United Nations Educational, Scientific and Cultural Organization

UNESCO Institute for Information Technologies in Education

United Nations Educational, Scientific and Cultural Organization

International Research and Training Centre for Rural Education

Guidance on Open Educational Practices during School Closures

Utilizing OER under COVID-19 Pandemic in line with UNESCO OER Recommendation

May,2020,Version 1.0

北京师范大学智慧学习研究院 Smart Learning Institute of Beijing Normal University

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Utilizing OER under COVID-19 Pandemic in line with UNESCO OER Recommendation

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Guidance on Open Educational Practices during School Closures:

Utilizing OER under COVID-19 Pandemic in line with UNESCO OER Recommendation

May 18th, 2020

Institute for Information Technologies in Education, UNESCO
International Research and Training Center for Rural Education, UNESCO
Smart Learning Institute, Beijing Normal University, China

May, 2020. Version 1.0

Preface

The COVID-19 pandemic has resulted in unprecedented challenges to our safety, health and education. According to statistics published by UNESCO of 17 May, 1.21 billion students and children could not still go back to school, accounting for 69.3% of the world's student population. The global education community continues to face the major challenge of providing interactive and motivating educational experience during school and university closure. In this special situation, Open Educational Resources (OER) has never been so urgently and broadly needed like today. As emphasized in their Joint Statement by Mrs. Stefania Giannini, UNESCO Assistant Director-General for Education, and Mr. Moez Chakchouk, UNESCO Assistant Director-General for Communication and Information:

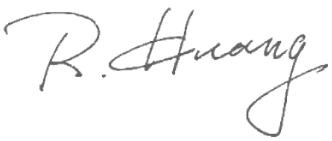
> "Today we are at a pivotal moment in history. The Covid-19 crisis has resulted in a paradigm shift on how learners of all ages, worldwide, can access learning. It is therefore more than ever essential that the global community comes together now to foster universal access to information and knowledge through OER."

At this critical moment, UNESCO Institute for Information Technologies in Education (UNESCO IITE) and UNESCO International Research and Training Centre for Rural Education (UNESCO INRULED) release a new publication "Guidance on Open Educational Practices during School Closures: Utilizing OER under COVID-19 Pandemic in line with UNESCO OER Recommendation" together with their partners. This publication is motivated and inspired by UNESCO OER Recommendations and the innovative experiences worldwide. It aims to show the implications of using Open Educational Practices (OEP) and Open Educational Resources (OER) on learning outcomes. Particularly, it describes, through illustrative examples, innovative approaches to using OEP and OER worldwide during COVID-19 outbreak. These experiences are in line with UNESCO OER recommendations for five areas, namely: (i) Building capacity of stakeholders to create access, use, adapt and redistribute OER; (ii) Developing supportive policy; (iii) Encouraging inclusive and equitable quality OER; (iv) Nurturing the creation of sustainability models for OER; and (v) Facilitating international cooperation.

On behalf of UNESCO IITE and UNESCO INRULED, we would like to thank our partners from the globe. Our special thanks go to the National Commission of the People's Republic of China for UNESCO for their incredible support during the realization of this publication. We also acknowledge with gratitude contributions to this publication from our partner organizations, including Smart Learning Institute of Beijing Normal University (SLIBNU), the International Association of Smart Learning Environment (IASLE), the Arab League's Educational, Cultural and Scientific Organization (ALECSO), Research Institute for Innovation & Technology in Education (UNIR iTED, Spain), West University of Timisoara (Romania) and Edmodo. Last but not the least, we are very thankful to our colleagues from UNESCO Education Sector and Communication and Information Sector for their constant support.

Dr. Tao Zhan

Director, UNESCO Institute for Information Technologies in Education



Dr. Ronghuai Huang

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Acknowledgement

Many people have helped us in finalizing this guidance. They have our great appreciation for the long hours and hard work they devoted to conducting research and developing the content. Without their incredible assistance, this book would not have been realized.

We would like to acknowledge the help of several researchers who worked on developing the contents and organizing the webinar for this handbook. We would also like to acknowledge the contribution of several experts for their professional feedback to enhance this handbook, especially Mr. Cedric Wachholz and Ms. Zeynep Varoglu from UNESCO Communication and Information Sector. Finally, we would also like to express our great appreciation to Mr. Fengchun Miao from UNESCO Education Sector for his long-term and continued support.

Thanks also go to those experts from the Smart Learning Institute of Beijing Normal University (SLIBNU), UNESCO International Research and Training Center for Rural Education(UNESCO INRULED), UNESCO Institute for Information Technologies in Education(UNESCO IITE), International Society for Technology in Education (ISTE), International Association of Smart Learning Environments (IASLE), Arab League's Educational, Cultural and Scientific Organization (ALECSO) and Edmodo for their professional feedback and comments during the preparation of this guidance.

Contents

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Executive Summary

With the Coronavirus (COVID-19) rapidly spreading worldwide, several countries have initiated several strategies to stop the spread of this virus, including school closures. UNESCO stated that, as of 17 May, almost 1.21 billion learners were affected, accounting for 69.3% of the world's student population. Particularly, China was the first to adopt the policy of "Disrupted Classes, Undisrupted Learning" by providing online, distance and remote teaching. However, several educational challenges appeared during this unexpected critical situation of COVID-19 outbreak. For instance, in this first-ever application of pure long-term online learning (without face-to-face learning or blended learning), both teachers and learners should not feel that they are left alone during the teaching and learning processes. Additionally, new effective pedagogical approaches are needed to keep learners motivated and engaged during this long period of online learning. To overcome the above challenges, new teaching approaches are needed. In this context, several researchers suggested the use of Open Educational Practices (OEP) and Resources (OER) to provide engaging and interactive experience. UNESCO (2019) also stated that:

> "the judicious application of OER, in combination with appropriate pedagogical methodologies, well-designed learning objects, and the diversity of learning activities, can provide a broader range of innovative pedagogical options to engage both educators and learners to become more active participants in educational processes and creators of content as members of diverse and inclusive Knowledge Societies".

Additionally, UNESCO (2019) provided five objectives that should be focused on facilitation of OER adoption, namely: (i) Building capacity of stakeholders to create access, re-use, adapt and redistribute OER; (ii) Developing supportive policy; (iii) Encouraging inclusive and equitable quality OER; (iv) Nurturing the creation of sustainability models for OER; and (v), Facilitating international cooperation. Therefore, this handbook discusses the use of OEP and OER during COVID-19 outbreak through global vivid stories and experiences, and in line with the five UNESCO objectives. It also discusses OER competencies for OEP. Finally, this handbook provides guidelines to both teachers and learners to facilitate OEP and OER application.

Glossary of terms

Information and communication technology (ICT): ICT is a technology field formed by the fusion of information technology and communication technology, which is not only the backbone of the information society, but also an important catalyst and tool for inducing educational reforms that change our students into productive knowledge workers (Pelgrum, 2001).

Distance Education: Distance education is a planned learning that normally occurs in a different place and requires a well-defined system of delivery that includes modified teaching techniques, alternative modes for communication including, but not limited to technology, as well as alternative administrative and organizational components (Moore & Kearsley, 1996).

Online Education: Open Education is a way of carrying out education, often using digital technologies. Its aim is to widen access and participation to everyone by removing barriers and making learning accessible, abundant, and customisable for all. It offers multiple ways of teaching and learning, building and sharing knowledge. It also provides a variety of access routes to formal and non-formal education, and connects the two (Inamorato dos Santos, Punie & Castaño-Muñoz, 2016).

Inclusive Education: Inclusive education aims to ensure that learners with diverse needs and preferences (e.g., learners with disabilities) can have equal opportunities in accessing learning resources, services and experiences in general (Florian & Linklater, 2010).

Creative Commons: Creative Commons (CC) is the most developed alternative licensing approach founded by Larry Lessig of Stanford University in 2001. The CC approach provides user-friendly open licenses for digital materials and avoids the automatically applied copyright restrictions (UNESCO, 2015).

Learning Object: Learning object has been defined as a modular building block for e-learning contents, as an instructional element grounded in the object-orientated paradigm, and as a digital self-contained and reusable entity (Friesen, 2009).

Massive Open Online Courses (MOOCs): The term Massive Open Online Courses (MOOCs) was first introduced in 2008 by Dave Cormier to describe Siemens and Downes' "Connectivism and Connective Knowledge" course at the University of Manitoba, Canada (Cormier, 2008; Siemens & Downes, 2018). Different ideologies have driven MOOCs in two distinct pedagogical directions: the connectivist MOOCs (cMOOC) which are based on a connectivism theory of learning with networks developed informally; and content-based MOOCs (xMOOCs), which follow a more behaviourist approach (Yuan & Powell, 2013). Overall, many MOOCs share a common goal of bringing large numbers of learners together in a common environment

for a course delivered as a set of online lessons (Porter, 2014).

Open Access Publishing: Open access publishing usually refers to the worldwide electronic distribution of peer-reviewed journal literature in order to give free and unrestricted access to it (UNESCO, 2015).

Open Educational Practices (OEP): Wiley and Hilton (2018) considered OEP as an OER-enabled pedagogy and defined it as a 'set of teaching and learning practices that are only possible or practical in the context of the 5R permissions that are characteristic of OER'.

Open Educational Resources (OER): OER is 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 permit no-cost access, [reuse], [repurpose], adaptation, retention and redistribution by others (Stracke et al., 2019; UNESCO, 2019).

Open Licence: Open license refers to a license that respects the intellectual property rights of the copyright owner and provides permissions granting the public the rights to access, re-use, re-purpose, adapt and redistribute educational materials (UNESCO recommendation, 2019).

Open Learning: Open learning is an approach to education that seeks to remove all unnecessary barriers to learning, while aiming to provide students with a reasonable chance of success in an education and training system centered on their specific needs and located in multiple arenas of learning (UNESCO, 2015).

OER Authoring Tools: Authoring tools that enables users to create OERs, including open contents (e.g. images, videos, texts, animations and audios) and open online courses. Wikis are already extensively used in many higher education programmes for educational purposes, and are one of the authoring tools being used to generate 'open' content (UNESCO, 2015).

OER Repository: A place on the internet as well as in the physical world for storing digital OER for later search and retrieval, such as MIT OCW (http://ocw.mit.edu) and OpenLearn (http://openlearn.open.ac.uk.) (UNESCO, 2015).OER Directory Sites: OER directory sites do not act as a repository, but have identified quality OER and store them in a database of web links, such as OER Commons (www.oercommons.org) and Commonwealth of Learning (www.col.org/OER) (UNESCO, 2015).

OER Community: A place where members of the community can work together on questions, issues and documents of OER, such as UNESCO OER Community (http://oerwiki.iiepunesco.org). The site contains useful resources needed to understand what OER is about, and how to use/contribute/collaborate (UNESCO, 2015).

Open Textbooks: An Open Textbook is a textbook licensed under an open license and made available online to be freely used by students, teachers and members of the public. Many open textbooks are distributed in either print, e-book, or audio formats that may be downloaded or purchased at little or no cost (Algers, 2019).

Open Pedagogy: Open pedagogy is a set of teaching and learning practices that is only possible in the context of the free access and 5R (reuse, redistribute, revise, remix and retain) permissions characteristic of open educational resources (Wiley, 2013).

Open Collaboration: The prototypical open collaboration system is an online environment that (a) supports the collective production of an artifact (b) through a technologically mediated collaboration platform (c) that presents a low barrier to entry and exit and (d) supports the emergence of persistent but malleable social structures. Combined, these characteristics yield complex sociotechnical systems that offer new opportunities for people to form ties with others and create things together (Andrea, Forte, Cliff, & Lampe, 2013).

Open Assessment of Learning: The process of learning verification and feedback that takes place collaboratively, mediated by free access tools in which teachers produce or adapt assessment resources and students adapt and reshape these resources for the purpose of generating for themselves an assessment that meets their personal needs, learning styles and context (Chiappe, 2012).

OER 5R: The 5R permissions of OER includes reuse, revise, remix, redistribute and retain. Reuse refers to the right to use the content in a wide range of ways (e.g. in a class, in a study group, on a website, in a video). Revise refers to the right to adapt, adjust, modify or alter the content itself (e.g. translate the content into another language). Redistribute refers to the right to share copies of the original content, your revisions or your remixes with others (e.g. give a copy of your content to a friend). Retain refers to the right to make, own and control copies of the content (e.g. download, copy, store and manage). Remix refers to the right to combine the original or revised content with other material to create something new (e.g. incorporate the content into a mashup) (UNESCO, 2015).

1.Background of using open educational practices during the COVID-19 outbreak

1.1.Importance of open educational practices during COVID-19

To contain the coronavirus spread, the Chinese government requested all people, including students, to remain home for quarantine until further notice, as a result millions of students were unable to attend schools and universities. UNESCO (2020) stated that, as of 17 May, almost 1.21 billion learners were affected, accounting for 69.3% of the world's student population. The Chinese Ministry of Education (MoE) and several education specialists and universities have started discussing the use of information and communication technology (ICT) to reform the entire educational system in the midst of this coronavirus outbreak and provide online and distance learning instead, even with disrupted classes. Online and distance education in China started in the 1960s, when Chinese radio and TVs started offering distance education to remote areas, whereas several Chinese universities have adopted online education since 1998 (Ting, Smith, & Gomez, 2018). While online and distance education is not new in China, several challenges have arisen in China and worldwide regarding this type of system in this unexpected and critical situation:

- Lack of preparation time: Teachers have not prepared their learning content to adapt to online learning, and preparing such content takes time. Similarly, several universities and schools have not improved their online learning environments to support this kind of learning experience.

- Teacher/learner isolation: In this first-ever application of pure long-term online learning (without face-to-face learning or blended learning), both teachers and learners should not feel that they are left alone during the teaching and learning processes.

- Need for effective pedagogical approaches: New effective pedagogical approaches are needed to keep learners motivated and engaged during this long period of online learning,

especially that drop-out rates of distance learning is generally higher than in-campus based learning.

To help overcome the problem of limited time to prepare online learning content, teachers should make use of the thousands of open educational resources (OER) published by the MoE and available in other national and international repositories as well as public online tools, platforms, and enabling technologies. The term open educational resources was first coined at UNESCO's 2002 Forum on Open Courseware, and it was defined in the recent UNESCO (2019) recommendation on OER as:

'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 licence that permit no-cost access, [reuse], [repurpose], adaptation, and redistribution by others'.

OERs have the potential to achieve inclusive education aiming to ensure that learners with diverse needs and preferences (such as learners with disabilities) have equal opportunities in accessing learning resources, services and experiences in general (Zhang, Tlili, et al., 2020). Blackall and Hegarty (2011) also mentioned that using OER can save time in preparing learning materials. To solve the problems related to teacher/learners isolation, as well as the need for effective pedagogical approaches to keep learners active and engaged, teachers should build their courses around OER and ask their learners to find content to solve problems, write reports, or do research. Specifically, open educational practices (OEP) – including open pedagogy, open collaboration, and open assessment – should be implemented to keep the learners motivated and engaged during this long period of online learning. Ehlers (2011) defined OEP as 'practices which support the (re)use and production of OER through institutional policies, promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning paths'. With the rapid evolution of the open education concept, researchers have shifted their focus from content-centred approaches,

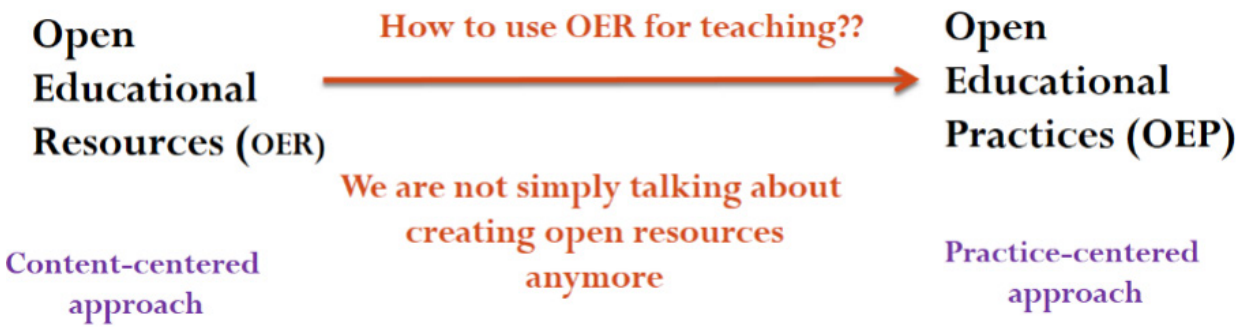


Figure 1. OER vs OEP

which focus on educational resources (creation, sharing, etc.), to more practice-centred ones that foster collaboration between learners and teachers for creating and sharing knowledge (Cronin, 2017). In other words, as shown in Figure 1, researchers and educators have shifted their focus from creating and publishing OER to practices that can be implemented using OER for education, referred to as OEP. The recently approved UNESCO (2019) OER recommendation also stated that:

'the judicious application of OER, in combination with appropriate pedagogical methodologies, well-designed learning objects, and the diversity of learning activities, can provide a broader range of innovative pedagogical options to engage both educators and learners to become more active participants in educational processes and creators of content as members of diverse and inclusive Knowledge Societies'.

Chiappe and Adame (2018) stated that OEP have become a growing educational trend based on ICT. In line with these developments, this handbook focuses on OEP that could be used based on OER to provide active and engaging learning experiences for learners during this coronavirus outbreak. UNESCO (2020) has recently launched a call stating that "the Covid-19 crisis has resulted in a paradigm shift on how learners of all ages, worldwide, can access learning. It is therefore more than ever essential that the global community comes together now to foster universal access to information and knowledge through OER."

UNESCO OER Objective. (ii) Developing supportive policy

(b) Ecouraging and supporting institutions to develop or update legal or policy frameworks to stimulate the creation, access, re-use, re-purpose, adaptation and redistribution of quality OER by educators and learners in a manner consistent with national copyright legislation and international obligations; and to develop and integrate a quality assurance mechanism for OER into the existing quality assurance strategies for teaching and learning materials.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (ii) Developing supportive policy

(c) Developing mechanisms to create communities of practice, promote teacher professional development using OER, create networks of experts of OER and properly recognize OER creation as a professional or academic merit.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (iv) Nurturing the creation of sustainability models for OER

(c) Promoting and raising awareness of other value-added models using OER across institutions and countries where the focus is on participation, co-creation, generating value collectively, community partnerships, spurring innovation, and bringing people together for a common cause.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (v) Promoting and reinforcing international cooperation

(c) Supporting the creation and maintenance of effective peer networks that share OER, based on areas such as subject matter, language, institutions, regions and level of education at local, regional and global levels.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

1.2.Implications for teaching and learning

OEP have the ability to improve the opportunity of accessing good educational content for learners, hence help in achieving accessible learning and lifelong learning (Nascimbeni & Burgos, 2019). Additionally, OEP allow learners to be engaged and active during the learning process. Furthermore, OEP go a step beyond active learning (Huang et al., 2020) by engaging learners in creating and revising OER, hence contributing to the learning of the learners who come after them. This can further help learners gain digital literacy skills (searching, assessing, and identifying online resources), which are fundamental for 21st-century literacy. Moreover, OEP offer potential for new approaches to pedagogy that, by one observation, can create "a site of praxis, a place where theories about learning, teaching, technology, and social justice enter into a conversation with each other and inform the development of educational practices and structures" (DeRosa & Jhangiani, 2018). Some innovative pedagogy have been explored in China to ensure the quality of higher education course during COVID-19 outbreak (Huang et al, 2020).

As both OEP and OER can facilitate the learning and teaching processes during the educational disruption due to the COVID-19 outbreak, several international organizations, including the United Nations Educational, Scientific and Cultural Organization (UNESCO), Arab League Educational, Cultural and Scientific Organization (ALECSO) and Commonwealth of Learning (COL) have shared quality OER and tools on their webpages for teachers and learners to use during the educational process at home. Additionally, ALECSO, for instance, is now providing OER trainings to help teachers in the Arab region create and share their OER with others to maintain undisrupted learning.

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(a) Building awareness among relevant stakeholder communities on how OER can increase access to educational and research resources, improve learning outcomes, maximize the impact of public funding, and empower educators and learners to become co-creators of knowledge.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (iv) Nurturing the creation of sustainability models for OER

(c) Promoting and raising awareness of other value-added models using OER across institutions and countries where the focus is on participation, co-creation, generating value collectively, community partnerships, spurring innovation, and bringing people together for a common cause.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

Note 1. OEP vs OER

OER is a content-centered approach where the focus is on creating and (re)using resources. OEP constitute the range of practices around the creation, use, and management of open educational resources with the intent to improve quality and innovate education. In other word, OEP is a practice-centered approach where the focus is on the practices of interaction between teachers and learners using OER for education.

2.Applying open educational practices

2.1.Open educational practices framework

OEP must be fully understood since, as noted by Cronin (2017), their scope is rapidly evolving, and researchers tend to focus on different OEP perspectives. Therefore, this section aims to draw an OEP framework based on several reported OEP definitions in the literature. In this context, we have conducted a comprehensive review of OEP definitions (Huang, Tlili, et al., 2020). Based on these definitions, the five following conditions were identified that should be present during the applications of OEP in education, as shown in Figure 2.

- OER: Teaching materials used within OEP should be openly licenced, and the resources produced during the course (e.g. reports, presentations, videos) should also be released as OER.

- Open teaching: Educators should implement texaching methodologies that can help students to construct their own (self-regulated) learning pathways and to actively contribute to knowledge building, both individually and collaboratively.

- Open collaboration: Teachers should build open communities, for instance by using social networks, to help students to work in teams to carry out particular learning tasks (e.g. editing a blog, creating a Wikipedia page) as well as to exchange ideas and discussions related to those specific learning tasks. Other teachers and stakeholders can participate in these discussions as well to further assist learners.

- Open assessment: Teachers should allow learners to evaluate one another (peer assessment). This can emphasise reflective practices and improve learning outcomes.

- Enabling technology: Teachers should make use of different technologies and tools to build and support a connected learning community where the OEP can flourish. These technologies and tools include OER authoring tools, OER repositories, social networks, and collaborative editing tools.

Since OEP, as with all teaching activities, are complex and multipronged practices, the conditions above are interrelated. In OEP, students are encouraged to carrying on flexible learning (Huang et al., 2020). Specifically, four relations, discussed below, can be formed among the five aforementioned conditions. All these relations are mediated by technology that is conceived as an enabling condition for OEP to be developed, not as the central aspect of the practice. It should be noted that numbers are used as indices of relations and do not reflect the level of importance of these relations.

UNESCO OER Objective. (ii) Developing supportive policy

(c) Developing mechanisms to create communities of practice, promote teacher professional development using OER, create networks of experts of OER and properly recognize OER creation as a professional or academic merit.

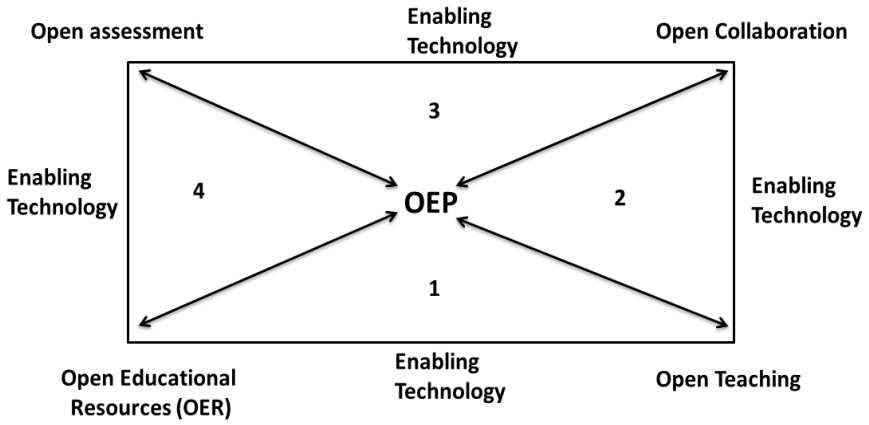
Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

1. Relation “OER–enabling technology–open teaching”: This is possibly the most typical example of OEP. Thanks to this relation, students can enjoy open and collaborative learning processes based on OER via participatory technology. For instance, teachers can use OER, such as open textbooks, as teaching content and ask their students to further improve such content by remixing it with other content or by creating new activities and exercises for the course.

2. Relation “open teaching–enabling technology–open collaboration”: Through this relation, teachers foster students’ engagement in open collaborations via technology, such as social media and networks, where they engage with existing online and offline communities and stakeholders.

3. Relation “open collaboration–enabling technology–open assessment”: This relation describes the case when students are assessed by relying on collaboration with existing external communities and stakeholders, also resulting in open assessment reports (e.g. dashboards) for everyone.

4. Relation “open assessment–enabling technology–OER”: This regards fostering collaborative and peer assessment of the resources developed individually or in groups by the learners; the obtained open assessment (feedback, reports, and dashboards) can then be used to enhance the OER.



1. OER-Enabling technology-Open teaching
2. Open teaching- Enabling technology-Open collaboration
3. Open collaboration- Enabling technology-Open assessment
4. Open assessment- Enabling technology-OER

Figure 2. OEP framework for open education (Huang, Tlili, Chang, Zhang, Nascimbeni, & Burgos, 2020).

UNESCO OER Objective. (iv) Nurturing the creation of sustainability models for OER

(d) Enacting regulatory frameworks that support the development of OER products and related services that align with national and international standards as well as the interest and values of the OER stakeholders.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

Note 2. Selection of OEP enabling technology can enhance learning experiences

Selection of friendly learning tools and technologies that learners are already familiar with can make the implemented OEP more flexible. It is also crucial that teachers avoid overloading learners by asking them to use too many tools, resulting in inconvenient learning practices for them.

The stories below illustrate how these issues were dealt with at the level of individual teachers/ universities and at municipal and national levels.

Story 1: Application of OEP to teach "Family Education" at the Smart Learning Institute of Beijing Normal University, China

To provide an engaging learning experience during the COVID-19 outbreak, the teacher applied OEP to teach 'family education' course. Specifically, to ensure open teaching, the teacher posted each chapter of the course, made of existing OER and released as OER as well. In each chapter, she discussed specific problems related to each age category and how experts advised to work with them. The students then had to work in teams, under the supervision of the teacher, to enhance the teaching materials by searching for new problems in each age category and the way parents should deal with them. Specifically, all groups worked on public "Tencent" documents (similar to Google Docs) where they can see each other's work and progress.

At the same time and to ensure open assessment and collaboration, a public learning community on the social network Toutiao, as shown in Figure 3, was built where students exchanged ideas and discussion together to ensure peer assessment and reflective practices about their proposed learning materials. Meanwhile, the teacher focused more on being a facilitator, by providing references or advices to/while prepare(ing) the learning materials. Additionally, she focused on encouraging students to communicate in order to increase self-confidence and trust in and between learners.

Finally, after each chapter, each team provided a public summary presentation using ZOOM about how to make parents-kids relationship stronger. In these presentations, parents and experts were invited to further discuss with the teams their work. In this context, all the prepared learning materials, including documents, presentations and video recording of the presentation (which involves the interaction of experts, parents and the teams) were collected and released as OER handbook with supplemental materials (videos and presentations) to be a reference for everyone. Additionally, project-based assessments were used instead of using paper and pencil assessment exams.

Figure 3. The use of ‘Toutiao’ during the family education course

Story 2: Application of OEP to teach “Romanian Language and Literature” at “Diaconu Coresi” School, Brașov,Romania

On 10th of March, the Romanian Ministry of Education and Research (MER) has announced that the courses in all the schools were suspended, encouraging and supporting online learning. During the coronavirus outbreak, teachers and students in schools are using a large repository of Open Educational Resources (OERs) and other materials (http://digital.educred.ro), developed by the ongoing national project CRED (Relevant Curriculum and Open Education for All), partners of which are MER and the Institute of Educational Sciences. Many teachers also create OERs for the repository and share their online teaching experiences in online communities, such as the Facebook groups of CRED (https://www.facebook.com/groups/574392349703069) and of the Coalition for OER (https://www.facebook.com/groups/REDRomania).

Many school teachers use G Suite for Education or Office 365 for the online classes, integrating OERs. Some sessions are recorded, uploaded and shared as OERs for (re) use. Learners participate in individual and group activities, creating projects and presentations, for which they send photos and multimedia content on the class online platforms. For instance, as shown in Figure 4, a librarian was invited by the class teacher at the "Romanian Language and Literature" course on Zoom, accompanied by WhatsApp, used to exchange ideas and to encourage discussion with pupils in the 7th grade of the "Diaconu Coresi" School in Brașov .

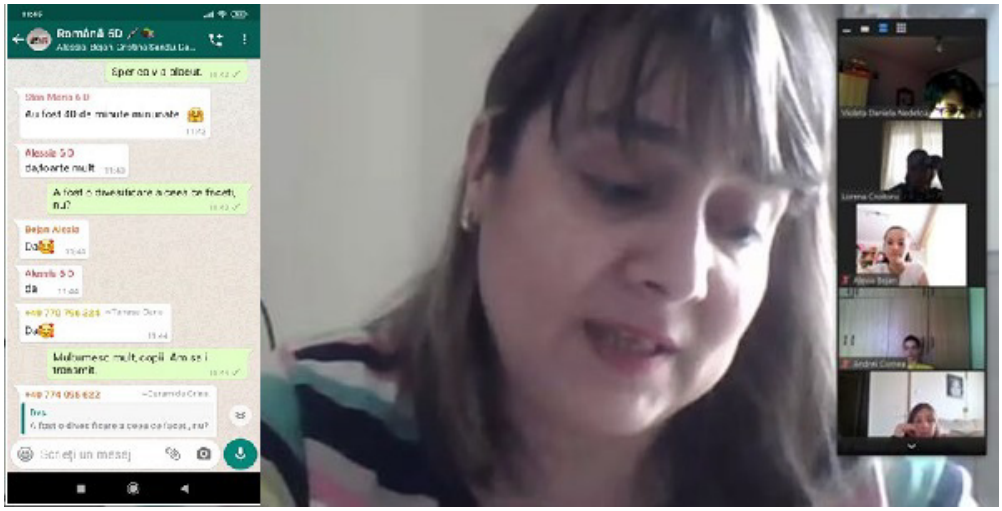


Figure 4. A guest librarian and the pupils during a Zoom course session - experience shared in CRED FB Group (https://www.facebook.com/groups/574392349703069)

Story 3: Application of OEP to teach "Distance Education" at Hangzhou Normal University (HZNU), China

The teacher created his course, as OER, using previous OERs created by his students (in the previous academic years). He then recorded open videos to instruct the students on how to login to the learning management platform, and how to sign in the course, as well as the criteria for the final course assessment. The students had to write their own reports, as OER that summarize each course chapter. All these reports were then collected at the end of the course to create an open textbook that everyone can refer to and (re) use. The teacher also built a community for open collaboration by using QQ and DingTalk, where the students exchange ideas based on specific course topics posted by the teacher, as shown in Figure 5.

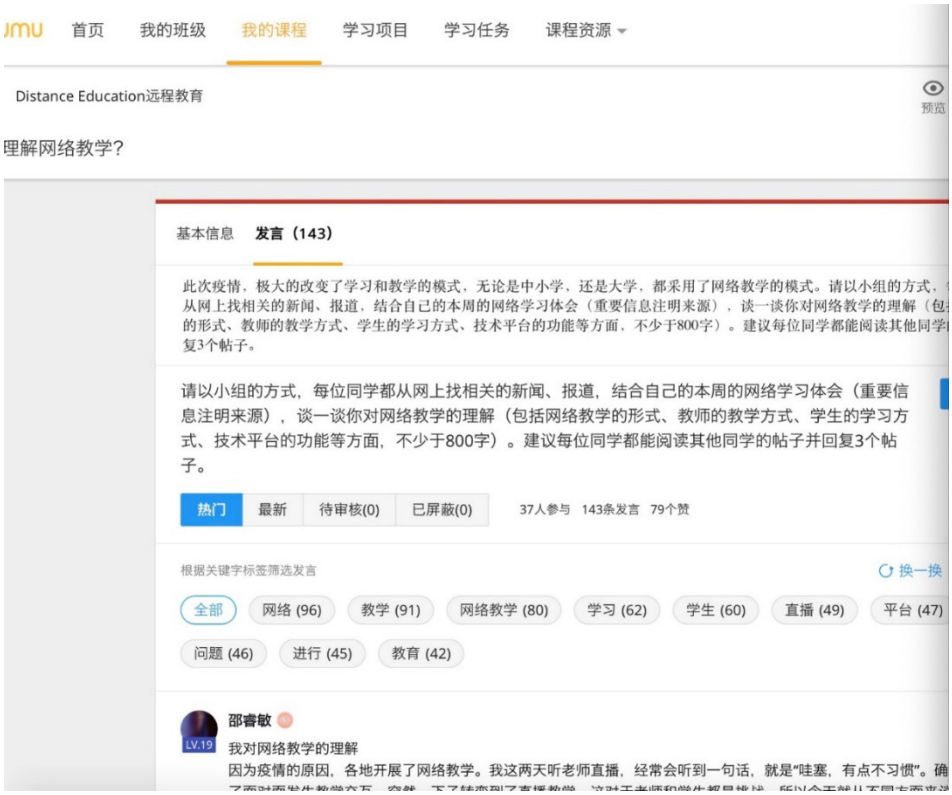


Figure 5. Open discussion about "online learning"

Story 4: The municipality of Italy-Torino is helping schools through open approaches and resources during COVID-19

The municipality of Turin, capital city of one of the mostly hit by the COVID-19, Italian regions has put in place a number of freely available services for school teachers and students, that share an open approach. Turin, which is a UNESCO learning city that hosts an important project called Riconnessioni (https://www.riconnessioni.it) as well as a network of innovative schools called DSchola (http://www.associazionedschola.it), is known in Italy for its innovation capacity.

During the lockdown, even if in Italy municipalities are not responsible for teachers, except for kindergartens and nurseries, the municipal educational authorities took different measures. First, they have been supporting families through economic facilitations, as they are not asked to pay for kindergartens, transportation or meals. From a pedagogical point of view, the Municipality has been supporting all those teachers, educators and pedagogical coordinators that are forced to work from home, preparing open contents for their students or sending homework to be carried out with the parents.

The city has also put special attention on social inclusion. The project Try Again, Sam is an initiative to contrast early school leaving that is becoming very relevant in this period: the Municipality is in close coordination with the educators supporting kids at risk of dropping out of school in order for them to keep the relations alive and to possibly make educational progresses. Another initiative focusing on digital solidarity is called #TorinoCityLove, through which, thanks to the collaboration of companies, open contents and training are offered for free to citizens, teachers and parents. This is very important since Italy is not leading the score of digital competencies, so everybody is making a great effort in these days to learn how to manage digital contents.

At the same time, the team at the Municipality of Turin is starting to rethink existing methodologies and more importantly to foster the citizens' understand that when this nightmare will be over, we cannot resume working in the same old way. All these initiative share the fact that they encourage the use of Open Educational Resources, as shown in Figure 6, and that they call for a strong participation of citizens, that are two characteristics that should remain also when the emergency will be over. Under this spirit, the Municipality has created a resources portal called Teaching the Neighborhood (Didattica della Vicinanza).

Figure 6. Italian open repository

Story 5: The application of OEP for K-12 in Korea: Open approaches and resources during COVID-19

Due to the COVID-19 pandemic, the Korean ministry of education recently announced that all schools and universities start their spring semester in early April remotely. In the meantime, to avoid the scarcity of learning opportunities due to the COVID-19 outbreak, the Korean government has aimed at promoting all K-12 students' self-directed learning via OERs. Since the Korean government announced the temporary closure of all schools, both the ministry of education and teacher communities released OERs and detailed learning schedule to follow. Moreover, a group of both primary school teachers launched their online services—such as 학교가자 .com, 바로학교 .com, and 안녕학교 .com, which also provide both instruction guidelines for teachers and learning resources for students, as shown in Figure 7. The developers of those services are school teachers, who proactively sought the needs for convenient and accessible pathways to distribute OERs to their learners and peer teachers. Those services guide teachers to connect with the current LMS systems - such as Classting and Wedorang, which have been widely used in Korea. Students on the other hand can participate in different

forums to exchange ideas and share thoughts on specific learning topics.

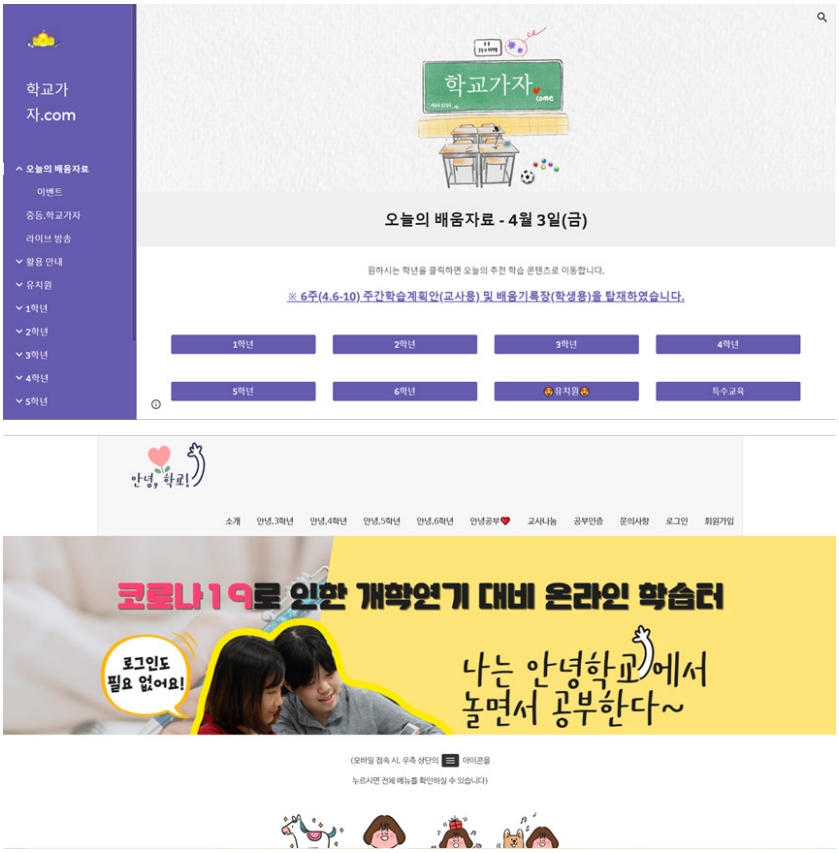


Figure 7. OERs designed by Korean teacher communities (top: 학교가자 .com, bottom: 안녕학교 .com)

Story 6: Universidad Internacional de La Rioja (UNIR-Spain) is applying open approaches during COVID-19

During the COVID-19 outbreak, several institutions are calling UNIR in these struggling times to request support for a quick migration of their educational methodologies and technology into an online setting. The university supports these requests at no charge and offers a consulting team to assist in the process. UNIR understands that the social responsibility of a university starts with open collaboration between colleagues, for a greater good. Additionally, open education becomes a key part of the university's strategy to combine Open, Universal and Free content (OUF) (Burgos, 2020) with proprietary services, and to find a balance between economic profit and social benefit, even during COVID-19 outbreak. In this context, The Open Education Hub (http://opened.unir.net) provides a number of courses in English, Spanish, French, Italian, Greek, Arabic and other languages, as shown in Figure 8. All of them are free of charge, and they all encourage the use, creation and sharing of open education good practices, with a special care on the integration of informal, formal and non-formal settings.

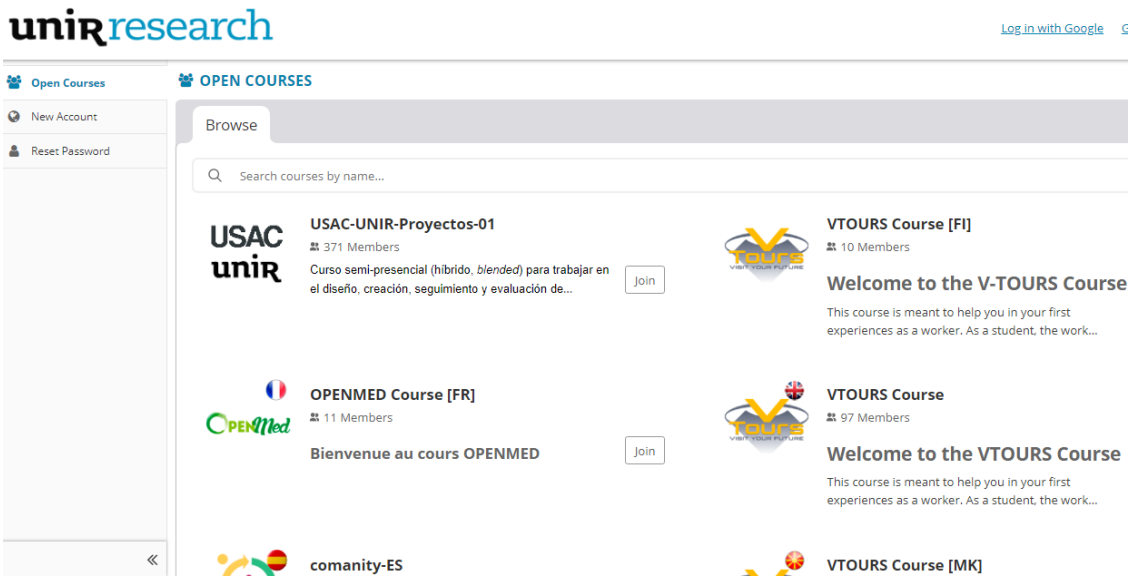


Figure 8. UNIR OER hub

Story 7: Open educational approaches in Russia during COVID-19

To mitigate the impact of the drastic changes in education delivery and to facilitate the continuity of the educational process nationwide, the Ministry of Education of the Russian Federation and the Ministry of Science and Higher Education of the Russian Federation introduced several initiatives. Since April 12, after the end of spring vacations, distance and open learning was organized for school and university students. For instance, Mosobrtv is the first educational television channel, where the school schedule and lessons are presented in live mode. Secondary school lessons are uploaded to Yandex.Uroki and can be watched at any time. OER are published on the following platforms: Federal Center of Information Educational Resources, Unified Collection of Digital Educational Resources, Edinoye Okno, Russian Electronic School and others.

Additionally, all publishers of textbooks have opened free access to their electronic textbooks. For example, electronic versions of educational and methodological complexes of the Prosveshchenie Publishing House are accessible without connecting to Internet. To provide free and open access to the catalog of interactive educational materials, e-books, training videos and courses, the Marketplace of Educational Services system has been created, so that leading Russian companies, including Yandex, 1C, Uchi.ru, Skyeng, Codwards, Prosveshchenie Publishing House and others, could share their resources. Foxford, InternetUrok.ru and Skyeng online school also opened free access to their resources, which allows students of 1-11 grades to continue to study and prepare for final exams and olympiads. Lessons are delivered by teachers from Moscow State University, Moscow Institute of Physics and Technology, Higher School of Economics and other leading universities.

The National Open Education Platform (see Figure 9), was launched by nine leading Russian universities with the support of the Ministry of Science and Higher Education of the Russian Federation. The high-quality online courses are designed primarily for students of higher educational institutions. Access to educational materials is free and open. As of April 2020, almost 560 courses are available on the platform. The National Open Education Platform is integrated into another online platform Modern Digital Educational Environment developed by the Ministry of Science and Higher Education of the Russian Federation, which helps university students to continue education according to the relevant programme and to obtain

official confirmation of achieved results upon successful completion of online courses. Open educational resources are also available through such online platforms as United Collection of Digital Educational Resources, Single Window, Russian Electronic School, National Open University Intuit, Stepik, Lektorium, Universarium, University without Borders, MIPT Lecture Hall, Postnauka, Arzamas and many others.

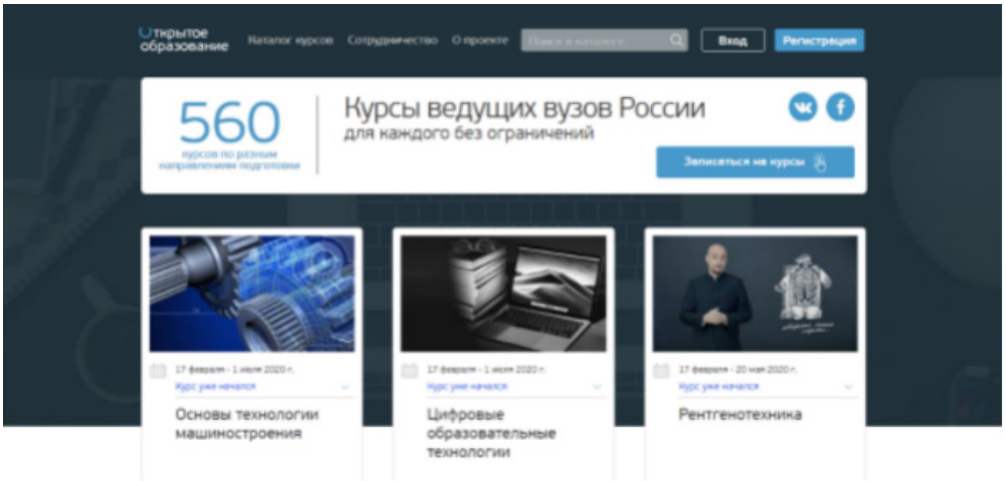


Figure 9. National Open Education Platform in Russia

UNESCO OER Objective. (v) Promoting and reinforcing international cooperation

(c) Supporting the creation and maintenance of effective peer networks that share OER, based on areas such as subject matter, language, institutions, regions and level of education at local, regional and global levels.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (v) Promoting and reinforcing international cooperation

(f) Supporting the contribution of intercultural communication skills, the management of multicultural groups, the design of communities of practice and community adjustment strategies in the local implementation of OER to promote universal values.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (ii) Developing supportive policy

(b) Encouraging and supporting research on OER, through relevant research programmes on OER development, sharing and evaluating, including the support of digital technologies (such as artificial intelligence)

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (ii) Developing supportive policy

(f) Addressing the inclusion of OER in transforming education, adjusting, enriching or reforming curricula and all forms of learning so as to exploit OER potentials and opportunities, and encouraging the integration of different teaching methods and forms of assessment to motivate the active use, creation and sharing of OER; and assessing the impact of OER on inclusive and equitable quality education.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

2.2.Challenges while applying open educational practices

Despite that OEP can enhance the learning outcomes, several challenges can be found as well. Some of these challenges are collected from the above stories during the application of OEP (see section 2.1). From the institutional perspective, schools and universities might find it challenging to adapt their pedagogy to OEP framework. Additionally, they do not recognize OEP in promotion and tenure policies. From the teacher perspective, some teachers fear losing control of the teaching process when inviting learners to be active participants by co-creating and contributing to the course activities. Some of them also lack the needed skills to incorporate OEP in their courses. From the student perspective, students are more familiar with traditional learning approaches, hence they might find it difficult to be self-regulated and adapt to an OEP-structured course. OEP essentially requires practitioners including teachers, learners as well as educators, to be more open, active participatory and innovative.

UNESCO OER Objective. (iv) Nurturing the creation of sustainability models for OER

(f) Providing mechanisms for the implementation and application of OER, as well as encouraging the feedback from stakeholders and constant improvement of OER.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (iv) Nurturing the creation of sustainability models for OER

(g) Optimizing existing education and research budgets and funds efficiently to source, develop and continuously improve OER models through inter-institutional, national, regional and international collaborations.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

3.OER competencies for applying open educational practices

Applying open educational practices require the (re)use of OER in different ways to allow students to be innovative and active, which result in better educational experience. Therefore, this section discusses several needed OER competencies for OEP (Gregoire & Dieng, 2016; Morgado, & Teixeira, 2015).

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(b) Providing systematic and continuous capacity building (in-service and pre-service) on how to create, access, make available, re-use, adapt, and redistribute OER as an integral part of training programmes at all levels of education, including assistance in initial training programmes for educators. This should include improving the capacity of public authorities, policy makers, as well as quality development and assurance professionals to understand OER and support their integration into learning, teaching, research and everyday life.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(f) Promoting digital literacy skills in order to master technical use of software, codes and open licenses with a view to encouraging the development and use of OER.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (ii) Developing supportive policy

(c) Developing mechanisms to support and incentivize all stakeholders to publish source files and accessible OER using standard open file formats in public repositories.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

3.1.Searching and selecting OER

3.1.1.Using generic and dedicated search engines

Generic search engines, such as Google and Baidu, can be used to find a specific OER. In this context, teachers or learners have to type in the search box the resources that they are looking for, and these engines will conduct deep searching, using their advanced and smart algorithms, to deliver the obtained results. Dedicated OER search engines (specifically to search OER, not generic) can also be used to find OER, such as CC search (https://search.creativecommons.org), OER Commons (https://www.oercommons.org) and Merlot. In this context, teachers and educators should be familiar with the search functionality in order to personalize the search options (e.g., type of the content, date, etc.) according to their needs. For instance, as showing in Figure 10, using 'advanced search' option of Google can help to narrow the search results, by language, region and even license.

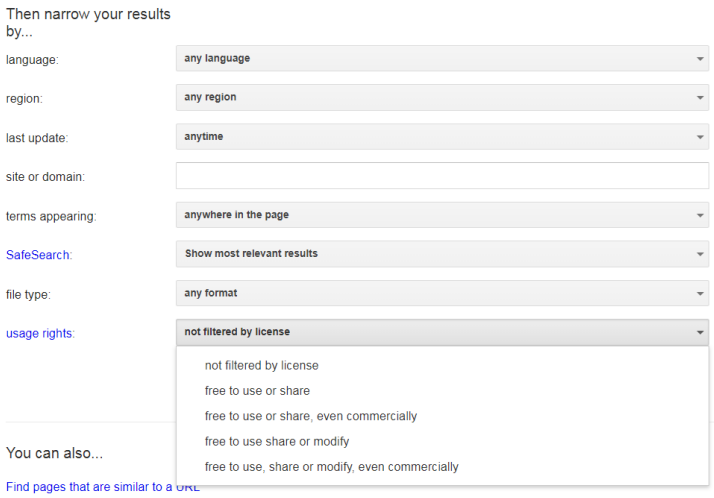


Figure 10. Advanced search interface of Google

Additionally, to have more accurate results, teachers and learners should be familiar with the following searching tricks.

- Use operators, such as “OER +” and “OER &” to include two or more terms: For instance, if teachers or learners want to search for technologies used with OER, it is possible to search in this way: OER + technology.

- Use the minus sign to eliminate results containing certain words, such as “OER -”: If the teacher wants to exclude results that contain certain terms, he/she can use the minus sign, for instance: OER –open data.

- Use an asterisk within quotes to specify unknown or variable words, such as “OER is *”: This is helpful if the teachers or learners are searching, for instance, for a specific definition, but they could not make out the entire phrase (e.g. “OER is a public resources that *”).

- Use quotes to search for an exact phrase, such as “OER is defined”: Searching a phrase in quotes will provide only pages with the same words in the same order as the way it is written in the quotes. This trick is important especially if the teacher or the learner is trying to find results containing a specific a phrase.

3.1.2.Using specific OER repositories

In this method, teachers and learners should have basic knowledge about the online available OER repositories and access to them to search for the needed OER. Table 1 shows examples of popular OER repositories along with some important features that could help teachers and learners select a particular repository. These features are (Santos-Hermosa, Ferran-Ferrer, & Abadal, 2017) : (1) Subject Domain refers to the discipline or subject covered by the repository; (2) Educational Level indicates the targeted educational sector by the repository (e.g., school education, higher education, K-12 or for all); (3) Resource Creator indicates if the published OER on the repository is created by institutions, everyone, etc.; and, (4) Educational Services includes the provided educational services to support both teachers and learners, such as learning Personalization, content recommendation, assessment dashboards and services and early detection of at-risk students.

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(e) Making available easily accessible resources that provide information and assistance to all OER stakeholders on OER-related topics, including copyright and open licensing of educational material.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

Note 3. Repository vs Directory vs Platform

A repository is a database where OER are stored and where users (teacher or learner) can search for a specific OER, view and download it, as well as its metadata.

A directory is an online list or a catalog of OER websites that users can access too.

A platform is an environment that provides different functionalities to create or (re)use OER for teaching and learning in different ways.

Table 1. Examples of OER repositories and MOOCs platforms

OER Repositories	Subject Domain	Educational Level	Resource Creator	Educational Services
OER Commons	Multidisciplinary	Different levels	Teachers	Share, download
OpenLearn	Multidisciplinary	Higher Education and Vocational Education	Everyone	Collaboration
MIT OCW	Multidisciplinary	Higher Education	Teachers Institutions	Category search guide
OpenStax	Multidisciplinary	Higher Education	Teachers Students	Online Recommendation
Connexions (OpenStax CNY)	Multidisciplinary	Higher Education	Teachers Students	Collaboration
African Storybook	Multidisciplinary	K12 Education	Teachers	Share, rate or comment
OER Africa	Multidisciplinary	College/university	Teachers	download
COL's Open Access Repository	Multidisciplinary	Higher Education K12-Education	Teachers	download
OpenupEd	Multidisciplinary	Higher Education	Institutions	Diversity
Curriki	Multidisciplinary	Cross-stage K12	Institutions	Diversity
The Orange Grove	Multidisciplinary	Higher Education K12-Education	Institutions	Dashboard Suggestion Box

NCLOR: Open Educational Resources	Multidisciplinary	Higher Education K12 Education	Institutions	Resource suggestion
*xuetangX	Multidisciplinary	Higher Education	Teachers Institutions	Category search guide
*iCourse	Multidisciplinary	Higher Education	Teachers Institutions	Category search guide
*eduYun	Multidisciplinary	K12 Education	Teachers Institutions	Dashboard

*denotes educational resources that reside in the public domain without any costs, but without an open license.

Note 4. Quality indicators of OER repositories

Several quality indicators are found which can help users (teachers or learners) select a particular OER repository, including: (1) User evaluation tools: tools that can be used by users to evaluate OER within the repository, such as the five-stars rating method; (2) Multilingual support: the designed repository interfaces support several languages, resulting in more users that can use this repository; (3) Use of standardized metadata: include standardized metadata, such as IEEE LOM or Dublin Core, to describe OER and facilitate its interoperability; and, (4) Comprehensive OER description: the repository should give comprehensive details about each OER, such as used open license, learning goal and keywords to describe this OER.

UNESCO OER Objective. (iii) Encouraging effective, inclusive and equitable access to quality OER

(f) Developing and adapting existing evidence-based standards, benchmarks and related criteria for the quality assurance of OER, as appropriate, which emphasize reviewing educational resources (both openly licensed and not openly licensed) under regular quality assurance mechanisms.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(d) Leveraging open licensed tools, platforms with interoperation of metadata, and standards (including national and international) to help ensure OER can be easily found, accessed, re-used, adapted and redistributed in a safe, secure and privacy-protected mode. This could include free and open source authoring tools, libraries and other repositories and search engines, systems for long-term preservation and frontier technologies for automatic OER processing and translation of languages (where appropriate or needed), such as artificial intelligence methods and tools.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

3.1.3.OER selection criteria

Teachers and learners can select the appropriate OER for them based on several criteria (Huang et al., 2020; De la Teja et al., 2007):

- Licensing: Educators should choose open license content, as this will allow them to legally reuse and remix these educational resources in their teaching context.
- Accuracy/quality of content: Several digital resources are published online without knowing the reliability of the content or the publisher. Therefore, educators should refer to reliable digital educational resources and platforms.
- Interactivity: Educators should choose interactive learning resources that can help increase the learning engagement and motivation of students. For instance, using interactive open textbooks, instead of simple PDF files, would make students more active and interested to learn.
- Design quality: Educators should choose OER which are well-designed (e.g., used colors, fonts, text size, navigation menu, etc.) as this will make the learning experience more convenient, hence have better learning outcomes.
- Ease of adaptability: Educators should choose OER which are easy to adapt in their context, i.e. resources which can be easily mixed or modified to fit a specific learning context. For instance, PPT presentations or videos can be good resources as they can be easily readapted.
- Cultural relevance & sensitivity: Educators should choose educational resources that do not report any offensive information to any given race or culture.

UNESCO OER Objective. (iii) Encouraging effective, inclusive and equitable access to quality OER

(f) Developing and adapting existing evidence-based standards, benchmarks and related criteria for the quality assurance of OER, as appropriate, which emphasize reviewing educational resources (both openly licensed and not openly licensed) under regular quality assurance mechanisms.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

3.2.Digital reading and summarizing OER

During the application of open educational practices, learners can go through several OER published in different web pages, to create new OER based on the previous ones. Afflerbach and Cho (2010) and Leu et al. (2015) mentioned that to acquire knowledge within digital environments from different sources, having digital reading skills is essential. These skills involve: (1) navigation of hypertext documents (e.g. selection of what sources to read, how to sequence the reading); (2) understanding and integrating different sources of information (e.g. connecting information from different web pages); and, (3) evaluation of information (e.g. evaluating the quality of the claims in a web page). Each of these skills is discussed below.

- Navigation: Before starting the search, learners must specify the problems that they are trying to answer. This can help learners to define what prior knowledge exists about this problem (that they are looking for) and what is still needed and is thus relevant for their task (Brand-Gruwel, Wopereis, & Walraven, 2009). To navigate from a web page to another, learners can follow two methods, namely coherence or interest (Cromley & Azevedo, 2009; Salmerón et al., 2005; van den Broek & Kendeou, 2015). In the “coherence” method, the learners read deeply each OER to understand it and then decide to which OER they should move next based on the new acquired knowledge. In the “interest” method, the learners do a quick screening to the OER and then decide if it is of interest to them or not. However, in this method, the learners might miss important information due to the speed of screening process.

- Integration: Learning materials in general, and OER specifically, from different sources can contain information that is partially overlapping, unique, or contradictory. When reading on the web, an important task is to identify and select information that should be included in the process of constructing an integrated representation of the material. One of the techniques to organize information from different OER is mind-mapping, a graphical way to represent ideas and concepts. Spencer, Anderson and Ellis (2013) stated that mind-mapping can enhance creative thinking and knowledge attainment. Wu and Chen (2018) stated that mind mapping can be used as a learning tool to promote thinking in both the left and right brain hemispheres of a student.

- Evaluation: Several OER are published online without knowing the reliability of the content. This makes the process of using OER very challenging. In this context, Stadtler and Bromme (2014) proposed two ways to distinguish the trustworthiness of the presented information. Learners can either make first-hand decisions by comparing what they read to what they believe to be true based on their world knowledge (i.e., they answer the question “what is true?”), or they can make secondhand decisions by investigating information source information (i.e., whom to believe?).

Besides, to summarize a given materiel, including OER, Plagly (2016) proposed the following steps.

Step 1: Read deeply the OER (or any other material) to better understand the content. Taking notes and highlights is not required during the first reading, since it is more about fully understanding the proposed information and details.

Step 2: Read through the document again and highlight the most important details (facts, concepts, definitions, opinions, etc.) using a pen or a marker.

Step 3: Based on the highlighted details (in step 2), choose the most relevant information to be included in your summary. Particularly, edit and refine your highlights with a short explanation until they cover the most important areas that you want to share in a comprehensive way. Each detail in your summary should be read and understood in a few minutes. Finally, make sure that the original OER (resource in general) is correctly cited.

Step 4: Read through the written summary, making sure that it flows from point to point and proof-read the content to avoid any grammar or spelling mistakes.

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(f) Promoting digital literacy skills in order to master technical use of software, codes and open licenses with a view to encouraging the development and use of OER.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

3.3.Creating, remixing and revising OER

3.3.1.OER creation

To simplify the process of creating and sharing OER, basic steps should be followed. Specifically, the following five steps are presented during the creation of a Word supplemental course material as OER.

Step 1: The teacher should prepare the learning content (text, pictures, link, etc.) within a Word document. During this process, the teacher should carefully check the accuracy of the provided information as well as the correct citation of others' work (see section 3.2). The teacher should also ensure that the provided content can be read by everyone by considering, for instance, text size, fonts, colors, spacing, etc.

Step 2: To ensure the accessibility to this created OER, the teacher can use the accessibility checker in Microsoft Word, as shown in Figure 11, to detect the content parts that might be challenging for persons with disabilities.

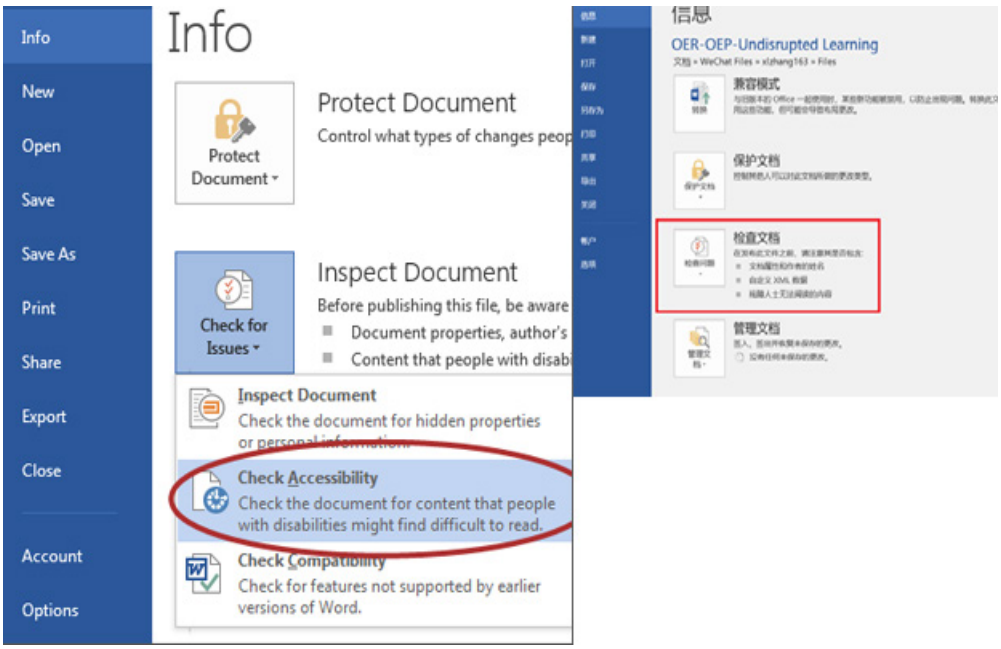


Figure 11. Accessibility checker in Microsoft Word

Step 3: The teacher should then add different tags to his/her OER, as shown in Figure 12. These tags should be related to the content of his/ her OER and will be used by search engines later on to find this OER. For instance, if the teacher is preparing an OER about distance education, he/she can use the following tags, online education, cyberlearning, synchronous learning, asynchronous learning, etc. Furthermore, several important information should be filled by the teacher, as shown in Figure 13, which can also help the indexing process of their OER by search engines, such as author, title, subject, etc.

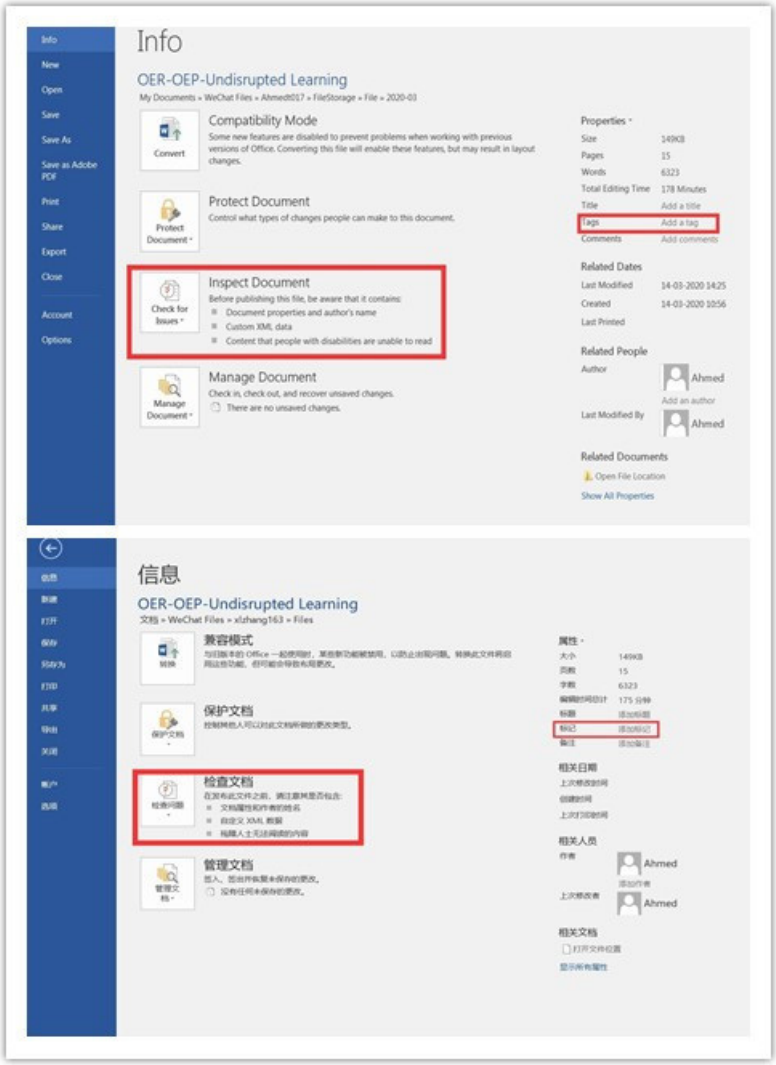


Figure 12. Adding tags in Microsoft Word

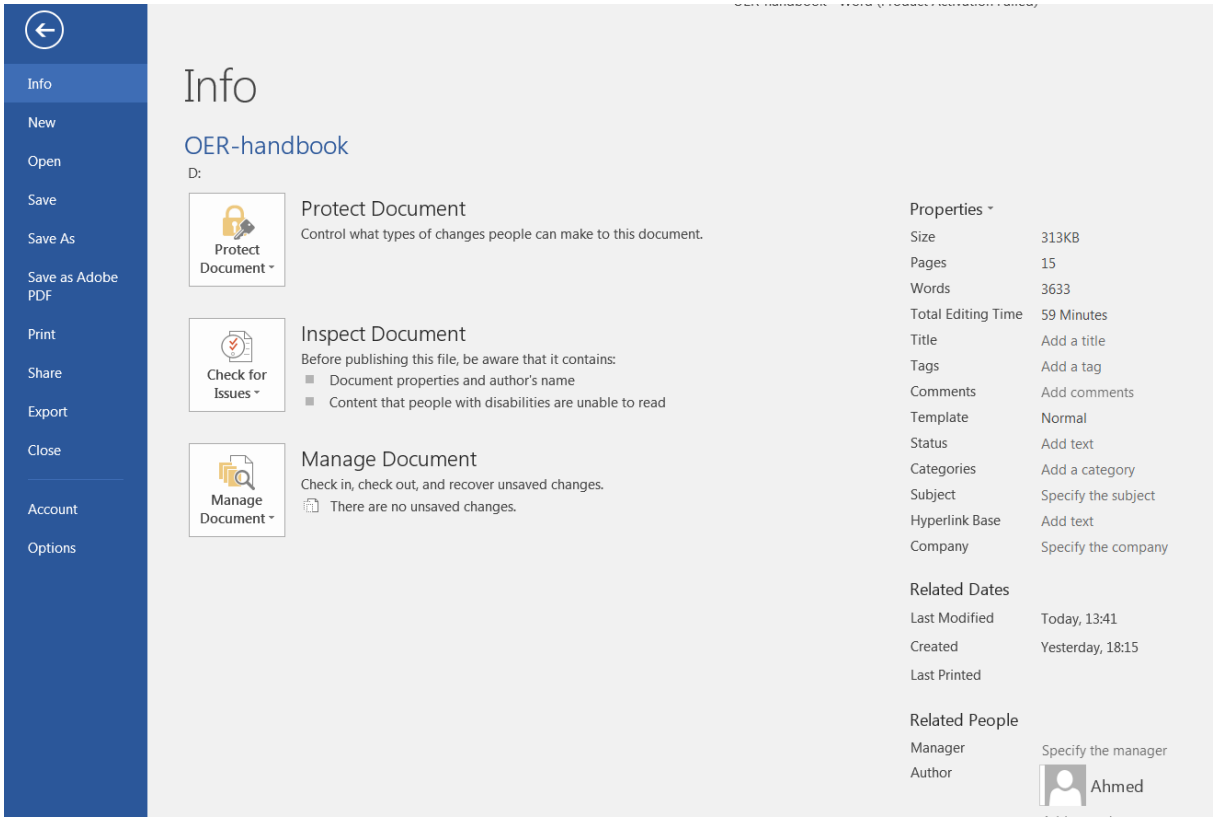


Figure 13. Adding important information, as tags, in Microsoft Word

Step 4: The teacher should attribute an open license to his/her OER. The attributed license should be carefully chosen to meet the preferred ways of using his/her OER in the future (see section 2 about how to choose an open license). At the end, the teacher can copy the needed license and paste it in his document, as shown in Figure 14.

Rights and Permissions

This publication is available in Open Access under the Attribution-ShareAlike 3.0 IGO (CC-BY-SA 3.0 IGO) license (http://creativecommons.org/license/by-sa/3.0/igo/).

Figure 14. An example of a CC license

Step 5: Finally, the teacher can save his/her Word document as PDF and share with others by publishing it on his/her personal website or by uploading it on a public OER repository. To promote their published OER, teachers and learners can use social networks to share links about their OER. They can also use institutional communities to share with their colleagues their OER.

Furthermore, several OER repositories and platforms are now offering integrated authoring tools to facilitate the process of creating OER that teachers and learners can further use, as mentioned in Table 2.

Table 2. Examples of OER authoring tools

OER authoring tools	Links
Open Author	https://www.oercommons.org/authoring-overview
Pressbooks Authoring	https://guide.pressbooks.com/
Connexions Authoring Tool	https://oeraccess.merlot.org/authoring_oer/index.html
H20 from Harvard Law	https://h2o.law.harvard.edu/
SoftChalk Cloud	https://www.softchalkcloud.com/
20 Million Minds Mix	https://20mmix.sharedbook.com/serve/ac/tmmix/login.html?next=/serve/ac/tmmix/

Note 5. Creation of OER content

While creating OER, authors (teachers or learners) must present the content in a well-structured way so others can easily read it and understand it. The authors should also develop their content in a comprehensive way, hence no extra material will be needed to understand the provided content. In this context, providing examples and case studies is recommended to explain a specific practice. This can help to reduce the cognitive load of learners.

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(e) Making available easily accessible resources that provide information and assistance to all OER stakeholders on OER-related topics, including copyright and open licensing of educational material.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

3.3.2.OER remixing and revising

Step 1: The teacher or learner should first search for the OER that he/she needs to remix. In this context, both teachers and learners should choose OER that can be easily remixed and adapted to their context. They should also pay attention to the attributed open license of the material to be used, as this can affect how this material can be remixed. This can also affect the new possible attributed open license to the new remixed OER by teachers or learners. More details about how to search OER are presented in section 3.

Step 2: The teacher or learner should then prepare the learning materials that they want to add to the original OER (identified in step 1). For instance, teachers or learners can remix or revise an OER by: (1) adding text as a description to a diagram or picture you are reusing; (2) combining your OER with the original OER. For instance, a teacher can add several slides to a PPT presentation he/she downloaded to meet his/her course needs; (3) inserting more sound effects (e.g., sound claps) to a video in order to make it more immersive; and, (4) translating it to different languages.

Step 3: The teachers or learners need to attribute a license to their new remixed OER. Please section 3 to learn more about how to select an open license.

Step 4: The teachers should assess the accessibility of their new remixed OER, for instance, using Accessibility Checker in Microsoft Word (see Figure 11) and add the needed information that facilitates the indexing of their OER later on, such as tags, author, subject (see Figure 13).

Step 5: The teachers or learners can share their remixed OER by sharing it on their personal websites or by uploading it on a public OER repository (see for instance table 1).

It should be noted that teachers and authors can also use authoring tools (see Table 2), as these tools also provide the possibility of remixing OER.

Note 6. Combination of open licenses for remixing OER

The following table shows which license types can be remixed with each other

License	CC BY	CC BY-SA	CC BY-NC	CC BY-ND	CC BY-NC-SA	CC BY-NC-ND
CC BY	✓	✓	✓	×	✓	×
CC BY-SA	✓	✓	×	×	×	×
CC BY-NC	✓	×	✓	×	✓	×
CC BY-ND	×	×	×	×	×	×
CC BY-NC-SA	✓	×	✓	×	✓	×
CC BY-NC-ND	×	×	×	×	×	×

3.4.Choosing an open license

A common misconception is that OER belong in the public domain, and that everyone can use it the way he/she wants, however this is not the case. In fact, an open license defines how others can use a particular OER. The World Intellectual Property Organization stated that open licenses help to protect two rights of OER authors and publishers (WIPO, 2016), namely: (1) Financial rights help OER publishers and authors gain money from others using their work; and, (2) Moral rights allow authors and creators to take certain actions to preserve and protect their link with their work. Specifically, Creative Commons (CC), launched in 2002, is currently the most used open license with OER. Therefore, to correctly create or (re)use a specific OER, teachers and learners must learn about open licenses, specifically CC. Table 3 shows the four conditions of Creative Commons (CC) license (a very popular open license) that teachers and learners can attribute to their OER to define how others can make use of them.

Table 3. The four license conditions

Definitions are taken as is from creativecommons.org

https://creativecommons.org/use-remix/cc-licenses/

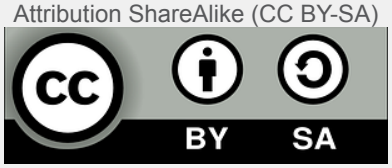
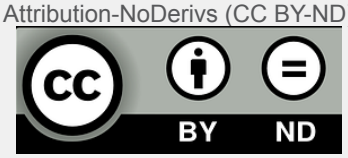
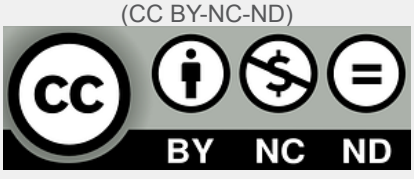
Conditions	Definition
	All CC licenses require that others who use your work in any way must give you credit the way you request, but not in a way that suggests you endorse them or their use. If they want to use your work without giving you credit or for endorsement purposes, they must get your permission first.
	You let others copy, distribute, display, perform, and modify your work, as long as they distribute any modified work on the same terms. If they want to distribute modified works under other terms, they must get your permission first.
	You let others copy, distribute, display, perform, and (unless you have chosen NoDerivatives) modify and use your work for any purpose other than commercially unless they get your permission first.
	You let others copy, distribute, display and perform only original copies of your work. If they want to modify your work, they must get your permission first.

Based on the above conditions in Table 3, six licenses can be attributed to OER, as described in Table 4.

Table 4. The six CC copyright licenses

Definitions are taken as is from creativecommons.org

https://creativecommons.org/use-remix/cc-licenses/

Conditions	Definition
Attribution (CC BY) 	This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials.
Attribution ShareAlike (CC BY-SA) 	This license lets others remix, tweak, and build upon your work even for commercial purposes, as long as they credit you and license their new creations under the identical terms. This license is often compared to “copyleft” free and open source software licenses. All new works based on yours will carry the same license, so any derivatives will also allow commercial use. This is the license used by Wikipedia, and is recommended for materials that would benefit from incorporating content from Wikipedia and similarly licensed projects.
Attribution-NoDerivs (CC BY-ND) 	This license lets others reuse the work for any purpose, including commercially; however, it cannot be shared with others in adapted form, and credit must be provided to you.
Attribution-NonCommercial (CC BY-NC) 	This license lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don’t have to license their derivative works on the same terms.
Attribution-NonCommercial ShareAlike (CC BY-NC-SA) 	This license lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms.
Attribution-NonCommercial-NoDerivs (CC BY-NC-ND) 	This license is the most restrictive of our six main licenses, only allowing others to download your works and share them with others as long as they credit you, but they can’t change them in any way or use them commercially.

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(c) Raising awareness concerning exceptions and limitations for the use of copyrighted works for educational and research purposes. This should be enacted to facilitate the integration of a wide range of works in OER, recognizing that the fulfilment of educational goals as well as the development of OER requires engagement with existing copyright protected works.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

(e) Making available easily accessible resources that provide information and assistance to all OER stakeholders on OER-related topics, including copyright and open licensing of educational material.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (v) Promoting and reinforcing international cooperation

(e) Exploring the development of an international framework for copyright exceptions and limitations for education and research purposes to facilitate cross-border exchange and cooperation on OER.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

Note 7. OER should have an open license

If an OER is shared in the public domain, it does not imply that it can be used without any restrictions. In fact, each OER should have an open license that defines how it can be used by others (legal grounds).

Story 8: CC-By license for OER about prevention against COVID-19 by the Smart Learning Institute of Beijing Normal University (SLIBNU)

Several open courses and thematic teaching resources focusing on the epidemic have been produced, including patriotic education, epidemic prevention knowledge, psychological knowledge, and other resources of different disciplines. The SLIBNU, in collaboration with the Arab League Educational, Cultural, and Scientific Organization (ALECSO) and the Universidad Internacional de la Rioja (UNIR), has created a series of OER about coronavirus protection (see http://sli.bnu.edu.cn/en/Courses/Webinars/Coronavirus_Prevention). These OER were under a CC-By license that gives more freedom to users to reuse the content in their context in order to raise health awareness against the virus. Consequently, as shown in Figure 15, the series was translated to eleven languages, namely: Chinese, English, Arabic, Spanish, German, French, Japanese, Urdu, Korean, Persian and Bengali.

Figure 15. Coronavirus series as OER

4.Typical OER-enabled distance learning strategies

Several distance learning strategies are now using OER to provide accessible learning or diversified learning contents for students. Examples of these strategies, reported during COVID-19 outbreak, are discussed in this section.

Note 8. OER does not mean distance learning

OER can be produced as digital materials (e.g., videos, audio, presentations, etc.) or paper-based materials (e.g., printed books, etc.). Therefore, it does not only mean distance learning. However, OER can be used to support distance learning. Particularly, OER are mostly produced as digital resources to facilitate their reuse by others (i.e., it will be easier to reuse a PPT presentation, as OER, than a printed book.).

4.1.Massive open online learning courses

OER and their offspring, Massive Open Online Courses (MOOCs), are becoming important factors in achieving the Sustainable Development Goal 4: Quality Education (SDG4). MOOCs are online courses that support unlimited participation and open access via the web. Particularly, MOOCs provide learning materials in an interactive way, by using videos, quizzes, instant feedback and assignments. They also support social interaction via forums, real-time chat functionality and social media. During COVID-19 outbreak, several Institutions provided MOOCs for their students to maintain undisrupted learning from home.

Note 9. MOOCs are not OER

MOOCs differ from OER in that it opens up opportunities for learners to participate in learning activities, rather than making resources or courseware openly available. Specifically, OER focus on the content (learning material), while MOOCs are a new way of teaching online. Additionally, OER are defined by the 5R permissions (reuse, revise, remix, retain, and redistribute), while MOOCs are not. Finally, MOOCS can be created based on several OER (e.g., videos, presentations, etc.)

Story 9: The use of MOOCs during COVID-19 in different countries

The national public service platform for educational resources is an initiative of the central government of China in providing basic public services for education. The platform creates a network of communication, sharing and application environment for resources providers and users, and serves all levels of education. Large amounts of resources have been provided for teachers and students of schools at all levels, including digital resources that are synchronized with classroom teaching in primary and secondary school (e.g., teaching plans, coursewares, teaching videos, course materials), problem sets and tests database for the high school entrance examination and the college entrance examination. Additionally, the platform also provides MOOCs for students, teachers and principals of schools at all levels, and resources for vocational education, safety education, moral education, education for physical, health and art. In order to support the "Disrupted Classes, Undisrupted Learning" during the coronavirus outbreak, the ministry of education of PRC quickly launched the National Network Cloud Platform for Primary and Secondary School based on National Public Service Platform for Educational Resources, as shown in Figure 16. To meet the students' learning demands in this special period, appropriate resources modules of 10 topics in time were added to the platform, including epidemic prevention education, moral education, curriculum learning, life and safety education, mental health education, family education, classic reading, trip learning education, film and television education, and electronic books.

Figure 16. National Public Service Platform for Educational Resources
Source: http://www.eduyun.cn/

On the first day of operation on February 17, 2020, the platform had more than 8 million clicks with millions of users covering 31 provinces of China. Users also from 47 countries and regions logged in to this platform. About 85 percent of visitors used mobile devices, such as smart phones and tablets.

In Romania, several universities include MOOCs in their academic courses (Holotescu et al., 2014; Holotescu, Andone & Grosseck, 2016). West University of Timișoara (http://www.uvt.ro) has been successfully used the MOOC-based teaching method, in order to engage and motivate students. MOOCs are included in the program of complementary disciplines, which generate transversal competencies, accessible to students from all majors (http://novamooc.uvt.ro, https://west-university-timisoara.teachable.com).

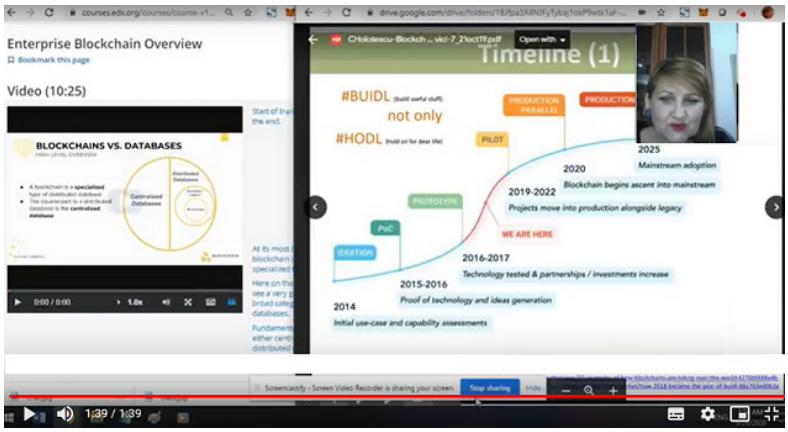


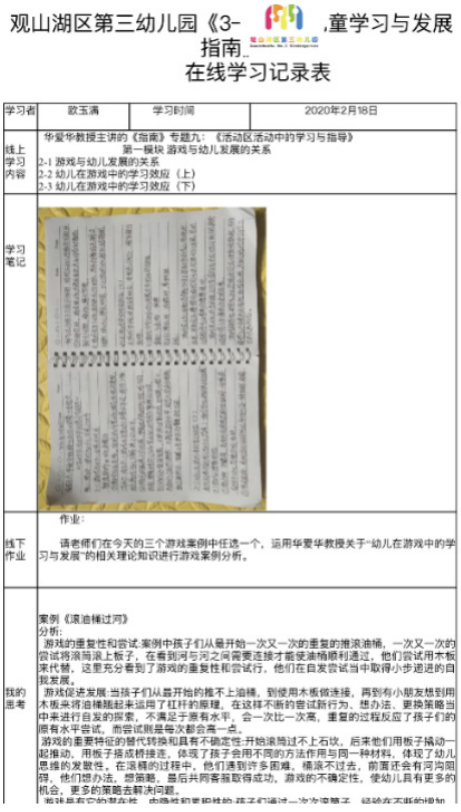
Figure 17. Video lecture in an online course with MOOC integration (http://islavici.ro/softstudenti)

Besides, the eLearning Center (CeL) (http://elearning.upt.ro) has developed and managed the Virtual Campus and MOOC platform of Politehnica University of Timisoara (http://cv.upt.ro, http://unicampus.ro); also CeL runs daily webinars about online learning and OER/MOOC integration, to then be shared with CC licenses on CeL's YouTube channel for future reuse. Additionally, supported and trained by the Center for Open Education and Blockchain, the teachers of "Ioan Slavici" University of Timisoara facilitated courses integrating MOOCs, using the university platform (http://islavici.ro/softstudenti) or different free applications, as shown in Figure 17.

Story 10. Providing open trainings for kindergarten teachers (especially in rural areas) at the Open University of China

After the outbreak of COVID-19 epidemic in 2020, the Open University of China (OUC) actively responded to the call of the Chinese Ministry of Education about postponing the spring semester, and providing online learning opportunities through Open Educational Resources (OER) that everyone can access to, especially those in rural areas. For instance, the OUC has provided a course entitled the Guide for Learning and Development of Children Aged 3-6 Years for kindergarten teachers to improve their professional skills during the COVID-19 pandemic.

In Guiyang, with the rapid development of preschool education, there is a great demand and an urgent need to train kindergarten teachers. However, due to the lack of funds and high-quality resource platforms, teachers in rural areas do not have the opportunity to participate in any training programs, and they have scarce access to quality online OER. Therefore, to overcome these problems, the Municipal Education Bureau organized for kindergarten teachers in rural areas open trainings based on OER. The training team of the Bureau created a unified learning plan where the teachers had to go through different learning resources and submit their activities online. This helped them to combine their working practice with their own professional development in the learning process, and carried out in-depth learning in a focused and phased manner through the mode of "online self-study + submission of assignment + online discussion + summary and reflection". Additionally, the trainers used social network applications, such as WeChat, to create open communities where teachers can exchange opinions and feedback, hence help each other progress (see Figure 18). Furthermore, to keep the teachers active, they were requested after each online session to summarize what they learned and post it on their webblog. As one teacher said, "this online and open learning experience has accompanied rural preschool teachers through the hard time of the pandemic, but a moving and fruitful professional development."



观山湖区第三幼儿园《3-[illegible],童学习与发展指南》
在线学习记录表

学习者	欧玉清	学习时间	2020年2月18日
线上学习内容	华爱华教授主讲的《指南》专题九：《活动区活动中的学习与指导》 第一模块 游戏与幼儿发展的关系 2-1 游戏与幼儿发展的关系 2-2 幼儿在游戏中的学习效应（上） 2-3 幼儿在游戏中的学习效应（下）		
学习笔记			
线下作业	作业： 请老师们在今天的三个游戏案例中任选一个，运用华爱华教授关于"幼儿在游戏中的学习与发展"的相关理论知识进行游戏案例分析。		
我的思考	案例《滚油桶过河》 分析： 游戏的重复性和尝试.案例中孩子们从最开始一次又一次的重复的推滚油桶，一次又一次的尝试将滚筒滚上板子，在看到河与河之间需要连接才能使油桶顺利通过，他们尝试用木板来代替，这里充分看到了游戏的重复性和尝试行，他们在自发尝试当中取得小步递进的自我发展。 游戏促进发展:当孩子们从最开始的推不上油桶，到使用木板做连接，再到有小朋友想到用木板来将油桶翻起来运用了杠杆的原理，在这样不断的尝试新行为、想办法、更换策略当中来进行自发的探索，不满足于原有水平，会一次比一次高，重复的过程反应了孩子们的原有水平尝试，而尝试则是每次都会高一点。 游戏的重要特征的替代转换和具有不确定性.开始滚筒过不上石坎，后来他们用板子搞动一起推动，用板子搭成桥接连，体现了孩子会用不同的方法作用与同一种材料，体现了幼儿思维的发散性，在滚桶的过程中，他们遇到许多困难，桶滚不过去，前面还会有河沟阻碍，他们想办法，想策略，最后共同客服取得成功，游戏的不确定性，使幼儿具有更多的机会，更多的策略去解决问题。		

Figure 18. One learner's summary report

4.2.Simulation and open game-based learning

Story 11: Using the open game Minecraft in Porter-Gaud School, USA during COVID-19 outbreak

Educational games are one of the methods that researchers have used in order to increase learners' learning motivation and engagements (Tlili, Essalmi, & Jemni, 2016). In this context, to provide an engaging and innovative learning experience during the COVID-19 outbreak, Porter-Gaud School used game-based learning approaches. Specifically, twenty-three children in Zoom, connected to the open game Minecraft Education Edition (see Figure 19). They then started working in teams of six, and collaborating together to build their ideal home for quarantine within an open game environment. Additionally, to foster the motivation of learners and support open assessment, several National Minecraft EE experts were invited to join to further assess the work of the learners and give their feedback.

Figure 19. Game screen of Minecraft Education Edition (https://education.minecraft.net/)

4.3.Telecourses

To ensure open accessible learning experiences, during COVID-19 outbreak, for those who do not have Internet connection especially in remote areas, courses and assignments were provided via televisions.

Story 12: Providing inclusive open learning via TV for remote areas during COVID-19 outbreak

Four channels of China Education Television started open broadcasting of primary and middle school classes across the nation covering 75 lessons on air to provide open learning experiences for those in remote areas without Internet or without cable TV, as shown in Figure 20. Similarly, Tunisia created a new third national TV channel during COVID-19 to provide on it daily courses for all students in all grades.

Figure 20. Telecourses in China during COVID-19 outbreak

UNESCO OER Objective. (iii) Encouraging effective, inclusive and equitable access to quality OER

(a) Ensuring access to OER that most suitably meets both the needs and material circumstances of target learners and the educational objectives of the courses or subjects for which they are being provided. This would include offline (including printed) modalities for accessing resources where appropriate.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (iii) Encouraging effective, inclusive and equitable access to quality OER

(d) Ensuring public investments and incentivizing private investments in ICT infrastructure and broadband, as well as other mechanisms, to provide increased access to OER, particularly for low-income, rural and urban communities.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

5.Guidelines for applying open educational practices

This handbook presented, through vivid global stories, practical experiences on the application of OEP and OER during COVID-19 break. Particularly, based on these reported practical experiences and stories, to ensure an active and engaging teaching experience using OEP for better learning outcomes, teachers should refer to the following guidelines:

- Yang (2020) mentioned that copyright is one of the challenges of using online resources. Indeed, during OEP development, teachers should pay attention to the attributed open licence of each OER to ensure its legal use in their context.

- Teachers might not be familiar with the process of choosing the most suitable resources to use in their teaching processes. In this context, Ozdemir and Bonk (2017) pointed out that searching for high-quality OER among the thousands that are published is a difficult task. Therefore, teachers should consider the quality of the OER they would use by referring to well-known national and international OER repositories, such as the MoE, the Massachusetts Institute of Technology (MIT), Commonwealth of Learning – OAsis OER and Open Knowledge Repository. Additionally, assessing and selecting high-quality OER is one of the most challenging tasks while using OER. OER can be selected based on several criteria, including licensing, accuracy/quality of the content, interactivity, ease of adaptability, and cultural relevance and sensitivity.

- Teachers might lack the technical skills to develop their OER. Therefore, to properly create and publish OER, teachers can refer to several national and international authoring tools, such as 101ppt software and ALESCO Hub, Connexions repository authoring tool or Open Author, where the learning resources could be simply created via simple clicks and where no specific technical skills are needed.

- During the teaching process, teachers should apply open teaching to engage learners and encourage them to participate in the co-creation of knowledge (Nascimbeni & Burgos, 2016). For instance, teachers can ask students to update a given blog related to a specific learning topic using the Baidu encyclopaedia (Wiki pages, for international readers). Additionally, teachers can apply the connectivist learning approach (Goldie, 2016) by asking students to write reports as OER on a given topic as well as create new exercises for a specific chapter in an open textbook based on several references

and resources. This can help learners gain digital literacy skills (searching, assessing, and identifying online resources) which are fundamental for 21st-century literacy. Particularly, teachers can ask students to work on public Tencent documents (Google Docs, for international readers), where they can see one another's work and progress. This can emphasise peer assessment and reflective practices.

- To facilitate the application of OEP, teachers should select friendly learning tools and technologies that learners are already familiar with. They should also avoid overloading learners by asking them to use too many tools, resulting in inconvenient learning practices for them. Additionally, teachers can refer to open software because by nature it can be modified and adapted to different needs, fulfilling more accessibility requirements than proprietary software (Zhang et al., 2020). For instance, the open source learning management system Moodle was adapted to cover new functionalities (Denden, Tlili, Essalmi, Jemni, Chang, & Huang, 2019).

- Learning is facilitated not only by teachers but also by peers (Hegarty, 2015). Therefore, to make the teaching process more interactive, teachers can build open learning communities where the students can openly exchange ideas, create discussions, and collaborate on different tasks. To ensure interactive and open learning communities, teachers should use social networks during the learning process, such as Wechat, QQ, and Sina Weibo, Facebook or Twitter. By using these social networks, teachers can share questions related to specific course materials, and students can discuss them to determine specific answers. Consequently, students learn by exchanging ideas and opinions. Furthermore, the jigsaw classroom pedagogy (invented and named in 1971 by Elliot Aronson) can be applied online by dividing the assignment into several tasks and making each team work on a specific task. The teams will use social networks to work together, communicate with one another, and deliver their assignments. This will foster both individual accountability and the achievement of team goals. Additionally, the open learning within social networks can be gamified using Emojis to make the learning process more engaging and interactive. For instance, Saif, Tlili, Essalmi, and Jemni (2019) used, during the learning process on Facebook, the number of given "likes" on a particular learner's answer as the score he/she gets for that answer.

- During the learning process that utilises OER and OEP, teachers should act as facilitators of the learning process. For instance, teachers can help their students with their reports by suggesting useful references that they should read. Teachers should also have an active role in building a trustworthy learning environment by continuously encouraging their students to share their opinions and answers. Hegarty (2015) mentioned that building trust and self-confidence is an important factor in open learning environments so as to achieve excellent learning outcomes.

- Wiley (2013) mentioned that 'disposable assignments', meaning assignments which are forgotten right after the course and do not benefit anyone, should be replaced with activities that both teachers and learners can work on and that can benefit others. Therefore, open learning materials delivered by learners (e.g. reports, presentations, videos), under the supervision of teachers, can be collected as open textbooks and uploaded online so that other students and teachers (future generations) can benefit from them. Additionally, learning achievements can be measured within OEP by referring, for instance, to the interaction frequency in open learning discussions as well as the number of finished (uploaded or shared) assignments.

- Traditional paper–based assessments are no longer effective. Therefore, to assess learners in open learning environments, teachers should use project-based assessments (Dori, 2003) based on the OER delivered by learners. In this context, teachers can invite their students to open presentations (where parents and other teachers can attend) of their delivered projects for assessment and grading. This can be achieved via several platforms that support live-video communication, such as Dingtalk, Zoom or Skype.

Note 10. OER and OEP adoption requires the involvement of different stakeholders

To facilitate OEP and OER adoption among teachers and learners, several stakeholders (governmental, institutional or organizational) should be involved. For instance, institution directors can initiate policies to encourage teachers and learners to use and share OER and OEP by providing extra bonus money. Also, governmental policy makers can launch initiatives to help teachers and learners gain the needed skills to adopt OER and OEP in their respective conexts.

To ensure an active and engaging learning experience using OER and OEP for better learning outcomes, learners should refer to the following guidelines:

- Just like teachers, learners should pay attention to the attributed open licence of each OER to ensure its legal use in their context, as some combination of licenses, for instance, do not allow OER remixing.

- Learners should carefully search for, select, and summarise information while preparing their content (e.g. assignments, presentations, videos, reports) to ensure high-quality OER.

UNESCO OER Objective. (v) Promoting and reinforcing international cooperation

(a) Promoting and stimulating cross-border collaboration and alliances on OER projects and programmes, leveraging existing transnational, regional and global collaboration mechanisms and organizations. This should include joining efforts on collaborative development and use of OER as well as capacity building, repositories, communities of practice, joint research on OER and solidarity between all countries regardless of their state of OER development.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

- Thousands of OER are published online without knowing the reliability of the authors. Therefore, learners should remember to attribute open licences to their prepared open learning materials so they can be reused by others as OER.

- To develop their independence and capacity to self-regulate within open learning experiences, learners must develop such skills as behavioural self-regulation and emotional self-regulation. For instance, learners should maintain a positive attitude when facing learning challenges and consider these challenges as new learning opportunities.

- Learners should be collaborative and active in building an open learning community by encouraging their peers and participating in discussions.

UNESCO OER Objective. (iv) Nurturing the creation of sustainability models for OER

(f) Providing mechanisms for the implementation and application of OER, as well as encouraging the feedback from stakeholders and constant improvement of OER.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

UNESCO OER Objective. (iii) Encouraging effective, inclusive and equitable access to quality OER

(a) Ensuring access to OER that most suitably meets both the needs and material circumstances of target learners and the educational objectives of the courses or subjects for which they are being provided. This would include offline (including printed) modalities for accessing resources where appropriate.

Source: Recommendation on Open Educational Resources (OER), UNESCO, 2019

6.Conclusions and implications

This handbook aims to show the implications of using Open Educational Practices (OEP) and Open Educational Resources (OER) on learning outcomes in line with UNESCO recommendation. Particularly, it reports, through vivid global stories, practical experiences use of OEP and OER during COVID-19 pandemic. The following conclusions are finally identified and in line with UNESCO OER recommendation.

- OEP can expand the opportunity of accessing high-quality educational contents for learners by: (1) crating and (re)using OER in innovative ways, such as via social networks; and, (2) providing active and engaging learning experiences where learners participate in are the knowledge creation process. This can help in achieving accessible and lifelong learning.

- OEP is a practice-centered approach that consists of five enablers namely OER, open teaching, open collaboration, open assessment, and enabling technology. All these enablers are interrelated, and the relations among them are mediated by technology.

- Learners are encouraged, during the learning process using OEP, to search for, select, and use high-quality OER while preparing their content (e.g. assignments, presentations, videos, reports). They are also required to attribute open licences to their prepared open learning materials so other learners can reuse them as OER.

- Open teaching approaches within OEP are recommended to engage learners and develop their self-regulation skills by making them participate in the co-creation of knowledge, and encouraging their peers within open learning communities.

- The role of teachers within OEP is more as a facilitator where they monitor students' activities and offer assistance and encouragements when needed.

- Project-based assessments are recommended to evaluate the artifacts and works published as OER by learners. For instance, OER project-based assessment can cover the following evaluation criteria: (1) the quality of the created OER by teams; (2) the collaboration between team members when creating this OER; and, (3) attributed license and accessibility of the OER. The assessment goal is to promote the learners' personal growth and career development, especially in collaborative environments like OEP.

Besides, the following recommendations are identified to promote lifelong and inclusive learning using OER and OEP.

- Developing universal courses as OER can achieve universal values (e.g., social progress and equal rights) regardless of each country's culture and educational program. This facilitates knowledge learning and acquiring new skills that are needed to survive in a rapidly evolving knowledge-based world.

- Encouraging the integration of OER in different learning mediums (online and offline), such as web platforms, television, radios, and printed materials can increase knowledge access to meet the needs and material circumstances of target learners and the educational objectives of different courses or subjects.

- Establishing innovative mechanisms on the use and development of OER with emerging technologies (e.g., AI or AR/VR) to provide immersive and innovative open learning experiences using OER.

- Facilitating research on issues related to AI ethics, privacy and data protection in terms of sharing and applying OER, OER infrastructure and related services to ensure sustainable and secure development of open education.

- Designing new models of training (online or on-campus) about open education for several stakeholders (e.g., learners, teachers, administrative staff, directors) to help them learn about innovative open school services that can be explored (e.g., open libraries or open curriculum).

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APPENDIX : Excerpts from UNESCO Recommendation on Open Educational Resources (OER)[1]

The General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO), meeting in Paris from 12 to 27 November 2019, at its 40th session.

This Recommendation addresses five objectives: (i) building capacity of stakeholders to create, access, re-use, adapt and redistribute OER; (ii) developing supportive policy; (iii) encouraging inclusive and equitable quality OER; (iv) nurturing the creation of sustainability models for OER, and (v) facilitating international cooperation.

(i) Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER

Member States are recommended to strategically plan and support OER capacity building, awareness raising, use, creation and sharing at the institutional and national levels, targeting all education sectors and levels. Member States are encouraged to consider the following:

(a) Building awareness among relevant stakeholder communities on how OER can increase access to educational and research resources, improve learning outcomes, maximize the impact of public funding, and empower educators and learners to become co-creators of knowledge.

(b) Providing systematic and continuous capacity building (in-service and pre-service) on how to create, access, make available, re-use, adapt, and redistribute OER as an integral part of training programmes at all levels of education, including assistance in initial training programmes for educators. This should include improving the capacity of public authorities, policy makers, as well as quality development and assurance professionals to understand OER and support their integration into learning, teaching, research and everyday life.

(c) Raising awareness concerning exceptions and limitations for the use of copyrighted works for educational and research purposes. This should be enacted to facilitate the integration of a wide range of works in OER, recognizing that the fulfilment of educational goals as well as the

1 http://portal.unesco.org/en/ev.php-URL_ID=49556&URL_DO=DO_TOPIC&URL_SECTION=201.html

development of OER requires engagement with existing copyright protected works.

(d) Leveraging open licensed tools, platforms with interoperation of metadata, and standards (including national and international) to help ensure OER can be easily found, accessed, re-used, adapted and redistributed in a safe, secure and privacy-protected mode. This could include free and open source authoring tools, libraries and other repositories and search engines, systems for long-term preservation and frontier technologies for automatic OER processing and translation of languages (where appropriate or needed), such as artificial intelligence methods and tools.

(e) Making available easily accessible resources that provide information and assistance to all OER stakeholders on OER-related topics, including copyright and open licensing of educational material.

(f) Promoting digital literacy skills in order to master technical use of software, codes and open licenses with a view to encouraging the development and use of OER.

(ii) Developing supportive policy

Member States, according to their specific conditions, governing structures and constitutional provisions, should develop or encourage policy environments, including those at the institutional and national levels, that are supportive of effective OER practices. Through a transparent participatory process that includes dialogue with stakeholders, Member States are encouraged to consider the following:

(b) Encouraging and supporting institutions to develop or update legal or policy frameworks to stimulate the creation, access, re-use, re-purpose, adaptation and redistribution of quality OER by educators and learners in a manner consistent with national copyright legislation and international obligations; and to develop and integrate a quality assurance mechanism for OER into the existing quality assurance strategies for teaching and learning materials.

(d) Developing mechanisms to support and incentivize all stakeholders to publish source files and accessible OER using standard open file formats in public repositories.

(f) Addressing the inclusion of OER in transforming education, adjusting, enriching or reforming curricula and all forms of learning so as to exploit OER potentials and opportunities, and encouraging the integration of different teaching methods and forms of assessment to motivate the active use, creation and sharing of OER; and assessing the impact of OER on inclusive and equitable quality education.

(g) Encouraging and supporting research on OER, through relevant research programmes on OER development, sharing and evaluating, including the support of digital technologies (such as artificial intelligence).

(iii) Encouraging effective, inclusive and equitable access to quality OER

Member States are encouraged to support the creation, access, re-use, re-purpose, adaptation and redistribution of inclusive and equitable quality OER for all stakeholders. These would include those learners in formal and non-formal education contexts irrespective of, inter alia, age, gender, physical ability, and socio-economic status, as well as those in vulnerable situations, indigenous peoples, those in remote rural areas (including nomadic populations), people residing in areas affected by conflicts and natural disasters, ethnic minorities, migrants, refugees, and displaced persons. In all instances, gender equality should be ensured, and particular attention paid to equity and inclusion for learners who are especially disadvantaged due to multiple and intersecting forms of discrimination. Member States are recommended to consider the following:

(a) Ensuring access to OER that most suitably meets both the needs and material circumstances of target learners and the educational objectives of the courses or subjects for which they are being provided. This would include offline (including printed) modalities for accessing resources where appropriate.

(d) Ensuring public investments and incentivizing private investments in ICT infrastructure and broadband, as well as other mechanisms, to provide increased access to OER, particularly for low-income, rural and urban communities.

(f) Developing and adapting existing evidence-based standards, benchmarks and related criteria for the quality assurance of OER, as appropriate, which emphasize reviewing educational resources (both openly licensed and not openly licensed) under regular quality assurance mechanisms.

(iv) Nurturing the creation of sustainability models for OER

Member States, according to their specific conditions, governing structures and constitutional provisions, are recommended to support and encourage the development of comprehensive, inclusive and integrated OER sustainability models. Member States are encouraged to consider the following:

(c) Promoting and raising awareness of other value-added models using OER across institutions and countries where the focus is on participation, co-creation, generating value collectively, community partnerships, spurring innovation, and bringing people together for a common cause.

(d) Enacting regulatory frameworks that support the development of OER products and related services that align with national and international standards as well as the interest and values

of the OER stakeholders;

(f) Providing mechanisms for the implementation and application of OER, as well as encouraging the feedback from stakeholders and constant improvement of OER; and

(g) Optimizing existing education and research budgets and funds efficiently to source, develop and continuously improve OER models through inter-institutional, national, regional and international collaborations.

(v) Promoting and reinforcing international cooperation

To promote the development and use of OER, Member States should promote and reinforce international cooperation among all relevant stakeholders, whether on a bilateral or multilateral basis. Member States are encouraged to consider the following:

(a) Promoting and stimulating cross-border collaboration and alliances on OER projects and programmes, leveraging existing transnational, regional and global collaboration mechanisms and organizations. This should include joining efforts on collaborative development and use of OER as well as capacity building, repositories, communities of practice, joint research on OER and solidarity between all countries regardless of their state of OER development.

(c) Supporting the creation and maintenance of effective peer networks that share OER, based on areas such as subject matter, language, institutions, regions and level of education at local, regional and global levels.

(e) Exploring the development of an international framework for copyright exceptions and limitations for education and research purposes to facilitate cross-border exchange and cooperation on OER.

(f) Supporting the contribution of intercultural communication skills, the management of multicultural groups, the design of communities of practice and community adjustment strategies in the local implementation of OER to promote universal values.

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UNESCO Institute for Information Technologies in Education (UNESCO IITE)

UNESCO Institute for Information Technologies in Education (UNESCO IITE) was established as an integral part of UNESCO by the General Conference of UNESCO at its 29th session (November 1997) and is located in Moscow, Russian Federation. IITE is the only UNESCO category 1 Institute that holds a global mandate for ICT in education. In line with the new Education 2030 Agenda, IITE has developed its strategic priority areas to meet new demands and tasks ahead. The mission of IITE in the new era is promoting the innovative use of ICT and serving as facilitator and enabler for achieving Sustainable Development Goal 4 (SDG 4) through ICT-enabled solutions and best practices.

UNESCO International Research and Training Centre for Rural Education (UNESCO INRULED)

UNESCO International Research and Training Centre for Rural Education (UNESCO INRULED) was jointly founded by the Chinese government and UNESCO and located at BNU in 2008. The vision of UNESCO INRULED is to promote social-economic development in rural areas by bringing about positive changes in the thinking and behavior and rural people, who make the majority of the population in developing countries and to achieve the goals of Education for All. UNESCO INRULED has published over 40 publications, including research projects, training modules, magazines as well as newsletters. UNESCO INRULED also has established a wide network of cooperation with UN agencies, development agencies, non-governmental organizations, foundations and closed links with UNESCO institutions and centers.

Smart Learning Institute of Beijing Normal University (SLIBNU)

Beijing Normal University (BNU) grew out of the Education Department of Imperial University of Peking established in 1902, which initiated teacher training in China's higher education. After the development for over a century, BNU has become a comprehensive and research-intensive university with its main characteristics of basic disciplines in sciences and humanities, teacher education and educational science. Smart Learning Institute (SLI) is jointly established by Beijing Normal University and a global educational technology company NetDragon Websoft. SLI is a comprehensive experimental platform involving scientific research, technology development, and innovative instruction. SLI focuses on detecting learning patterns powered by ICT, creating smart learning environments and platforms for life-long and life-wide learning, as well as supporting diversified, personalized and differential learning needs for digital learners.

International association of smart learning environment (IASLE)

The International association of smart learning environments (IASLE) is a cutting-edge professional forum for researchers, academics, practitioners, and industry professionals interested and/or engaged in the reform of the ways of teaching and learning through advancing current learning environments towards smart learning environments. It provides opportunities for discussions and constructive dialogue among various stakeholders on the limitations of existing learning environments, need for reform, innovative uses of emerging pedagogical approaches and technologies, and sharing and promotion of best practices, leading to the evolution, design and implementation of smart learning environments.

Arab League's Educational, Cultural and Scientific Organization (ALECSO)

The Arab League Educational, Cultural and Scientific Organization (ALECSO) is a Tunis-based specialized institution working under the umbrella of the League of Arab States. It is essentially concerned with the development and coordination of the activities related to education, culture and sciences in the Arab World. It was established by virtue of Article 3 of the Arab Cultural Unity Charter, and was officially announced in Cairo on July 25, 1970.As stated in Article One of its Constitution, ALECSO was established with the aim of promoting Arab intellectual unity through education, culture and sciences, and enhancing the educational, cultural and scientific level in the Arab World so that it can positively contribute to universal civilization.

West University of Timişoara (WUT, www.uvt.ro)

West University of Timişoara (WUT, www.uvt.ro) is the main higher education institution and research pole in Western Romania. Its community comprises roughly 15000 students and 650 academic staff. It is a comprehensive university in character and includes 11 faculties with their respective departments, as well as a Department of Teacher Training. The university's strong focus on quality within an increasingly international and globalized academic world is endorsed by WUT's affiliation to various regional, European and international HE associations, as well as its position in world rankings. Our campus (located in the heart of the city) is in itself an attraction, with various opportunities for leisure and living in a city which was elected European Cultural Capital for 2021.

Universidad Internacional de La Rioja (UNIR)

Universidad Internacional de La Rioja (UNIR, www.unir.net, Spain) is a young 100% online university founded on a global vision of education directly linked to the market and the Society. UNIR facilitates an exclusive, innovative and high quality virtual model of higher education, which leans on a personalized, pro-active, and collaborative distance learning method of instruction. Furthermore, UNIR works hard to remove barriers, and to eliminate distance for learners with different profiles so that they can study at anytime and anywhere. UNIR provides international courses, in English and Spanish, and comprises an academic community of over 2.500 highly knowledgeable lecturers across the World, along with a strong team of more than 1.000 multidisciplinary staff members (including 200 tutors), working on research projects and support services (i.e. tutoring, legal, publishing, editing, technical, administrative, et cetera). UNIR has over 40.000 enrolled students in 2020, from over 100 countries and it has premises in Spain (La Rioja and Madrid), Ecuador (Quito), Colombia (Bogota), Argentina (Buenos Aires), Bolivia (Santa Cruz), Mexico DF (Mexico), Lima (Perú) and Miami (USA), along with a number of collaboration agreements with Latin American and European universities, mainly.

The Research Institute for Innovation & Technology in Education (UNIR iTED, http://ited.unir.net) has developed over 30 publicly funded projects, 4 European patents, 7 institutional chairs (with UNESCO, ICDE, IBM, Telefónica, etc.), 200 keynote speeches and 200 indexed scientific publications (including 20 books and special issues) focused on Learning Analytics, Open Education and Educational Technology.

Edmodo

Edmodo is an educational technology company offering a communication, collaboration, and coaching platform to K-12 schools and teachers. The Edmodo network enables teachers to share content, distribute quizzes, assignments, and manage communication with students, colleagues, and parents. Edmodo is very teacher-centric in their design and philosophy: students and parents can only join Edmodo if invited to do so by a teacher. Teachers and students spend large amounts of time on the platform, both in and out of the classroom. Edmodo is free to use, but it also offers premium services.

The Document Recommendation on Open Educational Resources, adopted by The General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) at its 40th Session, addresses FIVE Objectives:

- Building Capacity of Stakeholders to Create, Access, Re-use, Adapt and Redistribute OER
- Developing Supportive Policy
- Encouraging Inclusive and Equitable Quality OER
- Nurturing the Creation of Sustainability Models for OER
- Facilitating International Cooperation

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