER Merlot, OER Commons, OpenStax. Regarding foreign language, it provides 1,120 results including 519 books and 27 e-books.

**OASIS** (<https://oasis.geneseo.edu/>): COL developed Openly Available Sources Integrated Search (OASIS) to facilitate the discovery of OER in different media formats.

OASIS currently searches open content from 117 different databases and contains 388,707 records in a variety of subjects. It provides 823 language OER.

**OER Commons** (<https://www.oercommons.org/>): It contains over 50,000 OER in various languages and format: Audio, Braille/BR, Downloadable docs, eBook, Graphics/Photos, Interactive, Mobile, Text/HTML, Video. There also curated OER Commons Collections on specific subjects as well OER Commons Hubs (network of users who can create and share collections, administer groups, and share news and events associated with a project or organization). Regarding language OER, it provides 1,725 OER including 36 Language Instruction; 38 Language + Full Course; 13 Language Education (ESL) + Full Course; 1,158 CCSS (Common Core State Standards) Aligned English Language Arts collections.

**OpenStax** (<https://openstax.org/>): It has a large collection of peer-reviewed open textbooks on a large variety of subjects. These textbooks are being used in over half of U.S. college and universities and in over 100 countries. It has published 42 titles for college and high school courses across science, math, social sciences, business and the humanities disciplines since 2012. More than 36,00 instructors worldwide have adopted an OpenStax textbook and 14 million students have exploited its textbooks. There are not any language textbooks.

**Open Textbook Library** (<https://open.umn.edu/opentextbooks/subjects/languages/>): It offers more than 700 peer-reviewed open textbooks to be freely used, adapted, and distributed. It provides 48 language textbooks.

**OpenLearn** (<https://www.open.edu/openlearn/>): The Open University supports OpenLearn which offers over 1,000 free courses, interactives, quizzes, videos, audios, etc. It includes 75 language courses with 60 language e-books and 57 language videos.

At a first glance, it seems that there are various alternatives to find appropriate OER for teaching and learning a specific subject. However, the reality is far away from this wish. This paper will further investigate the availability of OER for teaching and learning a foreign language. It looks that some ROER provide access to a variety of language OER (e.g., 488 OER for teaching & learning Spanish in Merlot [51]). However, searching for a specific language (even a popular language, e.g., Italian), a specific proficiency level, a specific students' age, a specific learning objective (e.g. pronunciation, grammar), a specific type (e.g., video) it is extremely difficult to find any suitable OER. Even searching many well-known ROER with every possible combination of keywords or even looking OER by OER in these ROER, there are not a lot of results.

In order to examine in a planned way, the availability and the easiness of finding language OER in these well-known ROER, we designed two experiments. In the first case, we tried to find “Language Game” OER. In the second case, we tried to find “Italian Language” OER. The results are depicted in Table 1.

**Table 1.** Discovering “Language Game” & “Italian Language” in ROER.

| <i>ROER</i> | <i>Language Games OER</i> | <i>Italian language OER</i> |
|-------------|---------------------------|-----------------------------|
| COERLL      | -                         | 3                           |
| Curriki     | 16                        | 3                           |

|                              |  |   |
|------------------------------|--|---|
| <b>DOER</b>                  | 2  | 8   |
| <b>Merlot</b>                | 131 (World Languages + Simulation);<br>421 (World Language + “Drill and Practice”) | 51 (World Languages/ Italian materials);<br>42 (“Italian Language” materials) |
| <b>MIT OCW</b>               | -  | 1 course  |
| <b>MOM</b>                   | 364  | 894   |
| <b>OASIS</b>                 | 2  | 5   |
| <b>OER Commons</b>           | 14 (“Language Education (ESL)” + Game)   | 1 (“Language Education (ESL)” + Italian)                                      |
| <b>OpenStax</b>              | -  | 1   |
| <b>Open Textbook Library</b> | -  | 3 open textbooks  |
| <b>OpenLearn</b>             | -  | 3 courses, 2 podcasts, 1 test   |

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Although the meta-search engines of Merlot and MOM found many results, most of them are not relevant to the search criteria or exhibit other problems that will be discussed in the next section. The rest ROER present none or very few OER. If we also put some extra filters with respect to students’ age, learning objective (e.g. pronunciation), media (e.g., video) etc. then it is extremely difficult to find any suitable OER. In the next section, we further discuss the problems faced in searching these ROER. We also make recommendations for improving both the structure of the ROER and the metadata description of the OER.

### 3 Discussions

In this section, we further describe problems faced in discovering OER and make suggestions for overcoming such problems. No matter how sophisticated the search engines in the ROER are, manual investigation of the search results is still needed. Many of the search results are irrelevant to the search keywords. Problems and suggestions are presented as follows:

- 1. Huge number of different disconnected ROER:** All over the world, almost every educational institute and organization (national or international) has its own independent ROER to serve its potential users. All these thousands ROER are isolated and not interconnected. *Suggestions: Develop a meta-search engine that is able to both find and search simultaneously all these ROER.*

2. **Not a uniform structure and organization of all ROER:** Each ROER has different objectives, serves different users (e.g., age, subject/discipline, language, learning objectives, needs), and organizes differently its OER. Almost every ROER has a different structure and organization. Suggestions: *Develop an open standard to describe the structure and organization of ROER that will be easy to be linked to other ROER and for meta-search engines to search it. Promote this standard and motivate ROER to adopt and apply it.*
3. **Not a common OER metadata description across all ROER:** Most ROERs do not adopt an open educational metadata standard to describe their OER. On the contrary, they describe their OER metadata in their own way. Although there are open educational metadata standards (e.g., LOM, SCORM, IMS) not all ROER use them [41]. Even worse, Repositories that use such standards to describe the OER, very often mix different metadata standards in the same Repository [41]. Suggestions: *Develop an open educational metadata standard to describe OER that is both usable and effective. Promote this standard and motivate ROER to adopt and apply it.*
4. **ROER in different languages:** In every country, the educational institutes and organizations develop ROER in the local language. However, it is difficult to explore and search Repositories in a language that you do not speak. Although contemporary browsers may provide automatic translation to your language, most menus titles cannot be translated. Furthermore, a meta-search engine should be able to search these multilingual ROER and find OER in any language. Suggestions: *Develop an open standard to describe the structure and organization of ROERs in any language that can be searched by a search engine in any language. Develop an open educational metadata standard to describe OER in any language that is both usable and effective. Promote these standards and motivate ROER to adopt and apply them. Develop a meta-search engine that is able to both find and search simultaneously all multilingual ROER in any language.*
5. **Inaccurate search results at ROER:** Many of the search results in ROER are not accurate. For example, searching for “language game”, the results include computer languages (e.g., C++) or philosophical issues on language. Also, another problem appears when a resource is composed from several components. In this case, an ROER or a meta-search engine may consider it either as a single OER or as many different OER. So, the number of search results is not always an accurate index regarding the quantity of resources in a topic. For example, a course may be composed from one or more textbooks, tenths of chapters, videos, lessons, texts, cases, examples, exercises, questions, assignments, quizzes etc. So, the search results can show not only this single course but tenths of related materials to this course. For example, the Mason OER Metafinder (MOM) provides 100 OER results to searching “Italian language” at the MIT OpenCourseware. However, these 100 OER correspond to just two OER courses at the MIT OpenCourseware. Suggestions: *Develop an open educational metadata standard to describe OER in any language that is both usable and effective. This standard should allow the exact description of the OER linked to its modules but without excessive workload*

for the people who curate it. However, it is a difficult problem to accurately describe the OER with the least effort. Promote this standard and motivate ROER to adopt and apply it.

6. **Very few OER in many ROER:** Since most ROER serve specific local users and have limited budget and resources, they cannot curate a large number of OER. Suggestions: *Promote the idea of OER all over the world. Motivate, interconnect, and train teachers and others to develop OER and populate ROER. Promote the interconnection among all ROER and the adoption of open standards.*
7. **Inaccurate and incomplete metadata description about the OER:** The OER metadata are filled by people. In some cases, these people do not fill in some metadata or they fill inaccurate information. For example, an OER was described as a game, but it was a kind of quiz. In other cases, there is no information regarding copyrights (e.g., “Not specified” or “Unknown”). Suggestions: *Develop an open educational metadata standard to describe OER in any language that is both usable and effective. Train the people who catalogue and curate OER in ROERs. Periodically reconsider and check the metadata of all OER in the Repository.*
8. **“OER” which are not really open and free:** In many cases, although an OER was described as being open and free, in reality there was a cost to use it. More specifically,
  - a. Some resources are no longer OER, e.g., Merlot lists as OER the MFL Games (<https://www.merlot.org/merlot/viewMaterial.htm?id=86589>). However, this is now a company called español eXtra (<https://www.espanolextra.com/>) and it uses subscriptions as a revenue model;
  - b. Some resources are free for a sample of introductory material (e.g., one lesson, one quiz, one short video) and the rest material has to be paid e.g., español eXtra (<https://www.espanolextra.com/>), Transparent Language (<https://www.transparent.com/>), German Language Games (<https://www.pimsleur.com/>);
  - c. Some resources are free for a trial or for a limited time, e.g., Mango Languages (<https://mangolanguages.com/>);
  - d. Some resources are free but they contain advertisements, e.g., GameZone (<https://www.english-online.org.uk/games/gamezone2.htm>), 50Languages (<https://www.50languages.com/>), ESLGames (<http://www.eslgamesworld.com/>);
  - e. Some resources are free but they require to give your Name and Email in order to send you the resource.

Suggestions: *Catalogue only real OER. Periodically reconsider and check the openness of all linked OER in the Repository.*
9. **Obsolete OER (including links):** In several cases the content or/and the technology used to create the OER are obsolete. For example, several OER use Flash technology. However, Adobe does not support any more Flash. Also, in several cases, the ROER provided links to OER that did not exist, e.g., Broken links, “domain for sale”, “App Not Available”, “This app is currently not available in your country or region”, “Forbidden: You don't have permission to access this resource”, “This site can't be reached”, “ERROR\_DEFAULT\_404 PAGE NOT FOUND”. Such



obsolete information to non-existent OER were even given for information that have been recently updated (e.g., the label “Date Modified in MERLOT” states a recent date) e.g., LinguaWeb (<https://www.merlot.org/merlot/viewMaterial.htm?id=89572>) has been updated on September 24, 2020 and points to <http://www.linguaweb.com/?f> which does not exist on February 24, 2021 (“This domain is for sale. You can buy it right now!”). *Suggestions: Periodically reconsider and check for any changes in the OER metadata and remove any obsolete OER from the Repository.*

## 4 Conclusions

Despite the cost savings and other benefits that OER bring, their widespread adoption by educators and schools remains to be seen. One serious obstacle to OER becoming mainstream is the difficulty to discover quality OER that are appropriate for specific educational objectives. This paper presents the results of searching for language OER in well-known ROER. Then it records the problems faced and makes suggestions for improving the ROER and the OER description.

Administrators of ROER worldwide would collaborate and agree to adopt a common standard for the structure and organization of their ROER as well as a common educational metadata standard for the OER. Also, they should collaborate, train, and motivate curators, authors (creators), teachers and others to develop, evaluate, and catalogue quality OER for various audience, languages, subjects, educational levels, material types, format, media, etc. Future research may investigate the discoverability of OER for other languages and other subjects (besides language OER).

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