



## **The Contribution of Open Educational Resources in Institutional Repositories to the Promotion of Sustainable Development Goals (SDGs) - 4: a Study at the Faculty of Computing at the Federal University of Uberlândia**

*The contribution of open educational resources in institutional repositories to the promotion of Sustainable Development Objectives (ODS) - 4: a study at the Faculty of Informatics of the Federal University of Uberlândia*

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### **Summary**

This study aims to analyze the contribution of Open Educational Resources (OER) made available in the Institutional Repository of the Federal University of Uberlândia (UFU) to the promotion of Sustainable Development Goal 4 (SDG 4), which aims to ensure inclusive, equitable, and quality education. The research was conducted at the UFU School of Computer Science with the participation of faculty and students. It revealed that, although there is familiarity with OER—especially video lectures and multimedia content—effective use of the repository remains limited. Among the main challenges are a lack of knowledge about the platform, navigation difficulties, and a lack of integration of OER with pedagogical practices.

**Keywords:** Open Educational Resources. UFU Institutional Repository. Sustainable Development Goals (SDGs). SDG 4 - Quality Education.

### **Summary**

This study seeks to analyze the contribution of the Open Educational Resources (REA) available in the Institutional Repository of the Federal University of Uberlândia (UFU) to the promotion of Sustainable Development Objective 4 (SDG 4), whose objective is to guarantee an inclusive, equitable and quality education. The investigation, carried out at the Faculty of Informatics of UFU, with the participation of teachers and students, revealed that, if there is already a generalized knowledge of REA, especially video classes and multimedia content, the effective use of the repository is limited. Among the main challenges are the lack of knowledge of the platform, navigation difficulties and the lack of integration of REA into pedagogical practices.

**Keywords:** Open Educational Resources. UFU Institutional Repository. Sustainable Development Objectives (SDG). SDG 4 - Quality Education.

## **1. Introduction**

Education is recognized as a fundamental element for development sustainable, as long as it goes beyond exclusively economic perspectives. Aligned with UN 2030 Agenda, Sustainable Development Goal 4 (SDG 4) highlights the importance of ensuring inclusive, equitable, and quality education. In this scenario, Open Educational Resources (OER) and Institutional Repositories (IR) play a strategic role in democratizing access to knowledge.

OERs, based on open access and licenses such as Creative Commons, Commons expand teaching and learning opportunities by reducing barriers financial and geographic. RIs function as digital libraries that store and disseminate academic production, also assuming a political function by integrating information networks and support open access policies.

Free access to educational resources is an essential requirement for democratic, quality, sustainable and open education, in any modality (in-person, distance, hybrid) and at all levels of training. (OTSUKA et al, 2015)

The study focuses on the Faculty of Computing at the Federal University of Uberlândia (UFU), analyzing how the OER present in the institutional repository contribute to SDG 4. The challenges of teacher training, curation of materials and strengthening the institutional culture focused on open education. The research highlights the potential of OER and IR to promote pedagogical innovation, equity and sustainability in higher education, especially in contexts that demand constant technological updating.

Thus, the general objective of the research was to analyze the contribution of the Resources Open Educational Resources (OER) present in institutional repositories for the promotion of Sustainable Development Goals (SDG) 4 - Quality Education in Faculty of Computing of the Federal University of Uberlândia.

The implementation of Open Educational Resources (OER) in repositories institutional practices have proven to be a fundamental practice for promoting access to quality teaching materials and to promote inclusive and equitable education. Open Access (OA), which allows the free dissemination and use of content academics, directly aligns with the Sustainable Development Goals, particularly with Sustainable Development Goal (SDG) 4 - Education Quality, which seeks to guarantee quality, inclusive and accessible education for all.

## 2. THEORETICAL FRAMEWORK

Open Educational Resources (OER) are teaching, learning and and research made available under open licenses that allow their use, adaptation and

free redistribution. Since the early 2000s, driven by initiatives such as UNESCO, Creative Commons, and MIT's OpenCourseWare, OERs have been gaining highlighted as a strategic tool to democratize access to education and foster the collaborative production of knowledge.

teaching, learning and research materials in any form, digital or otherwise, that are in the public domain or that have been released under an open license that permits free access, use, adaptation and redistribution by third parties, with no or few restrictions. (UNESCO, 2002)

With technological evolution and the growth of digital culture, teachers and institutions began to seek online resources to address deficiencies in materials traditional. However, there are still challenges related to copyright, It is essential to distinguish between free and truly open content, with licenses clear usage.

Institutional repositories emerge as essential infrastructure for store, organize, preserve, and disseminate OER. Furthermore, they promote visibility to academic production and encourage the reuse of materials, optimizing educational investments. In Brazil, public policies such as the National Education Plan Education (PNE) and the National Digital Education Policy (PNED), in addition to the Ordinance CAPES nº 206/2018, strengthen the use of open educational technologies in teaching.

The adoption of OER is directly aligned with the Development Goal Sustainable Development Goals (SDG) 4 – Quality Education, from the UN 2030 Agenda, which aims to ensure inclusive, equitable, and quality education for all. Universities and Libraries play a central role in this process, promoting pedagogical practices innovative, continuing education for teachers and institutional policies that encourage culture of open education.

Thus, the integration between OER and institutional repositories represents a effective way to transform higher education into a more accessible environment, collaborative and aligned with the principles of sustainable development.

## **2.1. OPEN EDUCATIONAL RESOURCES (OER): PRINCIPLES FUNDAMENTALS**

Public educational policies are shaped by social demands and international influences and have been instrumental in promoting open education throughout

through Open Educational Resources (OER). These resources—such as courses, objects of open learning, tools, and licenses — offer free and adaptable access to knowledge, being recognized by international documents such as the Declaration Paris (2002) and the Cape Town Declaration (2007).

This emerging education movement combines the tradition of sharing of good ideas with fellow educators and the culture of the Internet, marked through collaboration and interactivity. This educational methodology is built on the belief that everyone should have the freedom to use, personalize, improve and redistribute educational resources, without restrictions. Educators, students, and others who share this belief are joining together in a worldwide effort to make education more accessible and more effective. (STATEMENT OF THE CITY OF CABO, 2007)

UNESCO highlights the importance of OER for inclusion, equity and quality educational, recommending adequate technological infrastructure, teacher training and institutional policies to encourage the creation and use of these materials. Initiatives such as OER Africa and OpenCourseWare Consortium ensure quality standards and accessibility.

OERs especially benefit developing countries by democratizing the access to education, enabling customization, translation and adaptation of content. However, adoption still faces challenges, such as resistance from educators, lack of training, limited infrastructure and lack of knowledge about open licenses.

The expansion of the movement is strengthened by Information Technologies and Communication (ICTs), the growth of institutional repositories and the impact of COVID-19 pandemic, which drove the digitalization of education. The inclusion of OER as part of the teaching workload and the creation of institutional policies to value can encourage greater use and production of these materials.

Finally, OER promotes a cultural shift in education, encouraging autonomy, critical thinking and active production of knowledge by students. The combination of OER and Open Access contributes to the construction of a system more collaborative, accessible, flexible and sustainable educational system, essential for the future of education in the 21st century.

## 2.2. COPYRIGHT AND OPEN EDUCATIONAL RESOURCES (OER)

The advancement of technologies and the internet has enabled greater access to information and inclusion of people with special needs, but there are still barriers, such as restrictions of copyright law. The Copyright Law (Law 9.610/98) protects intellectual works and guarantees recognition to authors, being essential in context of Open Educational Resources (OER), which are teaching materials of open access.

In Brazil, in 2010, the Ministry of Culture (MinC), after promoting discussions with various actors and in various cities, presented a draft bill to reform the LDA, submitting it to a public consultation, a process called the Copyright Forum.  
(VALENTE, PAVARIN, LUCIANO, 2019)

Public licenses, such as Creative Commons, allow the use, modification and sharing of content according to pre-established conditions, balancing authors' rights with access to knowledge. OER, by adopting open licenses, promote the democratization of education, the adaptation of content to local realities and the optimization of public resources. The "5Rs" (retain, reuse, review, remix and redistribute) define the main permitted uses of these resources.

Despite the advantages, OERs face challenges such as compliance with legislation, quality assurance and respect for privacy. Expanding the use of OER requires awareness, investment and collaboration between governments, institutions and organizations. Thus, OERs represent a strategy to make knowledge accessible, sustainable and inclusive, contributing to educational and social transformation.

## 2.3. THE SUSTAINABLE DEVELOPMENT GOALS (SDGs) IN PROMOTION OF OPEN EDUCATIONAL RESOURCES (OER)

Before the Sustainable Development Goals (SDGs), the world focused on Millennium Development Goals (MDGs), which prioritized the reduction of poverty, children's and women's health, but had less emphasis on sustainability environmental. Since ECO-92 and the 2030 Agenda, sustainable development has become central to national and international policies, involving multilateral cooperation between government, UN, private sector, academia and civil society.

The 2030 Agenda establishes five main pillars — People, Planet, Prosperity, Peace and Partnerships — and guides integrated action to face challenges global goals such as poverty eradication, economic growth, social inclusion, environmental sustainability and good governance by 2030. Education, especially Education for Sustainable Development (ESD) is seen as essential to form conscious citizens and promote social, economic and environmental transformations.

The SDGs recognize the fundamental role of universities and repositories institutional in promoting quality education (SDG 4) and innovation (SDG 9), facilitating access to scientific knowledge and research. Open education and Open Educational Resources (OER) emerge as important tools for democratize access to education, reducing costs, promoting inclusion, collaboration, innovation and educational sustainability.

The main advantage is the optimization of public resources. The second is access to content, which becomes easier once it's available online, and purchasing textbooks is no longer the primary means of accessing knowledge.

And the third major advantage is the possibility of adapting the content to regional realities, which leads to an improvement in the quality of teaching. (SANTANA, ROSSINI, PRETTO; 2012)

OERs allow for content customization and encourage ongoing training of teachers and contribute to reducing educational inequalities, fostering a culture of ethical sharing and respect for copyright. Thus, these resources are fundamental to making education more accessible, inclusive, innovative and sustainable, aligning with the objectives of the 2030 Agenda for a fairer and more sustainable future balanced.

Open Educational Resources (OER) have been transforming education by expand access to learning, promote inclusion and overcome economic and geographical. Despite the advancement of information technologies, there is still a shortage of freely accessible quality educational resources. The sustainability of OER goes beyond being free, requiring investments to ensure its long-term viability for producers and users.

International initiatives, such as those from MIT, Open Education Consortium and OER Universities, promote access and certification in open education. OERs, available digitally, can be adapted to different needs, promoting



diversity, equity, and inclusion. They help reduce educational inequalities by offer free materials that overcome financial and geographical barriers.

OER also fosters global collaboration between educators and institutions, stimulate pedagogical innovation and contribute to lifelong education, enabling continuous and flexible learning. This movement strengthens a culture of ethical and sustainable knowledge sharing, creating a global network of collaborative learning that enriches educational quality and expands its reach.

Finally, the transformations brought about by OER require reflection on the objectives of education, encouraging methods that promote active student participation and integration of knowledge, preparing them for the demands of a world in constant change.

### **2.3.1. Sustainable Education at the Federal University of Uberlândia**

Public universities, such as the Federal University of Uberlândia (UFU), are fundamental for the generation of knowledge and the integral formation of citizens conscious and socially engaged. UFU acts in line with the UN 2030 Agenda, especially in the Sustainable Development Goals (SDGs), promoting inclusive, equitable and quality education (SDG 4), gender equality (SDG 5), sustainable energy (SDG 7), action against climate change (SDG 13), reduction of inequalities (SDG 10), innovation and infrastructure (SDG 9), and partnerships for implementation of the SDGs (SDG 17).

The university develops affirmative action policies, assistance programs student (scholarships, housing assistance, transportation, food, accessibility, inclusion) digital) and actions to guarantee access and retention for vulnerable students socioeconomic. Through the TecnoUFU Technology Park, it encourages innovation, entrepreneurship and sustainable development.

Education must find ways to respond to these challenges, taking into account multiple worldviews and other knowledge systems, as well as new frontiers in science and technology, such as advances in neuroscience and digital technology.

Rethinking the purpose of education and the organization of learning has never been more urgent. (UNESCO, 2016)

UFU integrates the SDGs into its teaching, research and extension activities, promoting critical, socio-emotional and ethical training, in addition to encouraging projects that

connect the university to the community. Its undergraduate, graduate, and extension contribute to regional and global sustainable development, strengthening skills to face social, economic and environmental challenges.

The institution also invests in teacher training to improve methodologies innovative, use of educational technologies and inclusive pedagogical practices, ensuring quality and continuous updating of higher education. Thus, UFU reaffirms its commitment to transformative education and sustainable development, fulfilling its social role in training professionals and leaders committed to a fairer and more sustainable future.

#### **2.4. USE OF OPEN EDUCATIONAL RESOURCES (OER) IN INSTITUTIONAL REPOSITORIES**

Digital libraries are organized collections of digital materials (texts, videos, audios) associated with tools that allow access, recovery, organization and preservation of content. Its purpose is to facilitate intellectual use and ensure accessibility and durability, with a focus on education and research.

In the context of open access, institutional digital repositories are a type of a digital library focused on the management and dissemination of university production, museums, public agencies, among others. They store academic content such as articles, theses, reports and teaching materials, promoting open scientific communication. These repositories follow open standards that guarantee interoperability, allowing searches advanced by metadata. Institutional policies regulate the roles of producers (authors), managers and end users.

DSpace software is widely used for its flexibility, open source and support for self-archiving, facilitating visibility and impact of production scientific. The sustainability of these repositories depends on institutional policies, such as mandatory deposit, which strengthen the preservation of academic memory and expand access to science.

Repositories are also essential in promoting Educational Resources Open (OER) — teaching materials with licenses that allow use and sharing. However, its effectiveness depends on organization, visibility and alignment with educational objectives. OER in institutional repositories

encourage innovative pedagogical practices, interdisciplinarity and inclusive education, contributing to SDG 4 (Quality Education) of the 2030 Agenda.

The term "digital repositories," in the context of the global open access movement, is used to describe the various types of data providers that constitute alternative avenues for scholarly communication. Each type of digital repository has specific functions within the scholarly communication system and specific applications tailored to the environment in which it will be used. (SAYÃO et al, 2009)

Despite increasing institutional visibility and reducing material costs didactics, there is still a lack of clear policies on submission, copyright and licensing. The teacher training and encouraging the legal use of OER are fundamental. The sustainability of OER requires reliable, accessible and openly licensed platforms. In Brazil, digital inequalities challenge its full adoption, requiring efforts to expand connectivity and access to devices.

There are different models of OER repositories: specific (national or thematic), hybrid (educational and scientific) and aggregating directories. These spaces derive from the old LORs (Learning Object Repositories) and aim to preserve and disseminate Long-term REA.

#### **2.4.1. *Ducere* - UFU Institutional Repository: Historical Context**

Institutional memory results from scientific production and the knowledge generated by the university, which has historically been restricted to printed and local access, limiting their visibility and social contribution. Institutional repositories (IRs), for its storage and organization capacity, changed this reality, allowing the systematization, preservation and dissemination of scientific, technical, cultural and technologically online, expanding access and credibility of information.

The RI of the Federal University of Uberlândia (UFU) aims to store and preserve this institutional memory, aligning with open access policies and the Objectives of Sustainable Development (SDGs). Since 2009, UFU's IR has been using the software DSpace, implemented with support from the Brazilian Institute of Information in Science and Technology (IBICT), having gone through periods of stagnation that were overcome with the modernization and adoption of self-archiving — a practice that allows people to researchers to deposit their work, with quality control carried out by library.

The implementation of the mandatory deposit policy (mandate) was fundamental for the significant increase in the number of documents deposited and registration of users, ensuring greater visibility and preservation of academic production, associated to persistent identifiers such as DOI and ORCID.

In 2023, RI-UFU incorporated a field for linking work to SDGs, facilitating the measurement of the university's contribution to the 2030 Agenda and the sustainable development, with an interdisciplinary and transdisciplinary focus.

The Institutional Repository of the Federal University of Uberlândia (RI/UFU) aims to store, preserve and disseminate the institutional memory, contribute to open access to information and legislation, in order to provide greater visibility to production scientific, technical, cultural, artistic, administrative and technological UFU. (COUTO et al, 2023)

Currently, RI-UFU makes several types of documents available for access open, such as articles, theses, dissertations, reports and proceedings, promoting democratization of knowledge and open education. However, challenges remain, especially regarding the inclusion and dissemination of Open Educational Resources (OER), such as teaching materials, recorded classes, videos and exercises produced by teachers. The active participation of the academic community is crucial to expanding the creation, updating and sharing these resources, strengthening innovative educational practices and collaborative initiatives that benefit teaching and learning at UFU and other institutions.

## 2.5. METHODOLOGY

The research adopted a quantitative approach to analyze the use of Resources Open Educational Resources (OER) in institutional repositories, focusing on the perception of professors and students of the Faculty of Computing at the Federal University of Uberlândia (UFU). This is a descriptive study that seeks to understand the contribution of these resources for Sustainable Development Goal 4 (SDG 4) – Education Quality.

Data collection was carried out through a structured online questionnaire in five sections: respondent profile, knowledge about OER and SDG 4, use of

institutional repository, impact of OER on education and challenges and recommendations. The sample included 18 teachers and 35 students from FACOM.

The data were analyzed quantitatively with descriptive statistics (frequencies, averages, percentages) using Microsoft Excel, and qualitatively by content analysis to identify themes and categories on perception, barriers and suggestions related to OER.

The investigation is geographically limited to the municipality of Uberlândia and temporally to 2024 data and recent initiatives between 2020 and 2024. The study is focused on the context of FACOM/UFU, examining the intersection between open education, technology and sustainability.

The questionnaire was applied online, with invitations via institutional emails, social networks social and internal groups, with guaranteed anonymity, confidentiality and consent informed of the participants, ensuring ethics in the research.

## 2.6. RESULTS ANALYSIS

The study investigated the perception and use of Open Educational Resources (REA), in addition to familiarity with the Institutional Repository of the Federal University of Uberlândia (UFU), in the context of the Sustainable Development Goals of UN, especially SDG 4 – Quality Education. 53 people participated in the survey people: 18 teachers (34%) and 35 students (66%), with emphasis on the courses of Information Systems – Santa Monica Campus (50.9%), Computer Science – Santa Monica Campus (32.1%) and Information Systems – Monte Carmelo Campus (17%).

Regarding the use of the institutional repository, 24.5% of participants never did so. used it, 47.2% access it sporadically and 28.3% use it regularly. Regarding the knowledge of OER, 58.5% said they had already heard of the term, while 41.5% do not know it, highlighting the need for greater dissemination and training.

Regarding the most recognized types of OER, 48 participants identified the video lessons as the main format. On the other hand, games in open repositories had minimal adherence, being cited by only one participant. Email (48%) and Moodle (34.8%) were the most used channels to access OER, while platforms Open resources such as Wiki and archive.org were cited by only 1.4% of respondents, revealing underutilization of open access tools.

Although 47.2% of participants had already accessed OER through the Repository Institutional of UFU, 52.8% have never done so, indicating that the platform is not yet widely consolidated among users. Digital Educational Texts (79.2%), Content Multimedia (75.5%) and Video lessons (69.8%) were the preferred types of OER, reflecting modern trends in teaching. Resources such as Teacher Training Materials (15.1%) had low adherence, which may be related to the predominantly student in the sample.

The majority of participants (56.6%) consider OER “very important” for teaching and learning, while only 1.9% consider them unimportant. The main uses of the OER identified were: carrying out academic work (37.1%), study of specific topics (33.7%) and lesson planning (12.4%).

Among the main challenges, the difficulty in finding materials stands out adequate (40%) and lack of knowledge about the OER available in the repository (38.3%). Lack of clear information (15%) and technical limitations (3.3%) were also mentioned. Furthermore, 38.3% of participants reported never having used OER available at RI-UFU.

Three main factors were identified as essential to encourage the use of OER: greater dissemination and training (62.3%), better organization and accessibility of repositories (13.2%) and expansion of the variety of resources (24.5%). These aspects reinforce the importance of institutional policies to encourage the use of OER and continuous improvement of access platforms.

The study concludes that OER represent a strategic tool for democratize knowledge, expand the quality of education and support practices innovative pedagogical approaches. However, their full use still depends on actions coordinates aimed at training, improving digital infrastructure and promoting an institutional culture focused on open access.

## CONCLUSION

Analysis of data collected through an online form on the use of Open Educational Resources (OER) at the UFU Faculty of Computing reveals positive perceptions about its importance, but also points to significant challenges in the implementation and use of these materials, especially in the Institutional Repository of university (RI-UFU).

Although most participants recognize the value of OER for a inclusive and quality education, according to UN SDG 4, many still do not use the RI-UFU frequently — 53% have never accessed the repository, and 47% use it occasionally. This demonstrates the need to increase visibility, accessibility and usability of the platform.

The study indicates that lack of familiarity with the repository, difficulties in navigation and lack of adequate training limit the effective use of OER. The participants point out more effective dissemination and programs as priority solutions training on the use and contribution of resources.

Didactic texts, videos and multimedia materials are among the most sought after, reflecting current pedagogical demands. On the other hand, materials aimed to teacher training and pedagogical practices are still little accessed, signaling the importance of strategies to promote greater diversity of content.

Finally, the study reinforces that OERs are fundamental to the advancement of digital and inclusive education. It is necessary to strengthen institutional policies that encourage the use of OERs. RI-UFU, expanding access and production of open educational materials for both internal academic community and the external public.

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