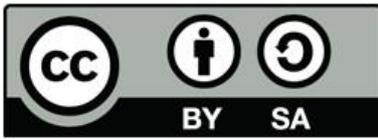


GUIDELINES FOR ACCESSIBLE INFORMATION

**ICT FOR INFORMATION ACCESSIBILITY
IN LEARNING (ICT4IAL)**



European Agency for Special Needs and Inclusive Education, 2015

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The ICT for Information Accessibility in Learning project is a multi-disciplinary network of the following European and international partners, representing learning and ICT communities



[DAISY Consortium](#)



[European Agency for Special Needs and Inclusive Education](#)



[European Schoolnet](#)



[Global Initiative for Inclusive ICTs](#)



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PREAMBLE

The Guidelines for accessible information are an [open educational resource](#) (OER) to support the creation of accessible information in general and for learning in particular. These Guidelines do not aim to contain all available information on accessibility or cover every aspect of the field, but to summarise and link to existing and useful resources which can be helpful for non-[information and communications technologies](#) (ICT) experts.

The purpose of developing such Guidelines is to support the work of practitioners and organisations working in the field of education to provide accessible information to all learners who require and will benefit from more accessible information. The procedure for creating accessible information is universal. Therefore, these Guidelines support all individuals or organisations wishing to create information that is accessible in different formats.

The justifications for the development of such Guidelines are very clear in both European and international policy, which highlight access to information as a human right. The [ICT4IAL website](#) includes a summary of these key policies.

Within the Guidelines you will find:

- a general introduction, description of the main terms, the target group and scope of the Guidelines;
- steps to make information and media accessible, including recommendations and relevant resources;
- examples of accessibility checklists for specific formats; and
- an extensive [glossary](#) providing working definitions of relevant terms.

The Guidelines include two steps for action that build upon each other. By following the Guidelines in Step 1 to make different types of information accessible, Step 2 becomes easier, as already accessible information is available to be used within the different media.

The Guidelines give guidance on actions to be taken and resources are provided which give more in-depth information.

The Guidelines have been developed as an OER and are intended to be adapted to varying contexts and technological developments, as well as to grow with usage.

Throughout all sections of the Guidelines, you will find links either to an explanation of a key term within the glossary or to external resources.

These Guidelines were developed through the [ICT for Information Accessibility in Learning](#) (ICT4IAL) project, which was co-funded by the [Lifelong Learning Programme](#) of the [European Commission](#).

INTRODUCTION AND RATIONALE FOR THE GUIDELINES

During this time of technical innovation, every person can potentially become an author of information that is used for learning, but not everyone needs to be an expert in making information accessible. However, it is important for everyone to be aware that [information](#) may not be accessible to different users depending on the way it is presented.

Currently the World Health Organization (WHO) states:

- Over a billion people, about 15% of the world’s population, have some form of disability.
- Between 110 million and 190 million adults have significant difficulties in functioning.
- Rates of disability are increasing due to population ageing and increases in chronic health conditions, among other causes ([WHO, 2014](#)).

Some 15% of the world’s population cannot access information, unless it is made accessible.

Within the Guidelines, the term ‘[learners with disabilities and/or special needs](#)’ is used to refer to the potential target group of people who can benefit from more accessible [information](#) provision. This phrasing respects the terminology of both the [United Nations Convention on the Rights of Persons with Disabilities](#) – UNCRPD (2006) and agreements reached with the [ICT4IAL project partners](#), as the term ‘special needs’ often covers a broader range of learners with additional needs than those identified as having disabilities as defined under the UNCRPD.

It is now technologically possible for many people to create and share information. In addition, there are numerous resources for these authors to learn how to create documents that do not exclude anyone from accessing and using them. This does not require every author of information to become an expert in information accessibility for all forms of disabilities and/or special needs, but it does mean that all authors should aim to achieve a minimum standard of information accessibility that is universally beneficial for all users.

It is crucial to provide information in general – and information for learning in particular – in a way that is accessible to all users. Providing information that is not accessible [creates an additional barrier](#) for learners with disabilities and/or special needs. Information that is not accessible does not support people in the best way possible and excludes them from benefiting from and participating in knowledge exchange.

With this rationale in mind, the [ICT for Information Accessibility in Learning project](#) developed a set of Guidelines to support practitioners in creating accessible material.

As an [open educational resource](#) (OER) – which permits free use and re-purposing by others – these Guidelines aim to provide easy and practical instructions for authors to create [accessible information](#) that can be shared through accessible [media](#). The Guidelines can be applied to all types of information produced, but will be especially beneficial to learners with disabilities and/or special needs when applied to information for learning.

However, accessibility of information is not only beneficial for learners with disabilities and/or special needs, but has the potential to benefit all learners. Therefore the Guidelines also take an inclusive approach and do not focus on single disabilities.

What is meant by ‘accessible information’?

Within the Guidelines ‘[accessibility](#)’ is understood as described in [Article 9](#) of the United Nations Convention on the Rights of Persons with Disabilities as:

... appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including [information and communications technologies](#) and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas ([United Nations, 2006, p. 8](#)).

This is a wider concept covering many environmental and physical factors. The Guidelines focus on one area within this definition – the accessibility of information.

Within the Guidelines, [information](#) is understood to refer to a message or data that is communicated concerning a specific issue. Specifically, these Guidelines focus on the aim of sharing messages to inform learners and build knowledge in a learning environment.

Within the Guidelines the different types of information considered are text, image, audio and video. These types of information can be shared or delivered through different media channels, such as [electronic](#) documents, online resources, videos and printed material.

These media channels usually contain different types of information simultaneously.

In relation to media channels, the Guidelines consider how information is converted or packaged into a certain [format](#) using (for example) text-editing programmes – and delivered or presented to the user.

In education, the types of materials this applies to include (but are not limited to):

- Learning materials
- Course content
- Course descriptions

- Registration information and registration systems
- Research material
- University and library websites
- Catalogues and repositories
- [e-learning](#) software and learning platforms.

[Accessible information](#) is understood as information provided in formats that allow every user and learner to access content 'on an equal basis with others' ([UNCRPD](#)). Accessible information is ideally information that:

- allows all users and learners to easily orientate themselves within the content; and
- can be effectively perceived and understood by different perception channels, such as using eyes and/or ears and/or fingers.

Accessibility is not the same as [usability](#). Accessibility is about ensuring people with disabilities and/or special needs have access on an equal basis as everyone else. [Usability](#) is about creating an effective, efficient and satisfactory user experience.

Full 100% accessibility of information for every user or learner is an ideal that is not easy to achieve. However, [technology](#) allows us to create and share information in a way in which the content is adaptable by the user, which means users may change the content according to their needs.

Numerous additional terms related to accessibility appear throughout this resource. All relevant terms are defined in the [glossary](#).

Who are these Guidelines for?

The intended audience for these Guidelines is any individual or organisation that creates, publishes, distributes and/or uses information within a learning environment. This includes, but is not limited to, [information providers](#) such as:

- School staff
- Librarians
- University staff
- Communication officers
- Publishers
- Support groups and non-governmental organisations.

It is important to note that, although an individual author or information provider can initiate many actions to improve accessibility, providing accessible information in general and for learning in particular may require the involvement of a wider group of stakeholders, for example:

- Decision makers in schools and universities who support accessible approaches and have agreed policies on accessibility;
- Computer scientists and information technology (IT) experts responsible for establishing accessible internet platforms, tools, sites and repositories where accessible information can be shared.

The Guidelines focus on possibilities for non-expert practitioners to create accessible information within their working environments. Recommendations for organisations on how to support accessible information provision at an organisational level have been developed in the [Accessible Information Provision for Lifelong Learning](#) project.

What support is provided through the Guidelines?

The Guidelines aim to be content and context free, but offer some concrete examples of how they can be applied to different learning situations.

The Guidelines consider different levels of information accessibility, ranging from easy instructions to professional instructions, and include some aspects for ICT and accessibility experts. There are many steps an average IT user can take to achieve a certain degree of accessibility. However, the creation of some materials – such as e-books and interactive learning materials – requires more sophisticated software than the average user may have access to. These Guidelines focus on the steps every practitioner can take to make the learning information they produce as accessible as possible.

These [Guidelines](#) are available as a stand-alone document, as well as an [OER](#) that supports searching across different types of information and media. The Guidelines as OER are open for users to adapt to their context, as well as to comment on and contribute to.

The Guidelines build on a set of premises:

- The general steps to achieve accessible information are universal. Therefore the Guidelines apply to information in general and to information for learning in particular.
- The Guidelines take an inclusive approach and do not focus on particular disabilities or special educational needs.
- The challenges regarding the accessibility of content vary hugely according to the structural complexity of the content. For example, a typical bestseller book is structurally less complex than educational/scientific material.
- The accessibility of learning materials has specific challenges, for example interactivity between the learner and the content, filling in forms or usage of formulas for which technology does not yet offer easy solutions for non-ICT experts.
- In some cases, providing accessible information is not enough. Many users and learners with disabilities and/or special needs also require

access to [assistive technologies](#). The use of assistive devices is not made redundant by the provision of accessible information, but complements it.

- Providers of information in general and information for learning in particular do not have to be accessibility experts in order to achieve a basic level of information accessibility.
- The Guidelines do not encompass every step in the production of accessible information, nor do they replace existing resources. The Guidelines are a carefully considered and validated starting point for producing accessible information that leads to more detailed resources including descriptions, tutorials, recommendations or standards.
- The Guidelines are not a static resource, but are intended to be adapted to varying contexts, technological developments and to grow with usage (for example, adaptations could be made for texts with a right-to-left reading direction).
- The Guidelines can support the creation of new, accessible content, as well as support the review of existing material.
- Currently technology is in a transition phase regarding the production, distribution and reading of accessible information. Software allows users to create most material in an accessible format. However, in newer technologies, such as e-books, games and mobile applications, software for average users to create this is not always available. Therefore there are currently limits to what the average user can create with accessibility in mind.
- Given the limits of producing accessible information with average software, there are actions which can be outsourced to third parties, such as IT specialists or web developers. These Guidelines can support requirements to be mentioned as criteria in the procurement process.

These Guidelines build on two steps for action:

Step 1 describes how to create accessible information via text, images, and audio.

Step 2 considers how media can be made accessible – for example, electronic documents, online sources or printed material.

These two steps build upon each other. By following the Guidelines in Step 1 to make different types of information accessible, Step 2 becomes easier as already accessible information is available to be used within the different media.

For each step, the Guidelines provide recommendations on how different types of information can be made accessible. Each recommendation is accompanied by a list of resources available to support this process. The resources listed in the following sections are categorised into:

- ‘easy’: actions which can be completed with a general knowledge of common software programmes;
- ‘advanced’: actions which can be completed with an in-depth knowledge of common software programmes; and
- ‘professional’ levels: actions which can be completed with a more professional knowledge of software and general knowledge of programming.

Unless otherwise specified, the online resources linked to in the Guidelines are in English. Applying the Guidelines by making use of the recommendations and resources will lead to more accessible information for learning.

STEP 1: MAKING DIFFERENT TYPES OF INFORMATION ACCESSIBLE

Section 1: Making your text accessible

One of the most important issues in making text accessible is its structure and the ability to navigate it (navigability).

'Text structure' usually refers to whether the paragraphs are in the right order for the user to follow, making it easier to read. When it comes to text [accessibility](#), [structure](#) has a slightly different meaning: it refers to what makes it easy to navigate around that text. Each chapter heading and any sub-headings are set out in the table of contents, just as they are in this document. In an exam paper it could refer to the individual questions. Each element that is important – for example, chapter heading, table, figure, exam question – may be given certain attributes and labelled.

Once structure is applied, a document's accessibility is enhanced in two ways. First, it makes it easier for any user, including those using assistive technologies, to find their way around it. Second, it allows a different user to transfer the text to a different [format](#) more easily.

Structuring textual information (a text) is essential in order to make it accessible to all users. Textual information is structured by logically labelling different elements within it, such as sequential use of headers, captions and tables. A properly structured document can be easily converted to the format that is preferred by the user; for example, a well-structured text document can be read out loud and navigated by [screen readers](#) or other [assistive technologies](#), maintaining the logical order embedded in the text.

The more complex the visual layout (tables, footnotes, boxes, icons, etc.), the more important it is to indicate the logical reading order within the structure.

With very complex texts, it is important to know who the target audience is and structure it accordingly. In many instances a more simplified version of the text may be more useful to a wider range of users.

It is particularly challenging to make interactive features within text-based learning material accessible.

1.1 How to make your textual information accessible

- Use the simplest language that is appropriate for your document.
- Use a point size of minimum 12.
- Use a sans-serif [font](#) such as Arial, Helvetica or Verdana.
- For online texts, use the fonts Verdana, Tahoma and Trebuchet MS, which are specially designed for reading on a screen.
- Allow the user to change font and point size as needed in online texts.

- Left align text instead of using block text (full justification).
- Provide the full name the first time you use abbreviations and acronyms.
- Provide a text structure by using pre-defined headings ('styles') and body text offered by the used software. These headings should follow a logical order.
- Use headers only where they define structure, not for font effects that should highlight content.
- Use 'Bullets and Numbering' functions for lists.
- State the primary natural language of your document in the metadata for the document. Mark changes to another language in the text.
- Identify and provide keywords for your text.
- Add short summaries of content or chapter where possible.
- Make navigation in online texts possible with keyboard only or keyboard shortcuts.
- Ensure that colours and the use of bold and italics are not your only method of conveying meaning.
- Ensure that text and background colour combinations provide a very good contrast.
- Ensure that your text and graphics are easily understandable when viewed without colour. Ensure that all [information](#) conveyed with colour is also available without colour. Do not rely on colour alone to highlight different content.
- Provide non-text equivalents (e.g. pictures, videos, and pre-recorded audio) of your text. This is beneficial to some users, especially non-readers or people who have difficulty reading.
- Footnotes and links that are particularly relevant to complete/clarify the information in the main elements of the text structure should be numbered and the numbers should be specifically associated with these main elements.
- Give data tables row and column headers and describe their content in a summary.
- Make sure that the layout supports the reading direction which makes sense in relation to the content (left-to-right or right-to-left, depending on the language used).
- Make sure that each link and element has a unique and well-described label.
- Give form fields a label.
- Make navigation in online texts possible with keyboard only or keyboard shortcuts.

1.2 Resources to help make your textual information accessible

Easy instructions

- [Load2Learn video tutorials](#): creating structured documents and accessible portable document format (PDFs) in Microsoft Word
- Books for All – [Accessible Text: Guidelines for Good Practice](#): A teacher’s guide to creating accessible learning materials
- [Inclusive Learning Design Handbook – Introduction](#): resource to assist teachers, content creators, web developers, and others in creating adaptable and personalisable educational resources
- [Accessible Digital Office Document Project](#): accessibility in word processing, spreadsheet, presentation, PDF and e-book applications

Advanced instructions

- [Understanding content structure](#): W3C guideline on creating content that can be presented in different ways without losing information or structure
- [Use of colour](#): W3C guideline on making content distinguishable
- [Inclusive Learning Design Handbook – Inclusive EPUB 3](#): resource for content creators and educators who wish to use [EPUB 3](#)
- [National Center for Accessible Media](#): resources for creating accessible educational, TV, web and multimedia materials
- [DIAGRAM Center](#): creating and using accessible [digital](#) images

Professional instructions

- [Creating adaptable text structure](#): creating content that can be presented in different ways without losing information or structure
- [Separating information and structure from presentation](#) to enable different presentations
- [Aligning text to one side](#) on web pages
- [Allow navigation with keyboard shortcuts](#) to allow content to be operated through a keyboard or keyboard interface

Section 2: Making your images accessible

Images can help to convey meaning. In order for images to be useful for all, the visual input must also be presented using an additional description of the [information](#). Images could be photographs, drawings or diagrams.

The main task for making images accessible is to give them alternative text.

2.1 How to make your image-based information accessible

- Avoid adding images that do not provide any additional, meaningful or valuable information.
- Avoid using images to represent text.
- Give your images alternative text – a description that shares the same message as the visual image. State what is being portrayed and avoid descriptions such as ‘image of’ in the alternative text.
- Provide alternative text for every non-text element.
- Avoid use of red, green and yellow, and lighter greys.
- Use sufficient contrast of colours between text and background.
- Avoid unnecessary backgrounds with too many images, shapes or colours.
- Avoid hyperlinks or text being hidden behind other objects such as images.
- Allow the size of online images to be [scalable](#) as needed.

2.2 Resources to help make your image-based information accessible

Easy instructions

- WebAIM [accessible images](#): accessibility principles and techniques for images

Advanced instructions

- WebAIM [alternative text](#) for web images
- Making [complex or dynamic images](#) representing processes accessible

Section 3: Making your audio accessible

An audio version of [information](#) can be beneficial for a larger group of users, who cannot access information which is purely shared through visual channels. In order for audio to be accessible to all, it needs to be shared in combination with another type of information, such as text, or replaced by a sign language video.

3.1 How to make your audio information accessible

- Give your audio a text equivalent. This is text which shares the same information as the video, without important content being lost. Transcripts and captions are examples of a text equivalent.
- If possible, provide the option of word highlight in the text equivalent.
- Provide volume controls.
- Provide visual equivalents to audio alerts.
- Provide alternatives for audio [media](#).
- Avoid automatic playing of audio or video.
- Provide keyboard-accessible fast forward, rewind and pause functions.
- Give the user the possibility of inserting bookmarks.

3.2 Resources to help make your audio information accessible

Advanced instructions

- IMS Global Learning Consortium: [Guidelines for Accessible Delivery of Text, Audio, Images and Multimedia](#) for learning
- International Standard – [ISO/IEC 40500:2012 – Information technology – W3C Web Content Accessibility Guidelines \(WCAG\) 2.0 – Abstract](#): recommendations for making web content more accessible
- [Web Content Accessibility Guidelines \(WCAG\) 2.0 – W3C Recommendation 11 December 2008](#): providing alternatives for audio media
- [How to Meet WCAG 2.0](#): quick reference to [WCAG](#) 2.0 requirements and techniques
- [Understanding WCAG 2.0](#): detailed technical description of the WCAG 2.0 guidelines and their Success Criteria
- DAISY Consortium: [creating navigable audio books](#)

Professional instructions

- W3C: [Provide equivalent alternatives to auditory and visual content](#)
- W3C: [Examples of text equivalent given for non-text information](#)

- W3C: [Success Criteria For Providing Alternatives For Audio](#)
- W3C: [Provide alternatives for time-based media](#)

Section 4: Making your video accessible

Users who cannot access visual media channels need an audio description of what can be seen. Users who cannot access audio media channels need [closed captions](#) about the dialogues and all important audio [information](#). Users who do not understand the language being used in the video need [subtitles](#) of the dialogue. Scripts about the video are required for users who cannot access visual or audio media channels.

4.1 How to make your video media accessible

- Give video either a text equivalent or captions. Aim not only to provide captions of the words spoken, but also a brief description of what is taking place.
- Ensure the text equivalent/script or captions are synchronised with the video. Captions are an alternative way of showing what people can hear. Scripts contain all the information that the video gives.
- Ensure the user can control the video: adjust volume, pause the video. Provide fast forward, rewind and pause functions.
- Ensure the video can be played in different [media](#) players.
- Ensure the video can be downloaded.
- Provide alternatives for video.
- Avoid automatic playing of video.

4.2 Resources to help make your video media accessible

Easy instructions

- Introduction to [captions, transcripts and audio descriptions](#)

Advanced instructions

- [Guidelines on accessible video applications](#)
- AccessGA [captioning](#): principles, techniques, resources and recommendations
- [W3C: Providing closed captioning](#)

Professional instructions

- [OFCOM / ITC Guidance on Standards for Audio Description](#)
- [YouTube video accessibility](#): embedding an accessible YouTube video and YouTube player on a website

STEP 2: MAKING THE DELIVERY OF MEDIA ACCESSIBLE

Increasingly, [information](#) that is shared contains all of the information types mentioned in step 1: text, image, audio and video. Information is delivered as a mix of types within [electronic](#) documents, online-based resources or printed material.

If the various types of information are made accessible according to the Guidelines in Step 1, it is easier to create [media](#) – for example, websites – that are accessible. Therefore, the [accessibility](#) of the types of information is considered a prerequisite for delivering [accessible information](#) and is not repeated below. It is assumed that Step 1 has been addressed.

Section 1: Making your electronic documents accessible

The electronic document is one of the most common mixtures of the types of information. Electronic documents allow authors to embed pictures, tables and videos, for example.

Information in electronic documents can be delivered in text documents – such as Microsoft Word, Adobe PDF, presentations or slideshows – or in audio [format](#) – such as MP3 or analogue tape. While the steps to achieve full accessibility may vary depending on the approach used, the ease with which these electronic documents can be made accessible grows with the inclusion of accessible types of information.

It is important to note that many authoring tools now offer accessibility features and checking tools to ensure documents are created in an accessible format.

An accessible PDF, for example, often begins its life as an accessible text document. Most accessibility features are transferred into different formats. However, depending on software versions, it is still possible that individual accessibility features may not transfer across.

In the future, enhanced e-books will considerably improve access to all kinds of content in special standards such as [EPUB 3](#) and, more specifically, [EDUPUB](#). E-books present new challenges with regard to accessibility as they can include interactive functionalities, animations and other advanced features.

1.1 How to make your electronic documents accessible

- Specify the language of your document.
- [Tag](#) your document to give it [structure](#), using the function in the software you are using.
- Use the accessibility checker offered by your software as a simple check before sharing the document.

- Use the most up-to-date versions of software to create a PDF. Newer software versions include more up-to-date accessibility features. However, make sure that your electronic document is also usable in older versions.
- Fill in the [metadata](#) information to help users find the information through internet searches. Minimum information to be included are the document title and the main natural language of the document.
- Include all relevant elements in your document structure.
- Avoid horizontal scrolling (scrolling from left to right or vice versa).
- Provide descriptions for form fields.

1.2 Resources to help make your electronic documents accessible

Easy instructions

- Introduction to [Accessible Instructional Materials](#) for educators, producers and users
- Books for All – [Accessible Text: Guidelines for Good Practice](#): teacher’s guide to creating accessible learning materials
- [Inclusive Learning Design Handbook](#): resource to assist teachers, content creators, Web developers, and others in creating adaptable and personalisable educational resources
- [Tingtun PDF accessibility checker](#): upload or link to a PDF to check its accessibility
- [WebAIM PDF accessibility](#): introduction to and instructions for accessible PDFs
- CATEA [guidelines on accessible PDF documents](#)
- Load2Learn video on [how to create accessible PDFs from Microsoft Word 2007 and 2010](#)
- [Load2Learn video tutorials](#): accessible documents, structured documents, audiobooks, text-to-speech, e-books, productivity and accessibility
- WebAIM [guidance on accessible Microsoft Word documents](#)
- CATEA [guidelines on accessible Word documents](#)
- CATEA [guidelines on accessible Excel documents](#)
- WebAIM guidance on [PowerPoint accessibility](#)
- CATEA [guidelines on accessible PowerPoint files](#)

Advanced instructions

- Adobe Acrobat X accessibility [support for creating accessible PDF forms](#)

- [PDF Accessibility Checker \(PAC2\)](#) based on the [Matterhorn Protocol](#)
- WebAIM [guidance on creating accessible forms](#)
- WebAIM [guidance on creating accessible tables](#)
- Load2Learn video on [creating a DAISY book from Word](#)
- [Accessible EPUB 3](#) by Matt Garrish: free e-book from O'Reilly
- [DAISYpedia](#): information resource to assist in and support the implementation of the DAISY standards
- [Contrast-A contrast checker](#) for finding accessible colour combinations

Professional instructions

- WebAIM [guidance on creating accessible frames](#)
- [EPUB accessibility forum](#) at idpf.org: global trade and standards organisation dedicated to the development and promotion of electronic publishing and content consumption
- DIAGRAM Center [Top Tips for Creating Accessible EPUB 3 Files](#)

Section 2: Making your online resources accessible

Online resources, such as web pages, databases and online platforms, are also likely to include all types of [information](#) – text, images, audio and video. There are many resources to help making online resources accessible and there are international standards which are widely recognised and adopted.

When creating online resources, the most important step towards [accessibility](#) is to meet the [Web Content Accessibility Guidelines \(WCAG 2.0\)](#). These are guidelines for advanced users.

[Information providers](#) are likely to outsource the development of online resources. In this case, the items below can act as a list of criteria for procurement and the selection of contractors.

2.1 How to make your online resources accessible

- Provide [metadata](#). Labelling resources with relevant vocabulary or accessibility features makes it easier for the user to find relevant and [accessible information](#).
- Use responsive web design, which allows the content to adapt to the end users' output device.
- Create your website according to the [User Centered Design \(UCD\)](#) guidelines.
- Provide a site map. Give users a sense of where they are within your website.
- Use navigation mechanisms consistently.
- Provide a breadcrumb to determine where users are (navigation).
- Allow links and headings to be navigated using the Tab key. Provide keyboard shortcuts to important links.
- Provide ways to help users to find content. Include a search feature on each page.
- Offer a logical order of links and headers for users to navigate.
- Divide your information into manageable blocks.
- Use style sheets to control layout and presentation. Organise your documents so they may be read without style sheets.
- Create a style of presentation that is consistent across pages. Give each page a structure by using predefined headings. Your headings should follow a logical order.
- Include alternative text descriptions (alt text) for images.
- Check colour contrast with free tools.

- Allow all page functionalities to be device independent, meaning they can be used through a keyboard or voice control for example.
- Ensure that moving, blinking, scrolling or auto-updating objects or pages can be paused or stopped.
- Ensure the keyboard focus is not lost when a page refreshes.
- Include a Skip Navigation feature on each page.
- Separate information and structure from presentation to enable different presentations.
- Use a [semantic](#) structure for title, heading, quotations, block quote emphasis, list.
- Group related links, identify the group (for user agents), and, until user agents do so, provide a way to bypass the group.
- For data tables that have two or more logical levels of row or column headers, use markup to associate data cells and header cells.
- Ensure that equivalents for dynamic content are updated when the dynamic content changes.
- Check your web pages for accessibility issues using a three-step process:
 - Manual check.
 - Automated check using free resources provided below.
 - Test by trusted users of [assistive technology](#), like [screen readers](#), screen enlargement software and voice-input dictation.
- Test your pages in a speech browser.
- Avoid horizontal scrolling (scrolling from left to right or vice versa).
- Provide descriptions for form fields.

2.2 Resources to help make your online resources accessible

The following list of resources includes a selection of automated tools which can be used for accessibility checks. These tools are extremely valuable and useful, but can give false positives and negatives so please do not solely rely on them.

Easy instructions

- [W3C Web Accessibility Initiative](#): strategies, guidelines and resources for web accessibility

Advanced instructions

- [WebAIM WCAG 2.0 Checklist](#): checklist presenting recommendations for implementing HTML-related principles and techniques for those seeking WCAG 2.0 conformance

- [W3C markup validation service](#): checks the markup validity of Web documents in HTML, XHTML, SMIL, MathML, etc.
- [WAVE](#): web accessibility evaluation tool
- [Functional Accessibility Evaluator \(FAE\)](#): website accessibility evaluation tool
- The Paciello Group [Colour Contrast Analyser](#): provides a pass/fail assessment against WCAG 2.0 colour contrast success criteria and simulates certain visual conditions to demonstrate how web content appears to people with less than 20/20 vision.
- [TAW](#): WCAG 1.0 and 2.0 and mobileOK web checker (in English, Spanish, Catalan and Galician)
- [ACHECKER](#): web accessibility checker
- [Total Validator](#): all-in-one (X)HTML validator, accessibility validator, spell checker and broken links checker
- [AccessMonitor](#): web accessibility checker (in Portuguese)
- [Examinator](#): web accessibility checker (in Spanish)
- MSF&W [colour contrast ratio calculator](#): to check the contrast of colours on web pages
- [Pause, Stop, Hide](#): guidance on mechanism for users to pause, stop or hide animated content
- [TRACE Photosensitive Epilepsy Analysis Tool \(PEAT\)](#): free, downloadable resource to identify seizure risks in web content and software

Section 3: Making your printed material accessible

Although printed documents are difficult to access for many users with [print disability](#), the continued usage of printed documents in general – and especially in learning environments – will continue for the foreseeable future.

Print cannot be made as accessible as [electronic](#) information. Electronic information has the potential to integrate multimedia; therefore content can be shared through different [media](#). For example, text can be replaced by audio or sign language video. Depending on a user or learner's specific disability and/or special need, they may need a different perception channel or a mix of channels that print material cannot offer.

However, there are also users/learners that find printed material more accessible than electronic. Therefore print remains important, but cannot be made universally accessible.

One alternative to print material – with the same restrictions – is Braille.

3.1 How to make your printed material accessible

- Use 12 or 14 [font](#) or larger.
- Use sans-serif fonts.
- Provide an electronic copy of your file as an alternative.
- Use font and paper colour depending on user preference.
- Provide alternate modalities of your document, such as Braille (upon request) or large print versions. To create large print documents from an electronic file: first, use the keyboard shortcut 'ctrl shift A' to select all text, and then use the keyboard shortcut 'ctrl shift >' to increase the font size proportionally.
- Create and insert descriptions or alternative texts for hyperlinks, images, tables and all other types of content that cannot be seen by people with visual disabilities for Braille printers.

3.2 Resources to help make your printed material accessible

- [Load2Learn video on producing accessible files](#)
- [Load2Learn video on producing large print](#)

APPLYING THE GUIDELINES TO DIFFERENT MEDIA AND SPECIFIC FORMATS

The checklists below are designed for practitioners and are examples of how the Guidelines can be applied to specific media and formats.

For each specific format a combination of actions from Step 1 and Step 2 are combined to demonstrate how the recommendations can be applied. These checklists can be used to check or audit created materials.

Slideshows and presentations

Step 1:

- Text:
 - Use the simplest language which is appropriate for your document.
 - Use large fonts.
 - Use a sans serif font such as Arial, Helvetica or Verdana.
 - Use 'Bullets and Numbering' functions for lists.
 - Avoid excessive amount of information on one slide.
 - Use text and background colour combinations that provide a very good contrast.
 - Ensure text and graphics are also understandable when viewed without colour.
- Image:
 - Give your images an alternative text to describe the image.
 - Use a sufficient contrast of colours between image and background.
 - Avoid backgrounds with too many images, shapes or colours.
 - Avoid links or text being hidden behind other objects such as images.
- Audio:
 - Give your audio a text equivalent.
 - Allow volume control, fast forward, rewind and pause functions.
 - Make sure captions are synchronised with your audio.
- Video:
 - Ensure captions are synchronised with your video.

Step 2:

- Use the slide layouts offered by your software.
- Copy the text from the slide into the notes area.
- Fill in the metadata information to help users find the information through internet searches.

Online or e-learning tools

Step 1:

- Text:
 - Use the simplest language which is appropriate for the target group.
 - Divide your information into manageable and equal blocks.
 - Use 'Bullets and Numbering' functions for lists.
 - Adopt accessible templates for consistency.
 - Ensure your online training materials are also available in print.
 - Ensure online training can be paused, stopped and resumed.
- Images:
 - Give your images alternative text to describe them.
 - Avoid use of red, green and yellow, and lighter grey colours.
 - Use a high contrast of colours between image and background.
 - Avoid backgrounds with too many images, shapes or colours.
- Audio:
 - Give your audio a text equivalent.
- Video:
 - Ensure captions are synchronised with your video.

Step 2:

- Give each page a structure by using predefined headings. Your headings should follow a logical order.
- Offer a logical order of links, headers and all page functions for users to navigate.
- Provide metadata when offering a range of resources. Labelling resources with relevant vocabulary or accessibility features makes it easier for the user to find relevant and accessible information.
- Give users a sense of where they are within your website by ensuring that there is a visible or audible cue to show them where they are within the navigation.
- Give video either a text equivalent or captions. For videos do not just give captions of the words spoken, but also provide a description of what is taking place.
- Provide descriptions for form fields.

- Include a search feature on each page.
- When using interactive scenarios or cases, ensure a text equivalent is also available and can be accessed using a keyboard only.
- Use responsive web design, which allows the content to adapt to the end users' output device.
- Allow all page functionalities to be used through a keyboard only, including login, launch and print functions.

PDF documents

Step 1:

- Text:
 - Use the simplest language which is appropriate for your document.
 - Use large fonts.
 - Use a sans-serif font such as Arial, Helvetica or Verdana.
 - Use 'Bullets and Numbering' functions for lists.
- Image:
 - Give your images alternative text to describe them.
 - Use a high contrast of colours between text and background.
 - Avoid backgrounds with too many images, shapes or colours.
 - Avoid links being hidden behind other objects such as images.

Step 2:

- Specify the language of your document under 'properties'.
- Avoid saving your PDF document as an image.
- Tag your document.
- Use the accessibility checker offered by your software as a simple check before sharing the document.
- Use the most up-to-date versions of software to create a PDF. Newer software versions include more up-to-date accessibility features.
- Fill in the metadata information to help users find the information through internet searches.
- Include all relevant elements in your document structure.
- Provide descriptions for form fields.
- Ensure accessibility is not compromised when protecting PDF documents.

GLOSSARY

This glossary of key terms aims to support a shared language for all users of the Guidelines. Different sources for definitions have been used for this glossary:

- Existing definitions that are already in use at the international level, in particular key terms defined within:
 - (1) United Nations Educational, Scientific and Cultural Organization (UNESCO) / Microsoft *ICT Competency Framework for Teachers* (2011)
 - (2) UNESCO Institute for Information Technologies in Education / European Agency *ICTs in Education for People with Disabilities: Review of innovative practice* (2011)
- Key literature quotations and citations
- Operational definitions developed within the [i-access](#) and [ICT4IAL](#) projects.

Key terms

Accessibility – Article 9 of the United Nations (UN) Convention on the Rights of Persons with Disabilities defines accessibility as: ‘appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including [information and communications technologies](#) and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas’ ([United Nations, 2006, p. 8](#)) (2).

Accessible information – information provided in formats which allow every learner to access content ‘on an equal basis with others’ ([United Nations, 2006, p. 8](#)).

Assistive technologies (ATs) – ‘adaptive devices that enable people with special needs to access all manner of technical products and services. ATs cover a whole range of [ICTs](#), from customised keyboards and speech recognition software to Braille computer displays and [closed captioning](#) systems for TV’ (European Commission, 2011, *E-inclusion*) (2).

Captions – are intended for audiences who cannot hear the dialogue. In contrast to [subtitles](#), captions also include a description of who is speaking as well as sounds.

Closed captions – captions that can be selected to be visible or not versus captions that are visible by default.

Digital – (as in digital content, digital devices, digital resources, digital technology) – essentially, another word for computers and computer technology. (Computers store and process information by converting it all to single-figure numbers – digits.) (1).

The 'skills required to achieve digital competence. It is underpinned by basic skills in [ICT](#) and the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet' ([European Commission, 2008, p. 4](#)) (2).

e-accessibility – 'overcoming the barriers and difficulties that people experience when trying to access goods and services based on ICTs' ([European Commission, 2005](#)) (2).

EDUPUB – adapts 'the functionality of the [EPUB 3 format](#) to the unique structural, [semantic](#) and behavioral requirements of educational publishing' ([International Digital Publishing Forum, 2015](#)).

e-inclusion – 'both inclusive ICT and the use of ICT to achieve wider inclusion objectives. It focuses on participation of all individuals and communities in all aspects of the [information society](#)'. e-inclusion policy 'aims at reducing gaps in ICT usage and promoting the use of ICT to overcome exclusion, and improve economic performance, employment opportunities, quality of life, social participation and cohesion' ([European Commission, 2006a, p. 1](#)) (2).

e-learning – any forms of electronically supported learning and teaching. (2).

e-learning/online tool – tool or system that supports online learning.

Electronic – used to refer to materials that are accessible by a computer or other digital devices. It may include text, images, audio, video or a combination of these.

EPUB – a format of [electronic](#) or e-books. More specifically the '.epub is the file extension of an XML format for reflowable digital books and publications'. EPUB is composed of three open standards produced by the [IDPF](#) ([International Digital Publishing Forum](#)) ([DAISY, 2015](#)).

Font – a typography used in text-editing software. A sans serif font is a font without curls or strokes at the end of each character. Times New Roman is an exception of a sans serif font.

Format – how information is converted or packaged – such as text-editing programs or presentations – and delivered or presented to the user. The ending within file names usually shows the format it is saved in, such as .doc, .docx, .rtf, .xls, .csv, .jpg, .pdf, etc.

Information – generally understood to refer to a message or data that is communicated concerning a specific issue. Specifically, these Guidelines focus on the aim of sharing messages to inform and build knowledge in a learning environment.

Within the Guidelines the different types of information considered are text, image, audio and video.

Information and communication technology (ICT) – 'consists of all technical means used to handle information and aid communication, including

both computer and network hardware as well as necessary software. In other words, ICT consists of IT as well as telephony, broadcast [media](#), and all types of audio and video processing and transmission' (FOLDOC, cited by [European Agency](#)) (2).

Information providers – any individual or organisation that creates and distributes information.

Information society – 'a society in which the creation, distribution and treatment of information have become the most significant economic and cultural activities' ... The information society is 'considered as a necessary previous step to build Knowledge Societies' ([UNESCO/IFAP, 2009, pp. 20–22](#)) (2).

Learners with disabilities and/or special needs – the potential target group of people who can benefit from more accessible [information](#) provision. This phrasing respects the terminology of both the [United Nations Convention on the Rights of Persons with Disabilities](#) – UNCRPD (2006) and agreements reached with the [ICT4IAL project partners](#).

Media – a channel through which information can be shared. Media usually contains different types of information simultaneously. Examples include electronic documents, online resources and [online learning tools](#).

Metadata – a digital label given to information. It is machine-readable and aids the search and categorisation of information, thereby improving searchability.

Open Educational Resource (OER) – defined by the [European Commission](#) as 'learning resources that are usable, adaptable to specific learning needs, and shareable freely'. Another widely used definition, promoted by the [William and Flora Hewlett Foundation](#), defines OER as 'teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others'.

Print disability/impaired – persons 'who are not able to use printed books, newspapers and magazines – including those with dyslexia, motor disabilities or age related macular degeneration' ([DAISY, 2015](#)).

Scalable – the ability to change size and zoom of information according to the needs of the user/learner or the device used.

Semantic – [literally 'meaning'](#). When used in connection with giving information structure, it stresses the necessity to give a meaningful structure.

Screen reader – a software program designed to give access from a computer, tablet, mobile or other digital device by reading the presented information with the use of a synthetic voice. In addition to reading text, a screen reader also allows a user/learner to navigate and interact with the content using their voice. For Braille users a screen reader can also supply the information in Braille.

Structured text – text information which has been organised with an established reading order and headings using software functions such as applying styles or [tagging](#).

Subtitles – are intended for audiences that do not understand the language used in a dialogue.

Tagging – process which embeds information about the reading order, flow and organisational structure within an electronic document.

Technology – often used as another word for ICT, although strictly speaking ‘technology’ can mean almost any type of tool or applied knowledge. For example, pencil and paper, slates, blackboards and whiteboards are all types of writing technology (1).

Usability – ‘extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use’ ([International Organization for Standardization, ISO 9241-11:1998\(en\)](#)).

User-centred design – a design approach that focuses on making systems and tools usable. The goal is a high degree of [usability](#).

WCAG – ‘Web Content Accessibility Guidelines (WCAG) is developed through the [W3C process](#) in cooperation with individuals and organizations around the world, with a goal of proving a single shared standard for web content accessibility that meets the needs of individuals, organizations, and governments internationally’ ([World Wide Web Consortium – W3C, 2012](#)).

Web 2.0 – ‘web applications that facilitate interactive information sharing, interoperability, [user-centred design](#), and collaboration on the World Wide Web. A Web 2.0 site gives its users the free choice to interact or collaborate with each other in a social media dialogue as creators of user-generated content in a virtual community, in contrast to websites where users (consumers) are limited to the passive viewing of content that was created for them. Examples of Web 2.0 include social-networking sites, blogs, wikis, video-sharing sites, hosted services, web applications’. The term ‘Web 2.0’ can be traced back to Tom O’Reilly and the O’Reilly Media Conference in 2004 (2).

World Wide Web Consortium (W3C) – ‘an international community where Member organisations, a full-time staff, and the public work together to develop Web standards. [...] W3C’s mission is to lead the Web to its full potential’ ([World Wide Web Consortium – W3C, 2015](#)) (2).