

4. Accessibility

4.1. Technological Accessibility

This chapter includes guidelines for the creation of accessible multimedia: text, pictures, audiovisual media, video games, websites and web-based applications based on the [Web Content Accessibility Guidelines](#) (WCAG). For a detailed list, please refer to the [EQui-T Comprehensive Framework](#)

TEXT	RECOMMENDATION	EXAMPLE
	<p>For students who might need it, provide different versions of the document, adjusting spaces between letters, words, and lines.</p>	<p>You can enlarge the space between letters, e.g., in Word, by clicking on “font”, “advanced” and then “spacing”. Here, you can find further information. You can also use the immersive reader.</p>
	<p>Provide a way for identifying specific definitions of words, phrases or abbreviations that are new to students or used in an unusual way (e.g., idioms and jargon).</p>	<p>If needed, add a section with a dictionary of terms, or include the definition of a word close to it (in the same line, underneath it, in parentheses or as a pop-up) the first time it appears.</p>
	<p>Note that the structure, such as the reading order, and interactive elements can be clearly recognised and displayed by assistive technologies.</p>	<p>The labels for each checkbox must be identifiable by assistive technology, for example, by a screen reader.</p>

Recommendations

TEXT	RECOMMENDATION	EXAMPLE
	<p>Ensure that information is conveyed in multiple ways, such as using text labels, patterns, auditory cues, colours, shape, size, visual location or orientation.</p>	<p>Instead of using only a red colour to indicate that certain fields in a form are mandatory, also use an asterisk to mark them.</p>
	<p>Make sure that the content is easily readable in both landscape and portrait display orientations, unless a specific orientation is essential.</p>	
	<p>Maintain consistency between icons and text with the same purpose throughout the OER.</p>	
	<p>When creating a list, use the corresponding function.</p>	<p>Use the list function instead of adding symbols or characters, since screen-readers, for example, might not recognise it as a list.</p>
	<p>Ensure that text can be resized without assistive technology up to 200 percent, without loss of content or functionality.</p>	<p>For example, text can be enlarged by using Control+ in the browser or by changing its size in the settings of the device used to run the application.</p>
	<p>To ensure that the language of the content can be identified by assistive technology, indicate the language at the beginning and when it changes, so the screen reader can read it properly.</p>	

Recommendations

IMAGES, TABLES & GRAPHS	RECOMMENDATION	EXAMPLE
	<p>Use clear and easy-to-understand images with appropriate quality, size, resolution (number of pixels), brightness, and so on. Avoid blurry images.</p>	<p>If the text explains the water cycle, include a clear diagram showing evaporation, condensation, precipitation, and collection, with labelled arrows and simple visuals to aid understanding.</p>
	<p>Describe all images with alternative text so that they can be read by a screen reader. The alternative text can be added, for example, by right-clicking on the object and “Edit Alt Text”. Further details can be found here.</p>	<p>An alternative text for the above image could be: ‘Water cycle depiction’.</p>
	<p>Ensure that there is sufficient contrast between the background and the foreground in the used images.</p>	<p>If there is a background of sky and mountains behind the cow and grass, it should be clearly distinguishable.</p>
	<p>Do not include text in images.</p>	<p>Instead of adding text inside the image, write it down as a title or in a separate paragraph.</p>
	<p>When using tables, make sure that they are well-structured and clearly described</p>	<p>Include a header row and keep them simple by avoiding as far as possible empty, combined, divided or nested cells.</p>
	<p>Where appropriate, use alternative means (e.g. pattern) rather than colour to differentiate content and functionality.</p>	<p>When presenting graphs, instead of using colours like green and red, use dots and stripes to distinguish them, to provide clarity also for students with colour blindness.</p>
	<p>Avoid adding tables in the form of an image/screenshot, but create the table directly in the document.</p>	

Recommendations

AUDIO	RECOMMENDATION	EXAMPLE
	<p>Make sure that the sound is high-quality in terms of pitch, duration, intensity and tone. If there is the need to, adapt the audio by e.g. reducing background noise</p>	<p>You can adapt audio for example by using the software Audacity.</p>
	<p>Avoid background audio or lower it.</p>	<p>There is no background music when someone is talking.</p>
	<p>Verify that the voice in the audio is slow and not too soft or loud.</p>	
	<p>If you record an audio track yourself, ensure that the voice in the audio has good pronunciation and vocalises well. Allow room for pauses, when necessary. Leave your audience enough time to understand the information before providing new information.</p>	
	<p>Provide tools to pause or stop the audio, which are easy to find and use. If it is possible, include separate volume controls or mutes for effects, speech and background/music.</p>	<p>Make sure there are buttons to stop, pause, change the volume, etc.</p>
	<p>If you have students with hearing impairment, include a textual transcription of the audio. See dimension 5.3 (subtitling and audio description). Also, make sure that the students have control over the textual alternatives.</p>	<p>This transcription can be useful for learners who cannot listen to the audio, and can also be translated to other languages or even printed in Braille. Make sure there are buttons to show/hide textual alternatives.</p>

Recommendations

VIDEO	RECOMMENDATION	EXAMPLE
	Ensure that the video and sound are clear and of high quality.	
	Provide synchronized alternatives for the video.	Use subtitling, audio description, full transcription or sign language (SL).
	Provide textual description and transcription of the video.	
	Ensure that students have control over the management of the video reproduction and its alternatives.	There are buttons to stop, pause, move forward and backward the video. There are buttons to show the alternatives.
	Ensure that there is sufficient contrast between the background and foreground of the video.	
	Avoid slow and fast motion.	

WEBSITES, APPS	RECOMMENDATION	EXAMPLE
	Avoid designing content in a manner that is known to trigger seizures or physical reactions.	Refrain from using flashing elements.
	Maintain coherence in the appearance (form, size, colour, location, etc.) of the elements that have the same functionality (links, icons, buttons, etc.) throughout the website, the application or document.	For example, if the icon to search is a magnifying glass, it should be the same throughout the OER.

Recommendations

WEBSITES, APPS	RECOMMENDATION	EXAMPLE
	<p>Make interactive elements, such as hyperlinks, buttons, lists, menus, and dialogue boxes, stand out visually. In the case of hyperlinks, clarify where they lead to.</p>	<p>Underline the text of the hyperlinks, place it in a box.</p>
	<p>Make sure that interactive elements and virtual controls are large and well-spaced, particularly on small or touch screens or can be adjusted in size to improve learners’ interaction.</p>	<p>The size of a button on a mobile phone screen should be at least 9mm.</p>
	<p>Provide options to pause, stop, or hide any moving, blinking, auto-updating, or scrolling information where possible when it meets any of the following criteria: (1) it starts automatically, (2) it lasts longer than five seconds, or (3) it is displayed simultaneously with other content.</p>	<p>If a page includes an auto-playing video with sound, provide clear controls to pause, stop, or mute the video. For instance, a video demonstrating a science experiment should allow learners to start it manually and adjust settings as needed.</p>
	<p>Guarantee that all content and functionality with different controls are available using assistive technologies such as screen readers.</p>	
	<p>Confirm that the elements of the learning environment (i.e., buttons) change their state and position only when necessary, as this helps prevent confusion.</p>	<p>For students with different impairments, it is easier to find the “return”-button if it is always placed in the left bottom corner.</p>
	<p>Provide students with opportunities to track their progress, for example, by indicating which parts have been successfully completed.</p>	<p>A scoring system with stars or a progress bar in each exercise can help students understand the level of completion of a session.</p>
	<p>Provide students with the possibility to save their progress so they can continue working at a later time.</p>	<p>Use programs that enable pausing, automatically or manually save the work in progress, avoiding the need for learners to re-enter all information.</p>

Recommendations

WEBSITES, APPS	RECOMMENDATION	EXAMPLE
	<p>Include a mechanism for reviewing, confirming, and correcting information before learners finalise data submission.</p>	<p>For example, before submitting the answers, the application should ask the student for confirmation.</p>
	<p>Ensure that each section or screen of the website or application includes a clear and meaningful title or heading, and that the order is intuitive, guiding the student through the OER step-by-step.</p>	<p>For example, in a form, the fields should be arranged in the order they are meant to be completed.</p>
	<p>Ensure that every digital educational material’s functionality is easy to handle through standard input devices (keyboard, mouse) and also through non-standard ones using additional assistive technology (buttons, emulators, etc).</p>	
	<p>Reduce accidental activation of controls.</p>	<p>For example, for interface elements that respond to a single tap or long press, the corresponding event is triggered when the finger is lifted while still within that element.</p>
	<p>Make sure that forms are easy to fill out and provide tools to assist learners in completing them, along with options to prevent and/or correct any errors during the process.</p>	<p>Word predictors, along with the use of lists and checklists with default values, reduce the need for typing and, consequently, minimize errors.</p>
	<p>Provide officially supported assistive technologies, which are already fully accessible. Ensure that any third-party tools used are accessible.</p>	<p>e.g. software (eye-tracking)</p>
	<p>Ensure that the name, role, states, properties and values of all user interface components (buttons, menus, form fields, links, components generated by scripts, etc.) can be programmatically set</p>	<p>A button to start an exercise should be labelled “start” and its internal name should also be “start”, not “button1”.</p>

Recommendations

WEBSITES, APPS	RECOMMENDATION	EXAMPLE
	and that the notification of changes to these items is available to assistive technologies.	
EDUCATIONAL GAMES	RECOMMENDATION	EXAMPLE
	Check that the game is accessible for all students in your class.	If you use https://genially.com to create a game, then you can use all the accessible settings offered.
	Check that the game is easy to learn but challenging to master.	Several difficulty levels can be provided.
	Ensure that the game does not put an unnecessary burden on the player.	The game is adapted to the cognitive level or the motor skills of the learner.
	Make sure that the players feel that their actions are meaningful. The actions must have a direct effect on and provide immediate feedback so that the players have a sense of control and influence on the game world.	The game only continues when the player presses a button, in order to activate the game, start a chapter, sound starts playing, etc.
	Check that game controls are consistent, intuitive and naturally mapped (i.e., controlled through the most conventional game keys).	The right arrow button or key moves the character to the right.
	Offer a tutorial to introduce all general controls necessary to make progress in the game through a series of small tasks.	Before entering the first chapter, the player can learn how to move in the game world step by step.

Recommendations

EDUCATIONAL GAMES	RECOMMENDATION	EXAMPLE
	Check that the challenges in the game are in order so that players apply the knowledge acquired in previous problems to solve the next ones.	First show how you can make a character jump, before putting it in a situation where it has to jump.
	Provide information such as descriptions of situations or clues “On Demand” and “Just in Time”.	Do not reveal what is going to happen unless the player asks for it or is in a scene that requires instructions.
	Make sure that the goal(s) of the game can be clearly understood by all students, with and without disabilities.	Scores can be displayed as a number, with one or more stars, or with a progress bar.
	Use stereo, binaural or surround sound for the localisation of game objects for players with visual impairments. Select distinctive sound and music for all interactive objects and events.	Stereo audio provides a sense of directionality, binaural audio goes deeper into replicating perception, and immersive audio surrounds the listener with a three-dimensional sound environment. Each character can have a distinctive sound when you touch or move it.
	Ensure that the game story encourages immersion and identification if the game has a story component.	The background can be somewhere known or meaningful. Avatars can be used for the players to associate/identify them with.