

2. Technical and technological dimension

One key characteristic of Open Educational Resources (OER) is their digital nature, therefore technology is a fundamental element.

In this section, we will address the **technological basis for the creation, use and re-use of OER**:

- the **technical characteristics** of the software that supports open access to accessible and inclusive OER,
- the **platforms and repositories** for their storage and dissemination,
- their legal conditions of use related to their intellectual property **licences**.

	RECOMMENDATION	EXAMPLE
INDIVIDUALISED LEARNING	Critically consider if the technological tools and resources used in the OER facilitate the achievement of the learning objectives/outcomes.	
	Ensure that the technology tools and resources used in the OER support learner participation and active learning.	Use communication tools such as discussion forums, collaborative learning tools, self-assessment tools, etc.
	Consider if all your students have access to the technology required to use your OER.	When choosing your OER, consider whether a computer, internet access and/or a printer are available.
	Guarantee that students with special needs can also easily access the technologies required to use the OER.	Make sure a screen-reader software is available for visually impaired students, or provide an ergonomic computer mouse for students with limited mobility.
ADAPTABILITY	Ensure that you create OER that can be adapted to the different learning environments: in classrooms, on computers or other devices (tablets, electronic whiteboards, etc.), e-learning systems,	Provide the OER in an adaptable file format (e.g. word), an additional plain text file or the source code that facilitates its modification.

Recommendations

	RECOMMENDATION	EXAMPLE
	etc. Ensure that OER can be modified, updated and adapted by others according to their students' interests and needs.	
SECURITY	Develop the OER taking into account all possible electronic security measures to ensure the security, integrity and validity of the information.	Use password protection, encryption, secure platforms, or learning management systems, etc.
ASSISTANCE	Verify that links to or explanations of technical assistance are available in the OER.	Offer solutions to potential technical issues in OER and provide links to technical assistance if needed.
	Ensure that there are help functions that identify the most common user problems and their solutions.	Make certain that the user interface includes mechanisms (e.g., FAQs or help documentation) for users to troubleshoot any problems they may encounter while using the OER. Additionally, the help should be easy to locate, clearly outline the necessary steps, and not be overly extensive.
USABILITY	RECOMMENDATION	EXAMPLE
VISUAL DESIGN	Ensure that the visual design of the user interface is clear and coherent to facilitate learning and efficient mental processing. Avoid visual noise and unnecessary information overload.	Use short headings, legible font, left justification, balanced colours, etc. Avoid using distracting elements such as decorative figures, unnecessary icons, and irrelevant colours that do not contribute to the learning context.

Recommendations

USABILITY	RECOMMENDATION	EXAMPLE
	<p>Make the design of the OER intuitive.</p>	<p>Use a visual design that learners recognize and are familiar with. For instance, incorporating clear icons or images that convey their purpose unambiguously, such as using a trash can to represent the delete function.</p>
<p>CUSTOMISATION</p>	<p>Provide the user with the option to customise the interface, e.g. the background colour, to enhance the contrast, readability and usability.</p>	<p>Use dark colours for the text and light colours for the background. You can check the contrast of colours with tools such as Color Contrast Analyzer.</p>
<p>FONT</p>	<p>Verify that fonts are legible and visually appealing or give the user the possibility to customise the font type, colour and size.</p>	<p>For example Times New Roman, Georgia, Arial, Calibri, Verdana, Tahoma.</p> <p>The minimum font size is 10, although it is advisable to use 12 or 14 for students with visual or cognitive impairment.</p>
<p>FORMAT AND DESIGN</p>	<p>Verify that the design of the user interface should reflect the hierarchy of information.</p>	<p>Design the user interface elements (titles, buttons, links, menus, etc.) to allow the user to understand the information and guide him/her through the interaction with the OER.</p>
<p>NAVIGATION</p>	<p>Ensure that navigation is predictable and efficient.</p> <p>Verify that navigation is logical.</p>	<p>Use descriptive names for navigation elements. Employ a visual design for navigation elements that clearly distinguishes them from the rest of the user interface.</p> <p>Maintain a logical order for the navigation elements (links, navigation bars, menus, etc.) and keep them in the same positions. For example, navigation bars can be placed at</p>

Recommendations

USABILITY	RECOMMENDATION	EXAMPLE
		the top or bottom of the screen. Additionally, the number of items in a navigation menu should be between 6 to 8.
	Make certain that navigation guidance systems are integrated into the OER site so that learners know where they are in relation to the rest of the site.	Include breadcrumb trails, progress bars, educational paths, site map, etc. in the user interface.
	Confirm that undo navigation actions are available.	Provide the option to return to the previous page or to the home page from any page.
LICENCES	A licence defines what you and other teachers are allowed to do with the material. Licences specify whether materials can be reused, revised, remixed, or redistributed.	
	RECOMMENDATION	EXAMPLE
OER USE	Ensure that the OER is offered under an open licence, allowing free use or open code, and that its conditions of use are clearly specified within the OER.	<p>Look for a statement: check for a licencing statement in the material. It may be at the beginning, end, or in the metadata of digital files.</p> <p>Search for symbols or logos: look for Creative Commons logos (e.g., CC BY, CC BY-SA) or phrases like "licenced under..." followed by a licence type.</p> <p>Check the metadata: for online resources, check metadata (e.g., the file's "properties" or "info" tab) for licencing information. Some websites also specify licences in their footer, or download or privacy policy sections.</p>

Recommendations

LICENCES

A licence defines what you and other teachers are allowed to do with the material. Licences specify whether materials can be reused, revised, remixed, or redistributed.

OER DEVELOPMENT

Apply the licence by:

- clearly stating the licence on your material:
“[write here the name of your OER]” by [write here your name] is licensed under [licence name] via [link to the website].
- download the [licence logo](#) from this website and put it on the title page, the end of the footnote of your OER

Here is an example of how to put a CC-BY licence on your work:

“Recyclingkreislauf” by Jessica Berger is licensed under a [CC-BY 4.0 International](#) via [Flickr](#).

Verify that the creation and inclusion of various elements (texts, videos, audio files, and other materials) comply with the OER licence or other similar/compatible licences, such as Creative Commons or the public domain.

Make sure that all resources and materials used are appropriately cited and referenced.

Ensure that texts by other authors included in the resource are properly acknowledged with the correct author citation. Do not use copyrighted material and avoid plagiarism.

Include the authorship and licence of texts, images, videos, etc. in the caption.

Credit images, illustrations, videos, etc. by including the authorship and licence in the caption.

“[illustration name]” by [author name] is licensed under [licence name] via [website link].

Recommendations

DISTRIBUTION METADATA	<p>Platforms, so-called OER-repositories, are crucial for students and teachers to find and use your materials. Repositories might simplify the search for OER by search masks, filtering and tagging. You can help teachers locate OER that are accessible to all learners, including those with disabilities and those with diverse learning needs and preferences, with metadata that include accessibility criteria or customisable criteria. The term metadata refers to a collection of data that describes and conveys information about the purpose, content, and other aspects of OER.</p>	
	RECOMMENDATION	EXAMPLE
<p>METADATA ATTRIBUTION</p>	<p>Ensure that a wide audience can find the OER by having appropriate and relevant metadata associated with them.</p>	<p>Use meaningful and clear information to facilitate its subsequent localisation. For example:</p> <ol style="list-style-type: none"> 1. Basic Information (title, author, description, language, date of creation) 2. Educational Information (subject, educational level, learning objectives) 3. Licencing Information 4. Technical Information (file format and size) 5. Keywords/Tags 6. Usage Information (accessibility features)
<p>ADAPTED VERSIONS</p>	<p>Make certain that there are clear procedures/processes in place for end-users to submit revised or adapted versions of downloaded OER.</p>	<p>Offer options for uploading revised or modified versions of OER. For example, you can use the eXeLearning authoring tool.</p>