

How Can Open Educational Resources Promote Equity in Education?

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Abstract: Currently, the growth and development of Open Educational Resources (OER) offers the opportunity to improve access to and transfer of knowledge and information. As such, the adoption of OER has often been associated with social equity, as it helps students overcome educational inequalities regarding access, participation, and results in the various formal learning contexts. This document therefore explores how OER can be used to promote social inclusion and equitable access to education. A literature review was carried out that analysed 20 documents on the promotion of equity in education through OER, identifying the opportunities and barriers in this regard and concluding that the use of OER in education must always consider the needs of students in order to truly contribute to equity. With this in mind, a number of strategies were identified, such as the provision of Internet and ICT, the development of digital literacy programmes and training and guidance in searching and filtering OER, to maximize the potential of OER in promoting equity, in order to achieve inclusive, equitable and quality learning and education.

1 INTRODUCTION

The technological evolution of computers and the Internet has facilitated the production of learning resources, resulting in a large quantity of materials and resources that can be freely shared between institutions and individuals. As a result, Open Educational Resources (OER) have emerged (Atenas & Havemann, 2014).

UNESCO (United Nations Educational, Scientific and Cultural Organization) defines OER as "teaching, learning and research materials in any medium - digital or otherwise - that reside in the public domain or have been released under a license that allows access, use, adaptation and redistribution at no cost by others, without restrictions or with limited restrictions" (UNESCO, n.d.).

According to the Innovating Pedagogy 2021 report (2021), developing inclusive educational opportunities requires thinking not only about equal opportunities to access education, but also about equity, whereby every student can achieve similar positive results, regardless of their background and

characteristics such as gender, disability or ethnicity. Also according to this report, strategies in equity-oriented pedagogy include listening to students and adapting teaching, recognizing the unequal impacts of the use of educational technology and awareness of how unfair assessment practices can be.

OER can include a wide variety of contents, such as books, complete courses or parts of courses, modules, research articles, tests, videos, games, texts, software and any other tool, material or technique that can support access to knowledge (Furniel, Mendonça & Silva, 2020), that allow them to be freely used, shared and adapted by others, and that guarantee the right to inclusive and quality education for all (Bliss & Smith, 2017). With this, it is easy to see that OER do not require the payment of access fees (Butcher, 2015), which helps to save on the costs associated with education, reducing financial barriers.

Thus, OER are a means of promoting the dissemination of knowledge more widely, increasing the pace of development and, additionally, increasing the quality of education and reducing social inequalities, contributing to more equitable learning.

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The development and use of OER should enable learning experiences for all students, allowing people of all abilities to access the content provided (Hoosen & Butcher, 2019). Pereira, Rosa and Nobre (2016) complete these statements, assuming that OER are "enrichers of the overall educational project and facilitate access to knowledge, de-territorializing it, without physical limitations and without its traditional exclusive association with the formal school environment".

With this in mind, this study aims, through a literature review, to explore how OER can contribute to equity in education, highlighting the benefits and challenges associated with their use and discussing strategies to improve equity in the use of OER.

2 METHODOLOGY

The Scopus database was used to carry out this literature review, using the following keywords: "open educational resources" AND "equity". For the selected documents to be relevant to the aim of the study, the following inclusion criteria were used: i) to be written in Portuguese, English or Spanish (languages understood by the researchers); ii) to have been published in the last 25 years, in order to obtain relatively up-to-date perspectives on the subject; and iii) to present relevant information on the promotion of equity in education through OER. On the other hand, all documents that were not open access were excluded. The selected articles and book chapters went through a screening and selection process (Figure 1) which included careful reading of the text, with an emphasis on the sections that addressed the promotion of equity in education through OER.

To present the results (chapter 3), a more narrative approach was chosen, guided by the need to provide a deeper and contextualized analysis of the main themes, trends and conclusions identified in the literature review. Through this structure, we seek not only to present the results of the literature review carried out, but to place them within a broader context.

3 FINDINGS AND DISCUSSION

3.1 Open Educational Resources

For Wiley (2020), OER are teaching, learning and research materials that can be copied, edited and shared freely and legally. Thus, the big difference between an OER and other types of educational

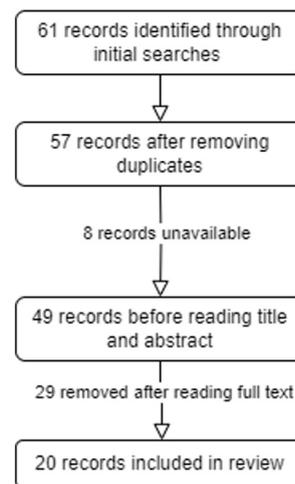


Figure 1: Overview of screening and selection process.

resources is that OERs are based on the open license principle, allowing five forms of freedom for these learning objects. According to Wiley & Hilton (2018), these forms of freedom constitute the 5Rs of OER and are as follows:

- Retain: the right to download, store and own personal copies of OER.
- Reuse: the right to use content in different ways and for different purposes.
- Revise: the right to adapt, adjust, modify or alter the content of a resource.
- Remix: the right to combine original or adapted content with other open content to create a new resource.
- Redistribute: the right to share copies of original, revised and/or remixed content.

Retention and usage rights allow OER to be used without access fees, which is a benefit in that students can access them, and teachers or instructors can incorporate these materials into their classes (Watson et al., 2017).

With revision rights, changes are possible, such as translating the materials into other languages or audio adaptation, removing parts of the materials, considering what is or is not relevant to the learning objectives of those using the materials. Thus, the options for revising OER facilitate their access to diverse populations (Clinton-Lisell, Legerski, Rhodes & Gilpin, 2021).

Remixing provides teachers and instructors with the ability to adapt materials according to their teaching needs (Remillard, 2005). Furthermore, the right to remix, combined with the right to revise, contributes to improving the inclusion and diversity of materials.

Finally, redistribution favors networking and collaboration between authors and users who may be interested in creating and/or using more inclusive and diverse OER (Nascimbeni & Burgos, 2016).

The use of OER is increasingly common these days, and one of the factors that leads the population to adopt this type of resource is, in addition to the rights presented, affordability and ease of access (Pelletier et al., 2021). With the emergence of the COVID-19 pandemic, the need for OER has grown, as they can be accessed from anywhere and from any device (Pelletier et al., 2021).

3.2 The Relationship Between OER and Equity

In addition to the benefits of OER already presented, one of the great advantages of this type of resource should be equity. But do OER contribute to increasing social equity among students?

The Paris OER Declaration (2012) states that OER can be used in favor of student education "thus contributing to social inclusion, gender equity, as well as teaching with specific needs".

According to UNESCO (2015), access, equity, inclusion and quality in learning outcomes are essential elements in access to education, which is a fundamental human right. Thus, the development of any type of inclusive educational resource or material, including OER, imposes the need to ensure equal opportunities for access to education, as well as the need to focus on how the resource can lead to equity and social justice in results and teaching.

In an article by Willems & Bossu (2012) in the journal *Distance Education*, it is understood that equity in education refers to the access, participation and results (as cited in Coram, 2007) of different social groups (as cited in Vick, 2001) or individuals (Santiago, Tremblay, Basri, & Arnal, 2008) in education, and relates to the fair distribution of educational resources and services. On the other hand, the OECD (Organization for Economic Cooperation and Development) (2007, pp. 48-49) adds to this by stating that equity in education "has two dimensions: the first is fairness, which implies ensuring that personal and social circumstances - for example, gender, socio-economic status or ethnic origin - should not be an obstacle to the realization of educational potential; the second is inclusion, which implies ensuring a minimum standard of education for all - for example, that everyone should be able to read, write and do simple arithmetic." The OECD explains that these dimensions are related, in that

combating school failure helps to overcome the effects of the social exclusion that often causes it.

Considering the benefits associated with the adoption of OER in educational contexts, it can be concluded that these resources are advantageous for both students and teachers, since:

- i. benefit students from all social backgrounds, as they are easily accessible.
- ii. give students flexibility because they can use OER anywhere at no extra cost.
- iii. allow interaction with the content and sharing of knowledge between students, or even between teachers.
- iv. enable students to become more engaged and autonomous in their educational process, through the control they have over their own learning materials.
- v. allow students and teachers to explore new ways of teaching and learning, encouraging creativity and innovation in the use of educational materials.
- vi. they can be a complement for the teacher, by being able to use these materials in class; and for the student, by allowing them to deepen their knowledge and understanding of a subject.
- vii. allows teachers to take advantage of the materials to consolidate knowledge or use them in and out of class, making it possible to adapt and customize them.
- viii. saves teachers some time in preparing materials.
- ix. by promoting the reuse and sharing of existing educational resources, OER contribute to environmental sustainability by reducing the waste of paper and other resources.

In this sense, some of the advantages of these resources are related to equity, as they help to reduce disparities in access to knowledge and quality of education, and enabling "all students to have the opportunity to obtain fair and comparable results", regardless of their socioeconomic context or geographic location (Kukulka-Hulme et al, 2021, p. 27).

However, it is obvious that, despite the clear advantages of OER, these resources, associated with the 5Rs, also have challenges and disadvantages associated with them, especially at a time when the Internet is full of information (Chicaiza et al., 2017), where the use of large language models shows how credible but non-existent references are generated (Agrawal et al., 2023), representing a significant risk for those who trust content generated in this way.

In this sense, and not directly mentioning equity now, it is essential to highlight two challenges related to the effective use of OER: i) the complexity of copyright licenses and the lack of clarity about how OER can be legally used and adapted can discourage their use (McGreal, 2012); e ii) the existence of advanced linguistic models on the internet can proliferate false information, making it appear credible and easily confused with real information (Pacheco, 2023). As a result, users can be exposed to misleading content, compromising the integrity of the educational process and undermining the construction of solid, reliable knowledge. Therefore, it is extremely important to develop quality OER (Zulaiha & Triana, 2023), associated with digital literacy education (Maphosa & Bhebhe, 2019) and orientation/training in OER search (Kanwar, Kodhandaraman & Umar, 2010). This will ensure that educators and students can safely identify and use reliable and relevant resources, increasing the quality of education through OER.

When adopting this perspective of using OER to contribute to equity, it is also important to consider the presence of some challenges in this direction, namely: i) that "not all OER are completely open, not all learners have access to computers, or the Internet" (McGill, 2010, p. 1) or other technological devices, which means that they cannot reach the resources, even though they are available; ii) that although most OER are available in English, not all students are fluent in this language (Petrides, Nguyen, Kargliani, & Jimes, 2008); iii) that the content of OER needs to be adapted to fit the various contexts of different countries, or even of different schools and universities in the same country (Matkin, 2009); iv) that access to technology is still an obstacle for many students (Willems, 2005), and that is why it is so important for students to have access to technology; v) not every student has the ability to identify and select the most appropriate or high-quality resources (Sucunuta, Riofrio & Tovar).

It is therefore essential to find solutions and tools so that students can use the technology that allows them to access OER. It is also necessary to ensure that "materials will be accessible on alternative technologies, including mobile technologies" (McGill, 2010, p. 1) to allow authentic access to OER for all and achieve equity.

All of the challenges identified must be addressed by identifying and implementing strategies that address these challenges in order to guarantee the effective use of OER and ensure equity in education.

In this sense, the members of the equity working group of Driving OER Sustainability for Students

Success (DOERS3) have developed a comprehensive self-assessment tool that aims to guide students, teachers, professionals and other stakeholders to understand and act on the equity dimensions of OER, towards a better understanding by acting on the equity dimensions of OER - Equity Through OER Rubric (DOERS3, 2021). In addition, they have developed guidelines on how to apply the equity component in OER.

This rubric is part of a project by the same organization, The OER Equity Blueprint, which defines equity as a "corrective process that demands justice for marginalized and minority populations by reducing opportunity and achievement gaps through systematic efforts" (DOERS3, 2021, p.1). This project also explains through evidence found in other research that OER reduce education costs, deepen learning and improve student persistence levels.

The Equity through OER rubric has the goal of enabling users to integrate OER equitably in higher education, leading to fair and quality access, outcomes, and student success, and makes it possible to assess the level of equity in the adoption of OER in institutions.

Therefore, by following the steps in this section, it is possible to determine whether the OER meets equity requirements, thus identifying areas for improvement. This evaluation is crucial to correcting disparities in opportunities and achieving equitable outcomes. Developing and using OER with this type of evaluation in mind can help reduce some of the challenges associated with these resources.

3.3 Discussion of Results

The results presented in this study highlight the significant potential of Open Educational Resources (OER) to promote equity in education, while also highlighting the challenges that need to be overcome in order to maximize their impact.

Firstly, it is important to recognize the many benefits associated with the adoption of OER. The freedom offered by OER, exemplified by the "5Rs", provides students and educators with a wide range of possibilities for using and adapting educational materials. This not only promotes accessibility and flexibility in teaching and learning, but also stimulates pedagogical innovation and saves time and resources for teachers.

However, the reality of equity in the adoption and use of OER still presents significant challenges.

Although OER are theoretically accessible to everyone, regardless of their socio-economic

background, there are practical barriers that need to be addressed.

According to the *Innovating Pedagogy 2021* (2021) report, to combat the gaps often found in the likelihood of school success related to ethnicity or forms of disability, the adoption of innovative approaches such as OER as a way of providing opportunities to achieve fair and comparable results has become increasingly common. The authors of this report also add that one conclusion of the efforts being made to make education accessible to all is that "one size does not fit all", so equal access is not an unique method of solving equity problems.

Therefore, while OER can play an important role in promoting equity by providing open access to educational materials, a continuous effort is needed from the school community to address the specific barriers and challenges that prevent equitable access to education. Equity of access to OER can only be achieved by working together and taking a context-sensitive approach to meet the diverse needs of students. To achieve this, it is essential to listen to the students and adapt the OER to allow the student's needs and life experiences to be incorporated into their learning method (Kukulska-Hulme et al., 2021).

In fact, the existence of OER evaluation tools, such as the one discussed above, is essential to alleviate some of the challenges associated with these resources, namely the identification of relevant and quality resources (Elias et al., 2020). However, other challenges remain.

Since access to OER generally depends on access to the internet and a computer or other devices, to overcome the barrier of lack of access to these means, it is useful to integrate these resources into school or university libraries, since library resources and services are available to all students, regardless of, for example, ethnicity or financial situation. Thus, the OER Paris Declaration (2012) recommends promoting ICT (Information and Communication Technologies) strategies and providing connectivity and access to ICT for students and staff in education systems, since accessing and sharing these resources is usually done through ICT.

In order to improve the equity of OER, it is important to clarify the difference between the terms "equity" and "equality" for OER authors. Although both are important in this context, equality seeks to treat everyone in the same way, regardless of their needs; while equity treats people in different ways, recognizing their needs and what each person needs.

Since the principles of OER are freedom of dissemination, reuse and adaptation, and since it is possible to create different versions of the initial

ideas, it is possible to obtain different resources on the same topics, changing formats, languages, technical support and pedagogical character. In this way, to achieve equity, teachers can adapt OER according to the needs of each student. This makes it possible to obtain different formats of the same content according to the needs of the students.

In addition, "teaching professionals need to build and improve new skills that help them in the teaching/learning dynamic" (Nobre and Mallmann, 2016, p. 154), to keep up with the potential of OER brought about by technological advances and evolution in the educational context.

Finally, the fairness of OER can and should also be guaranteed by training teaching professionals and OER creators to improve the use of OER. This could be done through training and motivation actions for teachers, legislators, educators, students, etc. "with a view to producing and sharing high-quality and accessible educational resources, taking into account local needs and the full diversity of learners" (Paris OER Declaration, 2012, p. 2). This training could be done through open videos and MOOCs (Massive Open Online Courses) that explain how to develop and use OER considering the needs and difficulties of different types of learners.

In short, to achieve equity in OER, it is essential to equip students and teaching professionals with equity-oriented strategies to improve teaching, considering the needs of each student. Some proposals for this equipment include:

- i. Identifying students' skills, interests and needs by listening to them. This can include, for example, working on answering specific questions that will later allow the teacher to identify these aspects in each student. By understanding the individual needs of each student, educators can personalize teaching, ensuring that everyone has fair opportunities to learn (Amzil, Aammou & Zakaria, 2023).
- ii. Understanding the various types of barriers (cultural, social, economic, heritage) to achieving results. Recognizing these barriers is key to creating an inclusive and equitable environment (Hollings, 2021).
- iii. Adapting and adjusting the OER based on these needs and barriers, and according to the needs of each student, thus obtaining different formats of the same content to apply according to the needs of each student. This adjustment and adaptation allows educators to provide personalized support, ensuring that all students can access and

- benefit from the content (Luis, Intriago & Cadenas, 2019).
- iv. Training for teaching professionals and OER creators, explaining how to use and develop OER considering the needs and difficulties of each type of student. This provides OER creators with strategies that will guide them in creating equitable resources, considering the diversity of needs of various students, promoting inclusive and equitable practices. (Okonkwo, 2012).
 - v. Provision by the educational institution of access to internet and ICT, so that students unable to access it at home can access OER at school or university. This guarantee is key to eliminating disparities in access to OER and promoting equitable learning opportunities (National Center for Education Statistics, 2018).
 - vi. Develop training and digital literacy programs for students and families, enabling them to effectively use technology to access available resources (Maphosa & Bhebhe, 2019).
 - vii. Assist students in translating OER that are not available in their language. This will allow language barriers to be overcome, ensuring that all students can understand and benefit from the content of the OER, regardless of the language in which it was originally written (Beaven et al., 2013).
 - viii. Provide guidance and training on how to search for, evaluate and select suitable, high-quality OER for different purposes and areas (Chicaiza et al., 2017). This guidance allows students and teachers to make informed choices regarding the selection and filtering of OER, ensuring that everyone has access to relevant and effective OER.
 - ix. Promote media education and critical thinking from an early age, teaching students to assess the credibility of online information sources (Šmakić, K, 2016).
 - x. Educate educators and students about the different types of copyright licenses and their implications, and provide guidance and resources on how to use and adapt OER according to the specific licenses, enabling them to use the resources legally and ethically. (Fong & Por, 2014).

The application of these proposals can help to reduce the challenges related to equity in OER, contributing to effective use of OER and promoting equity in education.

4 CONCLUSIONS

This study has demonstrated the importance and potential of OER in promoting equity in education.

In fact, considering the benefits of OER, these resources can be highly effective in promoting equity in education, when applied correctly. However, to achieve this goal, it is crucial to overcome the challenges and obstacles identified.

OER offer opportunities to improve learning outcomes, reduce the costs of education and increase the quality of teaching by enabling the sharing of resources. By allowing free access to high-quality educational materials and flexibility in the use, adaptation and distribution of these resources, OER have the power to reduce disparities in access to knowledge and the quality of education.

However, it is crucial to recognize that promoting equity through OER faces significant challenges, such as lack of access to technology, lack of digital skills, language barriers and difficulties in identifying and selecting relevant and appropriate materials. To overcome these obstacles and maximize the potential of OER in promoting equity, it is necessary to adopt a comprehensive and equity-oriented approach, namely through the use of OER evaluation platforms, the promotion of access to quality teaching materials that are inclusive and adaptable to students' needs, and also the development of digital literacy programs, the provision of internet and ICT resources, and the empowerment of educators and students in finding and filtering OER.

This paper also concludes that the use of OER in education must always consider the needs of students in order to truly contribute to equity. In this sense, by implementing these and other student-focused strategies identified in the previous chapter, educational institutions can create an equitable environment where all students have equal access to quality educational resources. Thus, OER adopted in educational contexts can improve the quality of teaching by providing equal learning opportunities, if applied correctly.

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