



InSIDE: Including Students with Impairments in Distance Education

**Deliverable
DEV3.3**

**Adaptations and Delivery of LMS
platform**

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Work Package	3 - DEVELOPMENT
Issue Date	15 November 2021
Report Status	Final

Co-funded by the
Erasmus+ Programme
of the European Union



This project (598763-EPP-1-2018-1-EL-EPPKA2-CBHE-JP) has been co-funded by the Erasmus+ Programme of the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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Project Information

Project Number	598763-EPP-1-2018-1-EL-EPPKA2-CBHE-JP
Grant Agreement Number	2018-3218 /001-001
Action code	CBHE-JP
Project Acronym	InSIDE
Project Title	Including Students with Impairments in Distance Education
Funding Scheme	Erasmus+ KA2
Date of EC approval	13/12/2018

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Document Information

Title	Deliverable DEV3.3 Adaptations and Delivery of LMS platform
Issue Date	15/11/21
Deliverable Number	DEV3.3
Work Package	WP3: Development
Task Number	Task 3.3: Software adaptations on the selected LMS with the aim of accessibility, usability and educational efficiency improvement for both students with ViHeMo impairments and students without impairments
333Activity number	A.3.3.1 Implementation of the adaptations related to the accessibility issues A.3.3.2 Implementation of the adaptations related to the usability issues A.3.3.3 Configuration of the tools/services that will improve the educational efficiency of the LMS A.3.3.4 Delivery of the adapted LMS
Partner Responsible	UOA
Partners involved	JKU
Authors	Alexandros Pino, and Georgios Kouroupetroglou, Ioannis Koutalidis
Status	Version 2.0, Final
Dissemination Level	PU <ul style="list-style-type: none"> • PU Public • PP Restricted to other programme participants (including the Commission Services) • RE Restricted to a group specified by the consortium (including the Commission Services) • CO Confidential, only for members of the consortium (including the Commission Services)

Version History

Version	Date	Changed	Author(s)
1.0	09/04/2021	First Draft	Pino, G. Kouroupetroglou, I. Koutalidis
2.0	25/01/2023	Final	Pino, G. Kouroupetroglou, I. Koutalidis

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Abbreviations

Acronym	Term
DE	Distance Education
HE	Higher Education
HEI	Higher Education Institution
InSIDE	Including Students with Impairments in Distance Education
JKU	Johannes Kepler University
LMS	Learning Management System
UABT	University of Abou Bekr Belkaid Tlemcen
UAE	Abdelmalek Essaadi University
UB2LA	Blida 2 University
UCA	Cadi Ayyad University
UIT	Ibn Tofail University
UM5R	University of Mohammed V in Rabat
UMMTO	Mouloud Mammeri University of Tizi-Ouzou
UOA	National and Kapodistrian University of Athens
UOM	University of Macedonia
US	University of Sousse
USFAX	University of Sfax
USTO	University of Sciences and Technology of Oran Mohamed-Boudiaf
UTM	University of Tunis El Manar
ViHeMo	Visual, hearing, mobility/physical
WP	Work Package

About this document

The document is a deliverable of the InSIDE project, prepared by the InSIDE UOA project team. Vital part of the document is the numerous and extensive Appendices at the end of the document.

The present deliverable report covers the following project tasks and activities:

TASK 3.3 Software adaptations on the selected LMS with the aim of accessibility, usability and educational efficiency improvement for both students with ViHeMo impairments and students without impairments

Activities:

- **A.3.3.1** Implementation of the adaptations related to the accessibility issues
- **A.3.3.2** Implementation of the adaptations related to the usability issues
- **A.3.3.3** Configuration of the tools/services that will improve the educational efficiency of the LMS
- **A.3.3.4** Delivery of the adapted LMS

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1. Introduction

Based on the previous results of the InSIDE project (results from PR1.1 State of the Art concerning DE programmes, PR1.3 Recording of the LMSs, DEV3.1 Assessment of the most widespread LMSs, and DEV3.2 Detailed assessment of an open-source LMS), the most widespread Learning Management Systems (LMSs) were critically examined in reference to their accessibility and usability aspects, targeting to propose educational efficiency improvements to increase their usage by individuals with disabilities and students without impairments. Hence, LMS developers or providers could apply the proposed improvements contained in these documents (Koustriava, et al., 2020).

The answer to what LMS best suits an educational project is not trivial. Three factors contribute to the complexity of this question. Firstly, the ecosystem of software implementations for Distance Education (DE) delivery changes quickly pushed by the constant evolution of DE and innovations in educational institutions. Secondly, the features of LMSs are quite diverse and difficult to match when comparing. This fact may be explained due to the different teaching methodologies used to ground implementation and disparity in targeted learner profiles. Thirdly, each educational project has its own priorities and requirements. The establishment of appropriate criteria to weight the desired features for the selection of the LMS is of paramount importance and one of the key points for the success of a distance educational project (Salinas Lopez, 2020).

Moodle is the world's most popular Learning Management System (LMS) (moodle, 2020a). It is also, a learning platform designed to provide educators, administrators, and learners with a single robust, secure, and integrated system to create personalized learning environments (moodle, 2020b). Moodle is designed to provide equal functionality and information to all people. This means that there should be no barriers for people regardless of disabilities, assistive technologies that are used, different screen sizes and different input devices (e.g.: mouse, keyboard, and touchscreen) (moodle, 2019).

All non-text content in Moodle that is presented to the user can have a text alternative that serves the equivalent purpose. The Moodle interface is presented as an HTML application developed to comply with the WCAG AA standard for accessibility. All parts of the Moodle interface are either native HTML controls with correct accessible text descriptions, or advanced HTML controls that have been developed to comply with the WCAG 2.0 AA as well as the Section 508 standards and tested with a range of screen reader software (eThink, 2018).

Furthermore, the built-in “Atto text editor” in Moodle provides many of the tools you need to design your course content with accessibility in mind. Some helpful functionality and features of the “Atto text editor” include the ability to edit section headings, provide descriptions for activities and discussion forums, and compose an answer to a quiz question. The “Atto text editor” also has an “Accessibility Checker” tool that will scan the content of the text editor and alert you to a range of accessibility issues that may be found within the text (eThink, 2018).

Even though the “Atto text editor” can produce accessible content on the Moodle platform and checks the content it creates, the InSIDE UOA project team noticed that no such check is performed on the files being uploaded on the platform. To deal with this issue, the scientific team provides the user with instructions for creating accessible files that instruct him/her to modify his/her files appropriately before posting them on the platform. Moodle platform is also altered by the InSIDE UOA project team so that an warning message is displayed whenever the user attempts to upload a file to a course to remind the user to check it for accessibility. A fresh Moodle installation on the UOA’s servers was used to perform these alterations and a special universal menu has been added to give access to resources and guidelines for preparing accessible documents to be uploaded on the platform.

This altered and accessibility-enhanced Moodle installation, but also its usability and e will serve the needs of following InSIDE project’s tasks activities, such as trainings.

The present deliverable report covers the following project tasks and activities:

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TASK 3.3 Software adaptations on the selected LMS with the aim of accessibility, usability and educational efficiency improvement for both students with ViHeMo impairments and students without impairments

Activities:

- **A.3.3.1** Implementation of the adaptations related to the accessibility issues (Section 3. Moodle Accessibility, Section 5. Modification of Moodle to improve its accessibility)
- **A.3.3.2** Implementation of the adaptations related to the usability issues (Section 2. Accessible Documents)
- **A.3.3.3** Configuration of the tools/services that will improve the educational efficiency of the LMS (Section 4. Technical features of the InSIDE Moodle platform installation)
- **A.3.3.4** Delivery of the adapted LMS (Appendices 1 to 11)

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2. Accessible Documents

2.1. Creating Accessible Documents

Following the principles of Universal Design for Learning (Kouroupetroglou et al, 2015, Riviou & Kouroupetroglou, 2014, Riviou, Kouroupetroglou & Oikonomidis, 2015), when creating content, there are a few basic steps that should be followed to assure your content is accessible, usable, and educational efficient for both students with ViHeMo impairments and students without impairment. For simplicity, with the use of the term accessibility in the next of this document we also include its usability and its educational efficiency for both students with ViHeMo impairments and students without impairments.

The core steps needed for accessibility are the same regardless of whether your document is in HTML, Microsoft Word, Adobe PDF, or another document format (University of Washington, 2021):

- Use easily readable fonts
- Use appropriate color/contrast combinations
- Use headings
- Use lists
- Use meaningful hyperlinks
- Add alternate text to images
- Identify document language
- Use tables wisely
- Understand how to export from one format to another.

2.1.1. Use easily readable fonts

Your choice of font family, style, weight, size, color, and line-height can all affect its legibility and readability on screen. Legibility is the ability of someone to discern what is written. Capta text is often barely legible, as an example. Avoid the use of Script text, for legibility reasons. Readability is how easy or difficult it is to read the content. Readability is affected by not only your style of writing, but your choice of and formatting of text on the page.

When selecting a font family for screen viewed text, you will want to select families and weights that have a substantial stroke thickness and medium sized x-heights. The x-height is the height of the lower case letter x within the font family. All the lower case letters within the font typically have the same height as the x height.

Sans-serif fonts, such as Arial, Verdana, Helvetica, Tahoma, Trebuchet MS, or Myriad Web Pro are good choices for body text. Though you want to pick fonts with substantial stroke thickness, it may be a good idea to avoid the use of a font that is designed primarily as bold, such as Arial Rounded MT Bold, because you are left with few options for formatting for importance. If you apply a Strong Style (bolding), to an already bold font, it makes the font so thick, it becomes difficult to read on screen (PRESSBOOKS, 2021).

2.1.2. Use appropriate color/contrast combinations

Some users have difficulty perceiving text if there is too little contrast between foreground and background. The W3C Web Content Accessibility Guidelines 2.0 define specific contrast ratios that must be met in order to comply at particular levels. In order to meet the guidelines at Level AA, text or images of text must have a contrast ratio of at least 4.5:1 (or 3:1 for large text). In order to meet the guidelines at the stricter Level AAA, the contrast ratio must be at least 7:1 (or 4.5:1 for large text) (University of Washington, 2021)

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2.1.3. Use Headings

Headings and subheadings should be identified as such using the built-in heading features of the authoring tool. Headings should form an outline of the page content (Heading 1 for the main heading, Heading 2 for the first level of sub-headings, Heading 3 for the next level of sub-headings, etc.). This enables screen reader users to understand how the page is organized, and to quickly navigate to content of interest. Most screen readers have features that enable users to jump quickly between headings with a single keystroke.

Virtually every document authoring format includes support for headings and subheadings (University of Washington, 2021).

2.1.4. Use Lists

Any content that is organized as a list should be created using the list controls that are provided in document authoring software. Most authoring tools provide one or more controls for adding unordered lists (with bullets) and ordered lists (with numbers). When lists are explicitly created as lists, this helps screen readers to understand how the content is organized. When screen reader users enter a list, their screen reader informs them that they are on a list and may also inform them of how many items are in the list, which can be very helpful information when deciding whether to continue reading (University of Washington, 2021).

2.1.5. Use Meaningful Hyperlinks

Links presented in an electronic document should convey clear and accurate information about the destination. Most authoring tools allow the creator to assign a hyperlink to text (University of Washington, 2021).

2.1.6. Add Alternate Text for Images

Users who do not have the ability to see images depend on content authors to supplement their images with alternate text, which is often abbreviated “alt text”. The purpose of alt text is to communicate the content of an image to people with blindness. The alt text should be succinct, just enough text to communicate the idea without burdening the user with unnecessary detail. When screen readers encounter an image with alt text, they typically announce the image then read the alt text.

Most authoring tools provide a means of adding alternate text to images, usually in a dialog that appears when an image is added, or later within an image properties dialog.

If images are purely decorative and contain no informative content, they do not require a description. However, they may still require specific markup, so screen readers know to skip them.

Also, images that require a lengthier description, such as charts and graphs, may require additional steps beyond adding alt text (University of Washington, 2021).

2.1.7. Identify document language

Leading screen reader software is multilingual, and can read content in English, Spanish, French, and a wide variety of other languages. To ensure that screen readers will read a document using the appropriate language profile, the language of the document must be identified.

The language of any content written in a language other than the document’s default language should also be identified. With this information, supporting screen readers will switch between language profiles as needed on the fly.

Most document authoring tools provide a means of identifying the document language as well the language of specific parts (University of Washington, 2021).

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2.1.8. Use Tables Wisely

Tables in documents are useful for communicating relationships between data, especially when those relationships can be best expressed in a matrix of rows and columns. Tables should not be used to control layout. Authoring tools have other means of doing this, including organizing content into columns.

If your data is best presented in a table, try to keep the table simple. If the table is complex, consider whether you could divide it into multiple smaller tables with a heading above each.

A key to making data tables accessible to screen reader users is to clearly identify column and row headers. Also, if there are nested columns or rows with multiple headers for each cell, screen readers need to be explicitly informed as to which headers relate to which cells (University of Washington, 2021).

2.2. Checking the Accessibility of a PDF

It is always best, if possible, to start with an accessible source document (e.g., in Microsoft Word) and export to an accessible PDF. This way, if the document is edited later, the document's accessibility features will still be intact; and when the document is exported again to PDF, the accessibility features will again be passed to the PDF.

However, if the original source document is not available, accessibility features can be added to the PDF using Adobe Acrobat Pro DC.

Consult the following checklist to check a PDF for accessibility. To complete each of the items in this checklist, you will need Adobe Acrobat Pro DC. The checklist specifically applies to Acrobat Pro DC (University of Washington, 2021).

WebAIM's tutorial on [PDF Accessibility](#) makes for an excellent accompaniment to the current checklist.

When checking the accessibility of a PDF follow the steps below (University of Washington, 2021):

Step 1. Does document have text?

How to test: Try selecting text using a mouse, or select all text using Edit → "Select All" from the Acrobat menu.

If No, this is an image file and is not accessible. Convert to text using View → Tools → "Recognize Text."

Step 2. Is document tagged?

How to test: Go to File Properties (Ctrl+D in Windows, Command+D in Mac). In the bottom left corner of the Document Properties dialog, see the "Tagged PDF" field.

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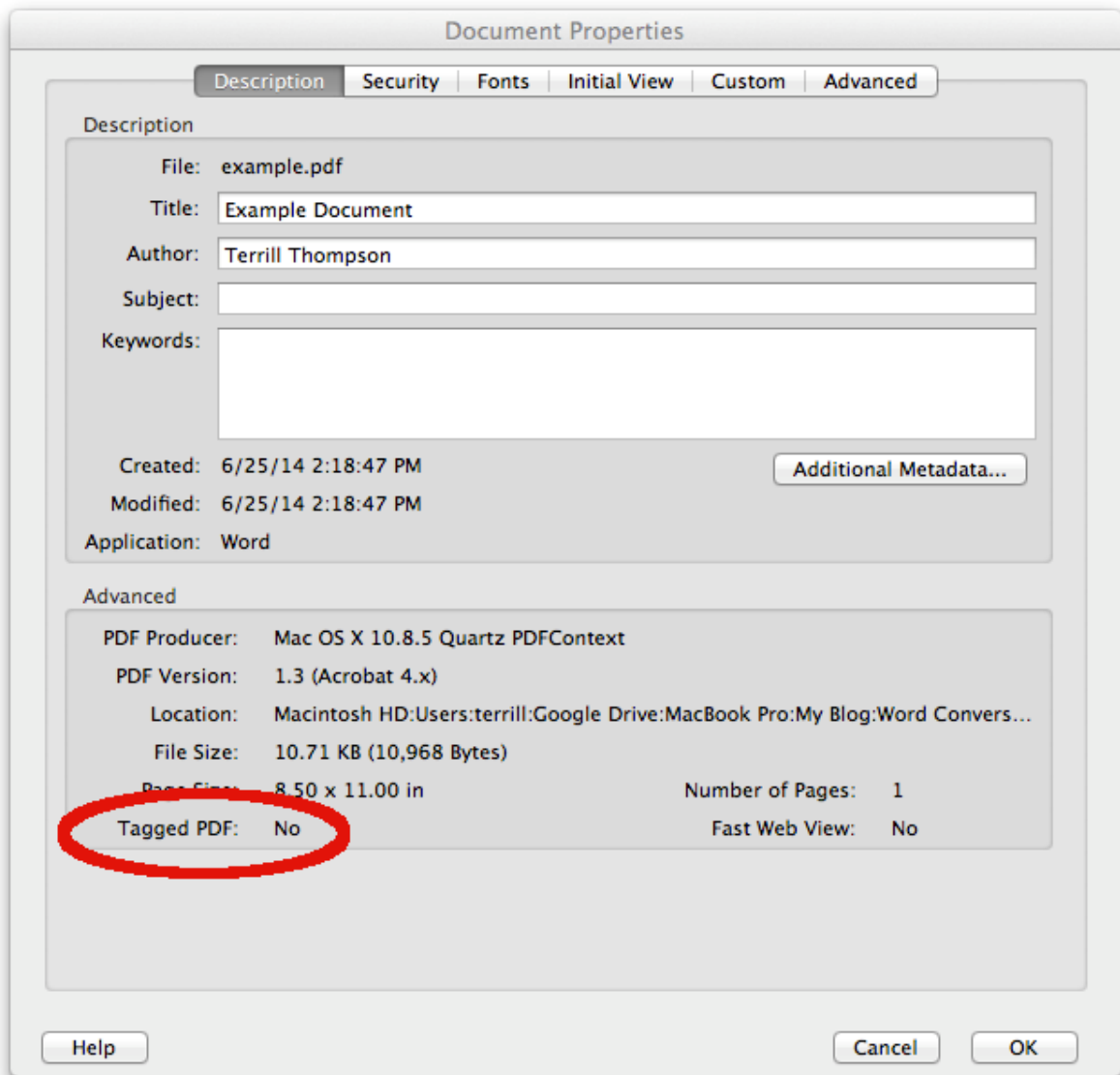


Figure 1. PDF Properties

If No, this document needs to be tagged. Tags provide the structure on which accessibility is built. Add tags by selecting View → Tools v Accessibility → “Add Tags To Document.”

Step 3. Check for any lingering errors.

How to test: Run the accessibility checker that is built into Acrobat Pro. Select Tools → Accessibility → “Full Check” then read the report and follow the prompts.

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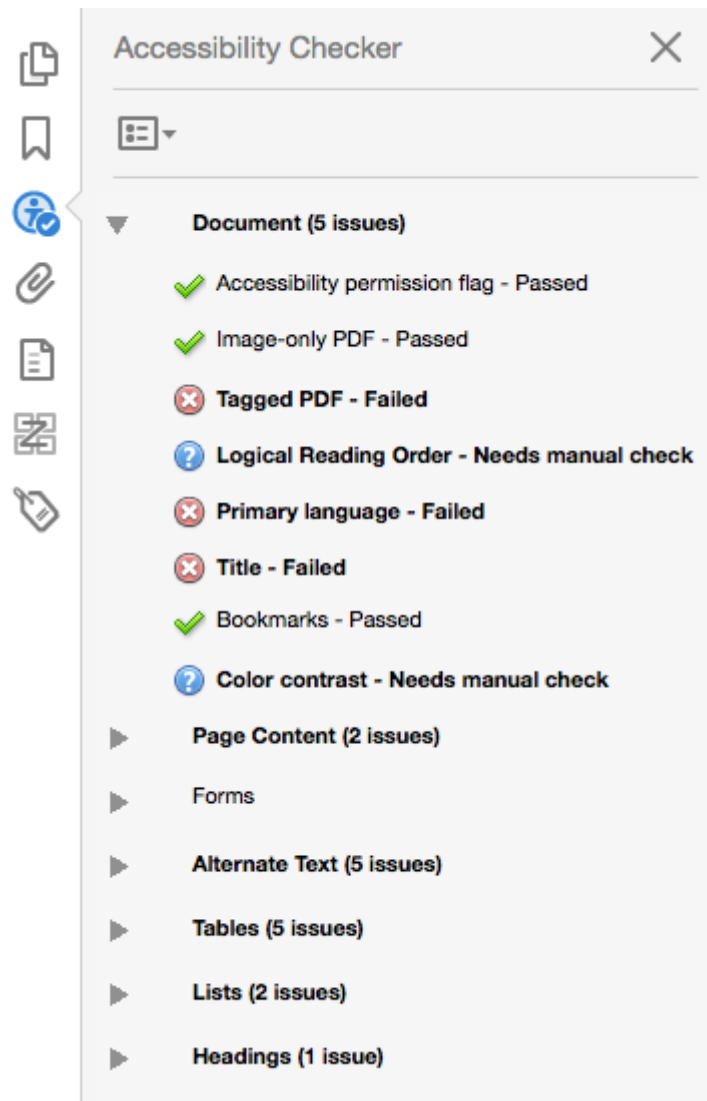


Figure 2. The results of the Accessibility Checker in Adobe Acrobat Pro

The report lists items in various categories such as Document, Page Content, etc. Each item is preceded by an icon indicating that the item either passes, fails, or requires manual inspection. Right click on any item to see a list of options for fixing the problem or learning more about it.

This is the final step in our checklist, rather than the first step, because some documents generate dozens of errors that can easily be addressed with the first two steps. This way, the accessibility checker will report fewer problems and will be easier to read and work with (University of Washington, 2021).

2.3. PDF Accessibility Checkers

During the research on the abilities provided by various PDF Accessibility Checkers, the the InSIDE UOA project team reached the following conclusions on some of the most widely used PDF Accessibility Checkers.

2.3.1. [PAVE](#)

- It is an online PDF Accessibility Checkers
- [Here](#), you can find instructions on how to use PAVE Accessibility Checker.
- You can check files of maximum size: 5 MB

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- It provides detailed presentation of file accessibility errors
- It provides automatic correction of some file accessibility errors
- It provides automatic definition of element types
- It has the ability to manually correct accessibility errors/modify the file, by clicking on each item that appears on the issues list.
- It provides easy detection and correction of accessibility errors (by highlighting the sentence)
- It checks the reading order of a file.

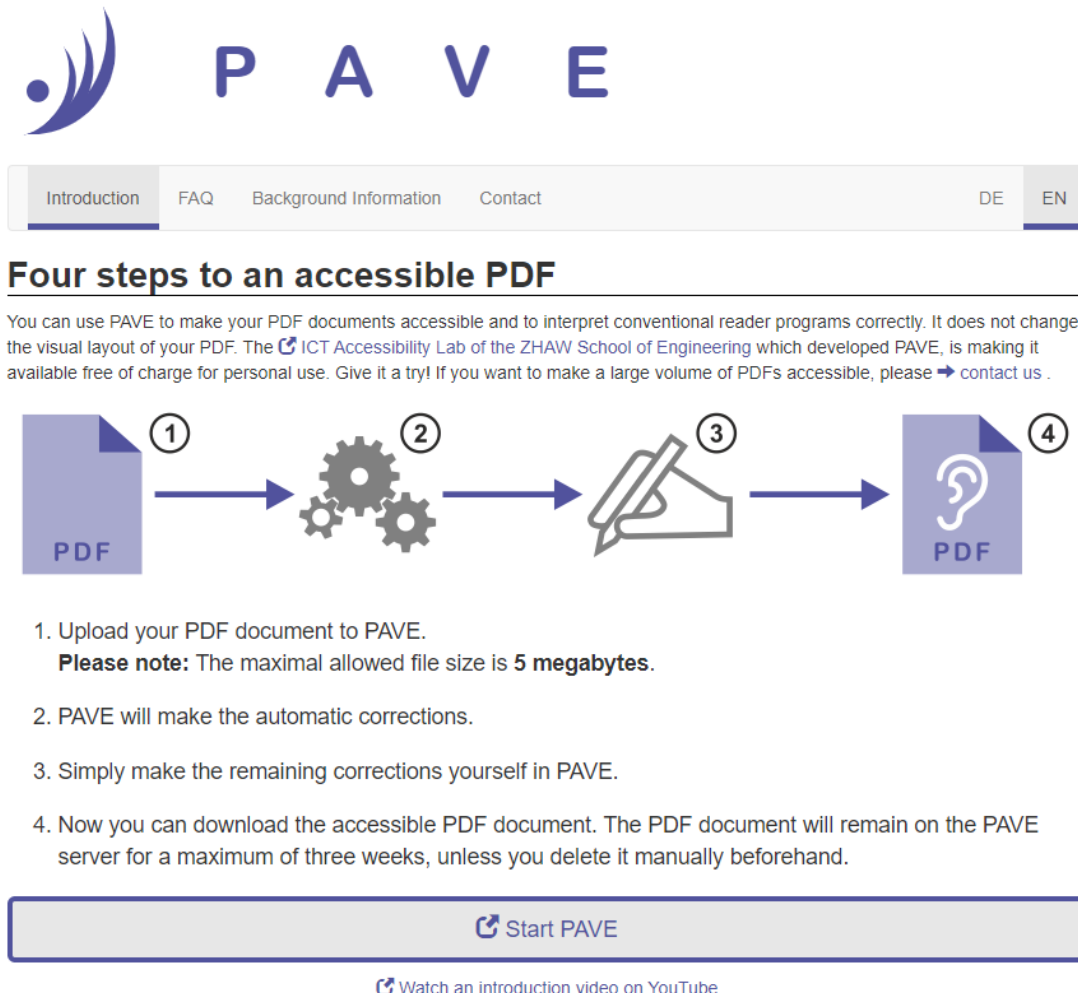


Figure 3. PAVE Accessibility Checker

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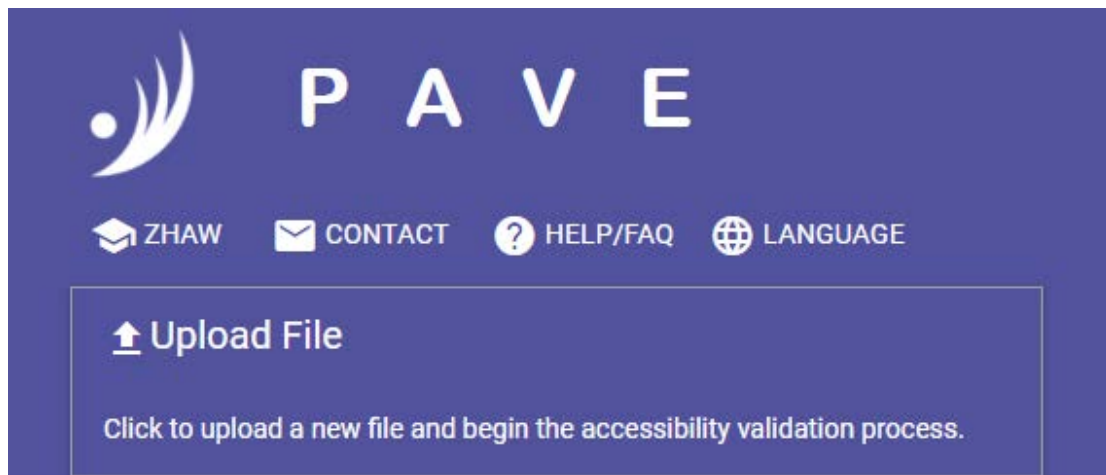


Figure 4. PAVE Accessibility Checker - Upload File

2.3.2. Tingtun

- You can check files of maximum size: 10 MB
- It does not display file accessibility errors in detail
- It does not display the places where file accessibility errors are present.

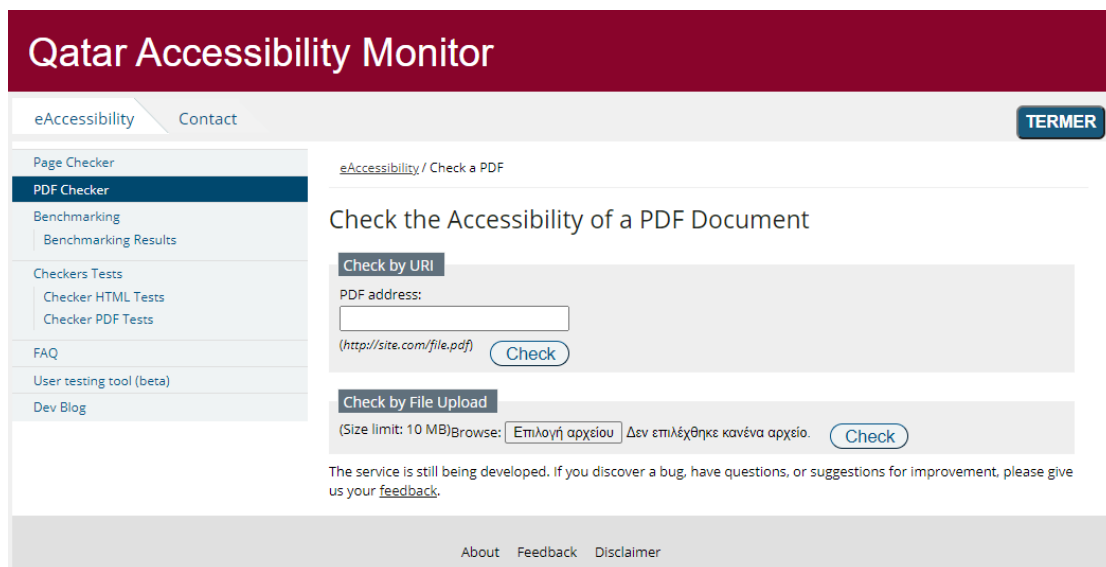


Figure 5. Tingtun PDF Accessibility Checker

2.3.3. PAC 3

- It is a portable PDF Accessibility Checkers
- It has the ability of summarizing and presenting file accessibility errors in detail
- It provides summary report as a PDF
- It provides screen reader preview
- It checks the logical structure of a file
- It provides document statistics.

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Figure 6. PAC 3 PDF Accessibility Checker

2.3.4. [Adobe Acrobat Pro DC Accessibility Checker](#)

The accessibility checking tools in Adobe Acrobat Pro DC -Accessibility Checker (Full Check) and the Make Accessible action wizard- can identify many issues in PDF documents that may be in conflict with Adobe's interpretations of the accessibility guidelines referenced in the application and its documentation. These tools do not check documents for all accessibility criteria, including those in such referenced guidelines, and Adobe does not warrant that documents comply with any specific guidelines or regulations (Adobe, 2021).

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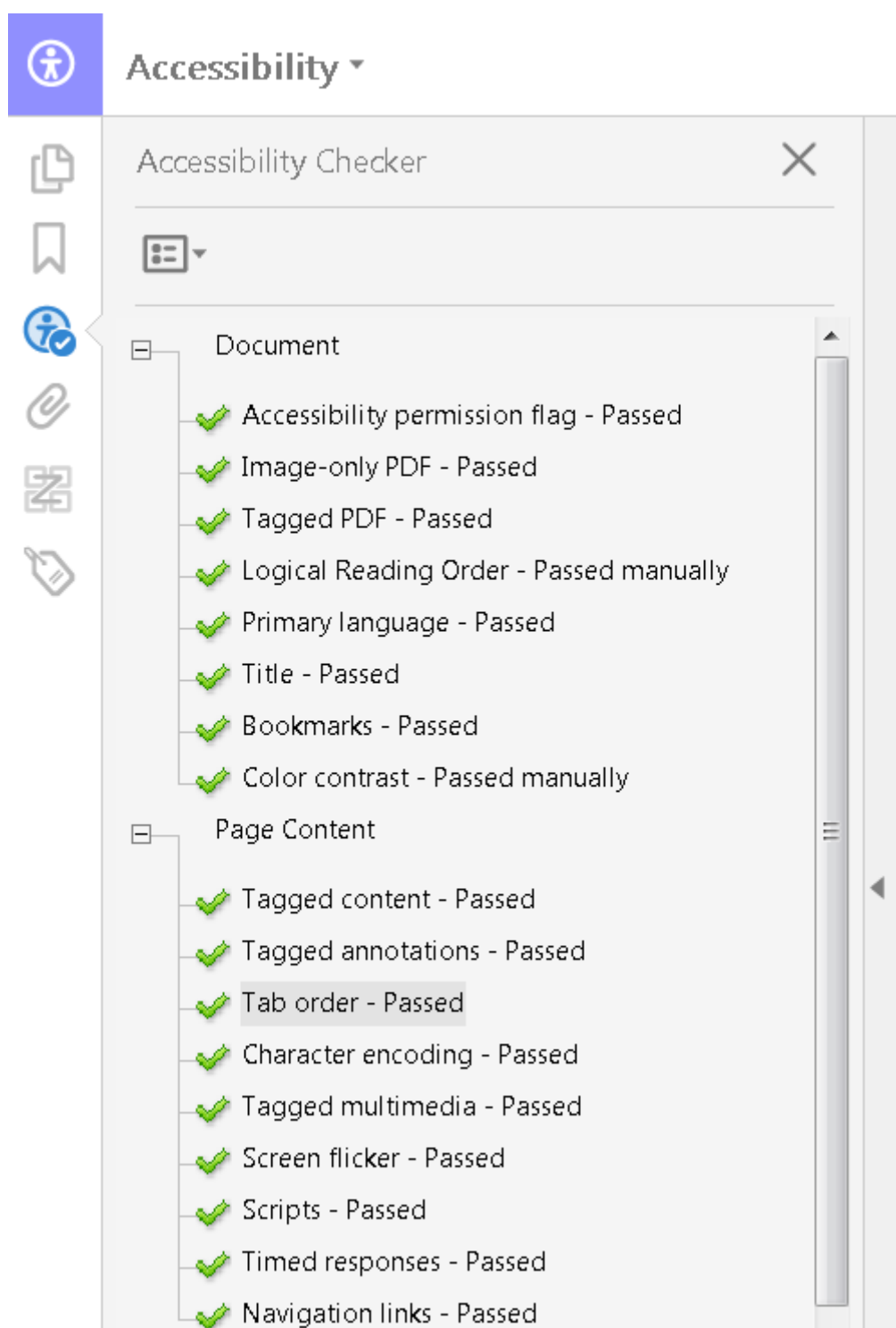


Figure 7. Using the Acrobat Pro DC Accessibility Checker

2.3.5. [axesPDF QuickFix](#)

- [Here](#), you can find instructions on how to use axesPDF QuickFix Accessibility Checker.

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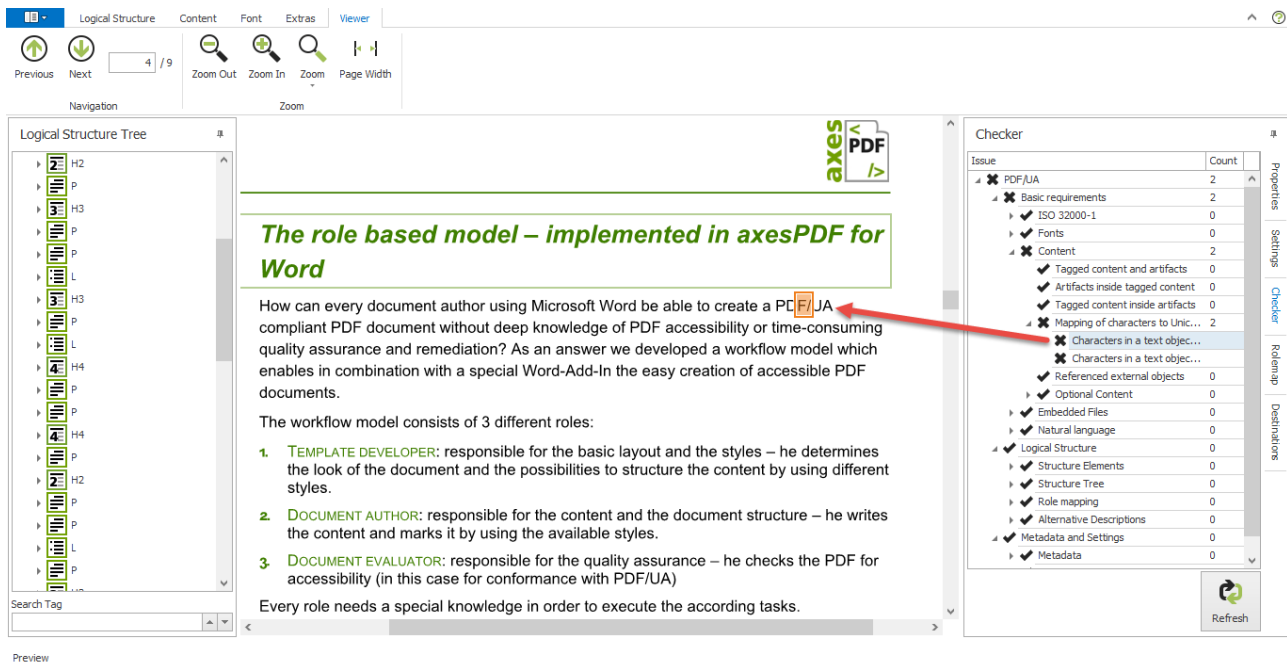


Figure 8. axesPDF QuickFix Accessibility Checker

2.4. Google Docs Accessibility Checkers

2.4.1. Grackle Docs

Grackle Docs is an add-on that runs in Google Docs.

When opened, it scans the current document for accessibility issues. It runs automatically when that document is opened in the future.

When the scan finishes, Grackle Docs arranges the document's elements and structures into 6 categories:

- Document
- Images
- Headings
- Tables
- Landmarks
- Content

These categories can be seen in the user interface on the right side of the screen.

Elements in each are marked as either accessible or inaccessible. Changes are made by selecting and editing these elements in these categories. For example, a table does not have the header row specified with a tag. When an element is changed with Grackle Docs, it edits the tags for that element in the document. This edit is immediate, and no saving is required (grackle Docs, 2021).

- It provides detailed presentation of file accessibility errors
- It corrects automatically some file accessibility errors
- It provides easy detection and guidelines on how to correct accessibility errors
- It is provided a trial version of the product for a thirty-days time period.

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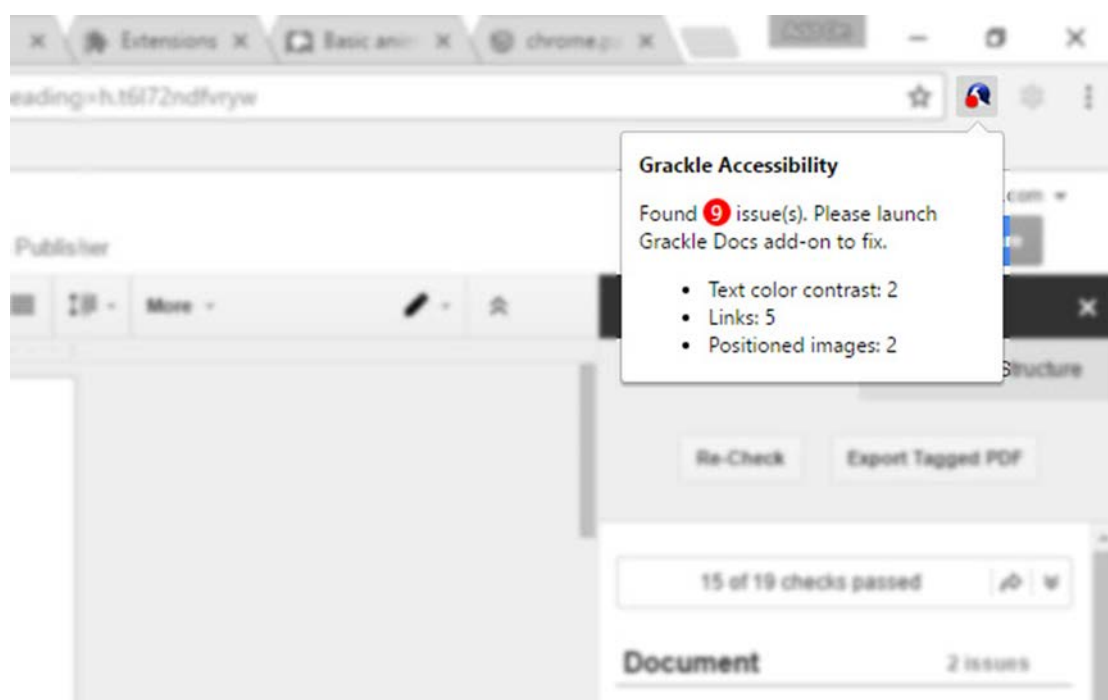


Figure 9. Grackle Docs Accessibility Checker

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3. Moodle Accessibility

Moodle is designed to be accessible by default to the widest possible audience. This means that both the application and the content is designed to be perceivable, operable, understandable and robust according to the definitions provided by WCAG 2.0 (Holland & Plana, 2018).

3.1. Accessibility principles

Based on WCAG 2.0, the four main guiding principles of accessibility are:

- Perceivable
- Operable
- Understandable
- Robust

Conveniently, these principles spell out an acronym that is relatively easy to remember: POUR. The idea is to create a POUR web site, so to speak. The pun may be a bad one, but if it helps developers memorize the principles, then it has served its purpose. Each of these principles is discussed more in the sections that follow (WebAIM, 2013). These principles also apply to documents on the web, especially educational material.

3.1.1. Perceivable

Any discussion of web accessibility is based upon the assumption that people need to be able to perceive web content. They need to be able to input the information into their brain so that they can process it. If the information cannot get into the brain, it is inaccessible. As obvious as that statement may sound, it is a principle which is frequently ignored by developers. Too many sites contain web content that cannot even be perceived by some of the people who would like to access it.

3.1.2. Operable

Not everyone uses a standard keyboard and mouse to access the web. Some people use adaptive devices or alternative devices that accommodate their disabilities. Some people simply prefer to use the alternative technologies. While this may not seem like an important point at first, consider the fact that some web content can be operated only with a mouse. Mouse-dependent web content will be inaccessible to a person cannot use a standard mouse, due to tremors, insufficient fine motor control, or even a lack of hands altogether.

Users should be able to find, navigate through, and interact with web content. Search features, site indexes, and site maps allow users to locate content within a Web site. With web pages or sections of Web content, users should be able to bypass extraneous or irrelevant pieces of content in order to focus on the content of interest to them. They should be able discern the structure of the content by its headings, subsections, bulleted lists, and other elements of semantic markup. In other words, the content itself should be navigable or operable by multiple methods (WebAIM, 2013).

3.1.3. Understandable

Understandability can be just as big a barrier to accessibility as any of the more technical issues. Talking about understandability moves the discussion into the broader realm of usability. Usability became a hot topic in the late nineties and early 21st century. It still is a hot topic but has moved from being a fringe fad to being a topic of mainstream conversation among web developers.

The functionality of web content must also be understandable. Users must be able to understand all navigation and other forms of interaction. On static web sites, the interaction may be limited to hypertext links. In more complex Web content, the interaction can be extremely complex, requiring the user to pass through multiple steps or stages, to make decisions along the way, input information,

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confirm information, and so on. Every point of interaction deserves attention in order to give users the best experience possible. If users do not understand any of the points of interaction, they may not be able to complete the necessary tasks on that web site (WebAIM, 2013).

3.1.4. Robust

Not everyone uses the same technologies now, nor will they in the future. People use different operating systems, different browsers, and different versions of browsers. Some people have advanced features enabled. Others have these features turned off. Some people are early adopters of new technologies. Others are slow to adapt to the rapidly-changing currents in the flow of technological advances.

Despite the differences between users and the technologies they use, they all expect the web to work. When they go to a site that uses methods not supported by their technologies, they get frustrated and may never return. In the past it was common to see sites optimized for certain browsers or versions of browsers. Fortunately, most developers now try to develop their content so that it will work in many versions of many browsers.

Users should be allowed to choose their own technologies to access web content. This allows the users to customize their technologies to meet their needs, including accessibility needs. Web content that requires a certain technology, such as a certain browser or screen reader, may exclude some types of users who either do not want to use that technology or cannot use it because of their disability. As a general rule, the more control the user has, the more likely the user will be able to access the content effectively.

Of course, there are limits to this logic. Many technologies and web accessibility techniques are not supported in older browsers and screen readers. Modern web developers should not be forced to develop to the "lowest common denominator". Developers can and should feel free to take advantage of technological advances, including in areas related to accessibility. When considering implementation of innovative technologies and techniques, they must strike a balance between pushing innovation boundaries and considering the technologies their end users will be using.

Developers can set a baseline of requirements. For example, they could decide to fully support browsers that are four years old or newer. Users of older browsers could still access the content, but perhaps it would not be styled properly due to lack of support for newer features. As long as the baseline is not too restrictive, limiting full support to a subset of technologies is a reasonable approach. And, again, to the extent possible, it is still best to let the user decide which technologies to use (WebAIM, 2013).

3.2. Browser access features

In recent years, great attention has been paid to browsers design and implementation by developers and scientists dealing with accessibility issues and assistive technologies for people with disabilities. The most accessible browsers for people with disabilities and those which give more possibilities for content customization to these people are the following (Holland & Plana, 2018):

- Chrome
- Firefox
- Edge (Microsoft)

3.3. Content Development

Moodle platform enables users to create and edit the content presented on the platform. This ability is provided to users through the tool "Atto Editor". "Atto Editor" is a custom editor built for Moodle platform which focuses on great user experience provision and also, accessible content creation.

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Moreover, “Atto Editor” has some features which help users to check the content they create as for its accessibility. These features are (Holland & Plana, 2018):

- Accessibility checker
- Prompts when adding media
- Feature rich equation editor (Using Mathjax.org).

3.3.1. Atto Editor

The Atto text editor (sometimes referred to as the “HTML editor”) has many icons to assist the user in entering content. Many of these icons and functions should be familiar to anyone who uses a word processor. Some examples of where you will see the text editor include: Editing Section headings, description of an activity, writing an answer to a quiz question or editing the content of many blocks.

The default text editor in Moodle is the Atto editor, built specifically for Moodle. There is also a TinyMCE editor and a plain text editor.

Text editors can be enabled, disabled or a different one set to default from Administration → Site administration → Plugins → Text editors → Manage editors. The order of priority may also be specified here.

If more than one text editor is enabled, users can select their preferred editor via their preferences page in the user menu (top right) (moodle, 2021d).

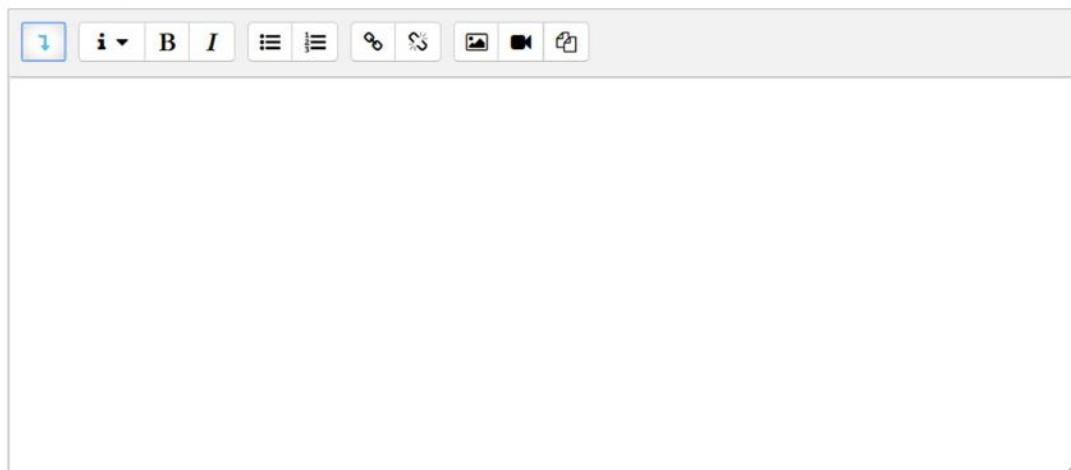


Figure 10. Atto Editor

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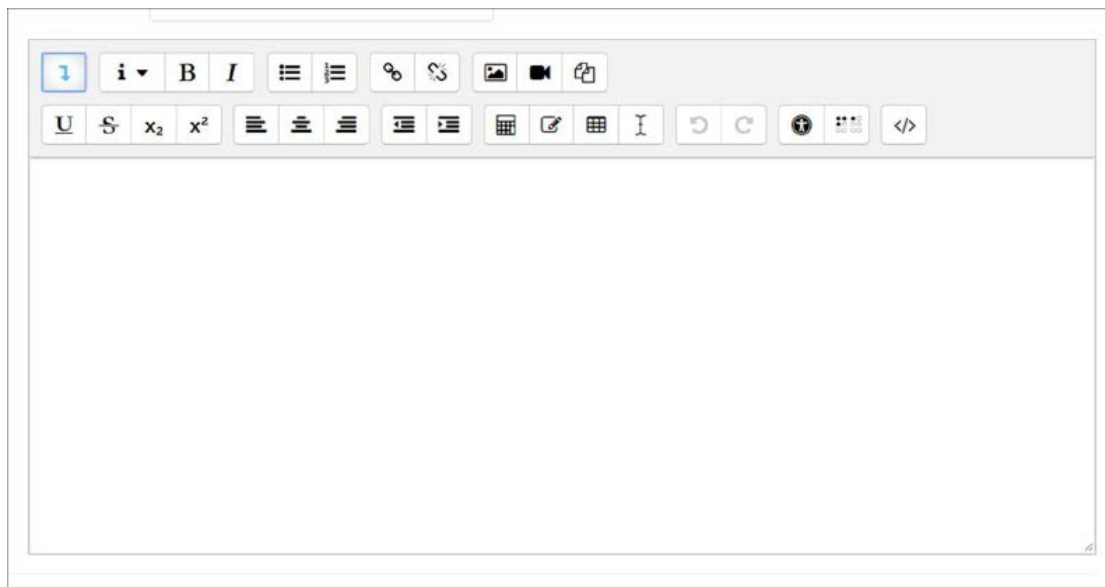


Figure 11. Atto Editor additional options

Some of the Atto Editor features are the following (moodle, 2021d):

- **Image copy and paste:** In Moodle 3.9 onwards, images can be copied from anywhere and pasted into the Atto editor. For example, you can take a screenshot, copy it to your clipboard and then paste it into the Atto editor.
- **Image drag and drop:** If your browser allows it (and if it does, you will see a message at the top of your screen when the editing is on) you can add images into the Atto editor simply by dragging them from your computer.

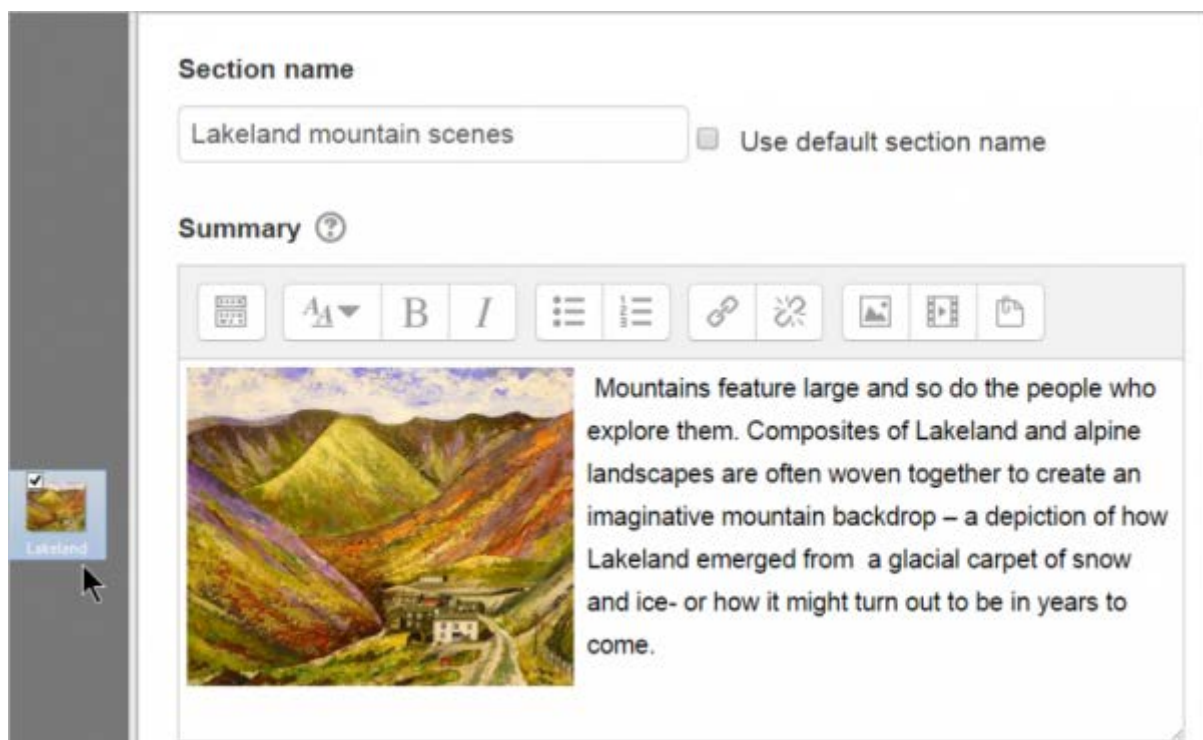


Figure 12. Drag an image directly into the editor

- **Autosave:** Text typed into the Atto editor is automatically saved if you leave the page. The default of 60 seconds may be changed by the administrator in Site administration → Plugins → Text editors → Atto HTML editor → Atto toolbar settings. If the user accidentally closes

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the tab or otherwise leaves the form without submitting, the text in the editor will be restored next time he opens the page. To discard a restored draft, the user needs to cancel the form or press the "Undo" button in the editor.

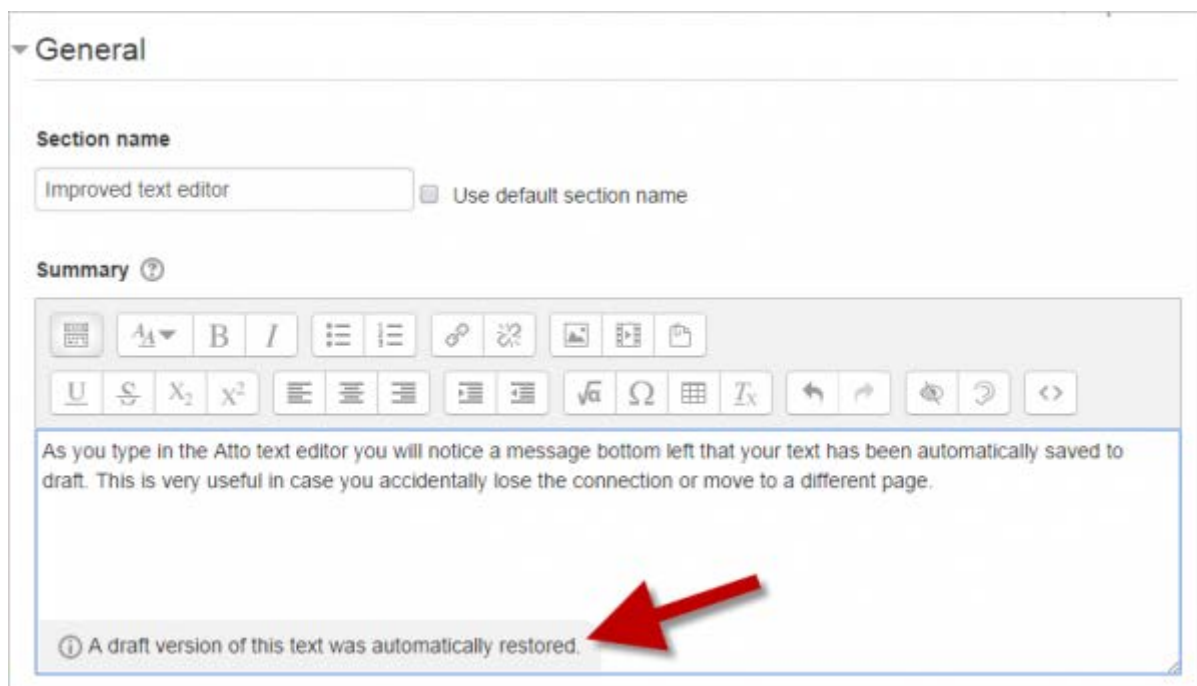


Figure 13. Autosave feature

- **Manage embedded files:** This allows users to add, delete or override files embedded in the current text area, for example in a label or topic summary. (It complements the Embedded files repository)

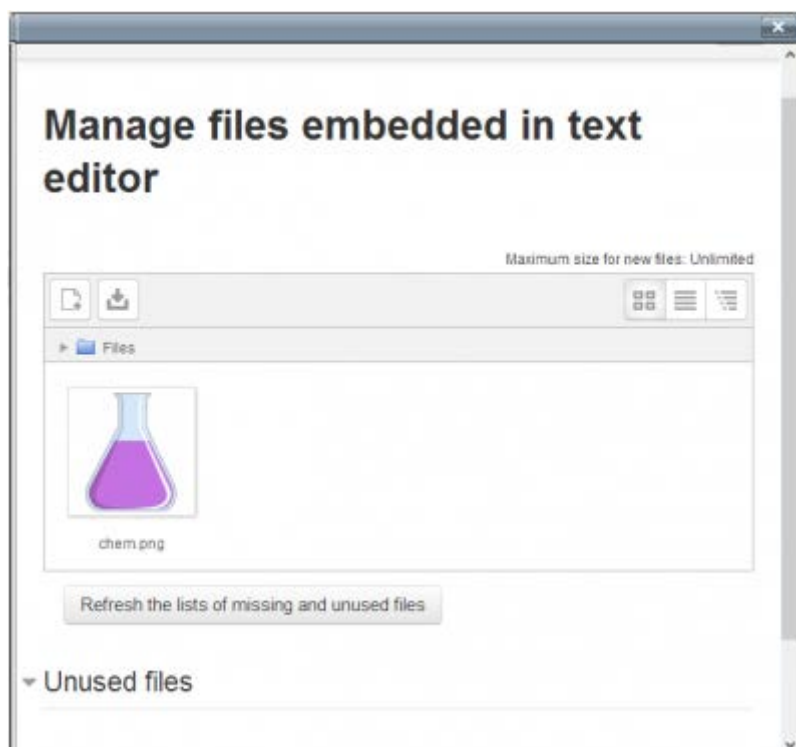


Figure 14. Manage embedded files feature

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3.3.1.1. Atto editor toolbar



Figure 15. Atto Row 1 default buttons

1. Expand
2. Style
3. Bold
4. Italic
5. Bulleted list
6. Numbered list
7. Add link
8. Unlink
9. Add image
10. Add smiley (if enabled)
11. Add media
12. Record audio
13. Record video
14. Manage embedded files
15. H5P



Figure 16. Atto Row 2 default buttons

1. Underline
2. Strikethrough
3. Subscript
4. Superscript
5. Align left/centre/right
6. Decrease/increase indent
7. Equation editor
8. Special character
9. Table
10. Clear formatting
11. Undo/redo
12. Accessibility checker
13. Screenreader helper
14. HTML/code view

3.3.1.2. Atto Editor Accessibility Checker

One of the tools available in the text editor is an automated accessibility checker which checks for some common errors in the text. These are usually things in the way the text is constructed that can

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prevent all users from having equal access to information and functionality. The list of problems that the accessibility checker looks for is (moodle, 2021w):

- Images with missing or empty alt text (unless they have decorative role and do not learning content)
- Contrast of font colour and background colour meets WCAG AA guidelines
- Long blocks of text are sufficiently broken up into headings
- All tables require captions
- Tables should not contain merged cells as they are difficult to navigate with screen readers
- All tables should contain row or column headers.

The toolbar icon is of a figure in a black circle.



Figure 17. The Accessibility Checker icon

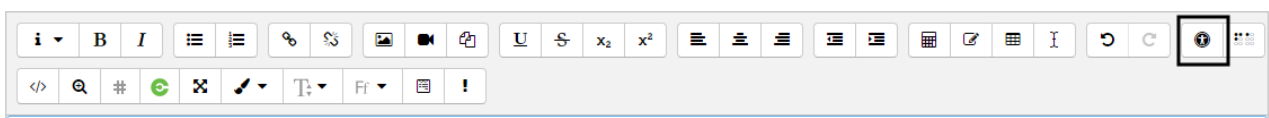


Figure 18. The Accessibility Checker icon highlighted.

The image below, shows the Accessibility Checker displaying it's results. It has identified the text and advises that "The colours of the foreground and background text do not have enough contrast. To fix this warning, change either foreground or background colour of the text so that it is easier to read" (WARWICK, 2019).

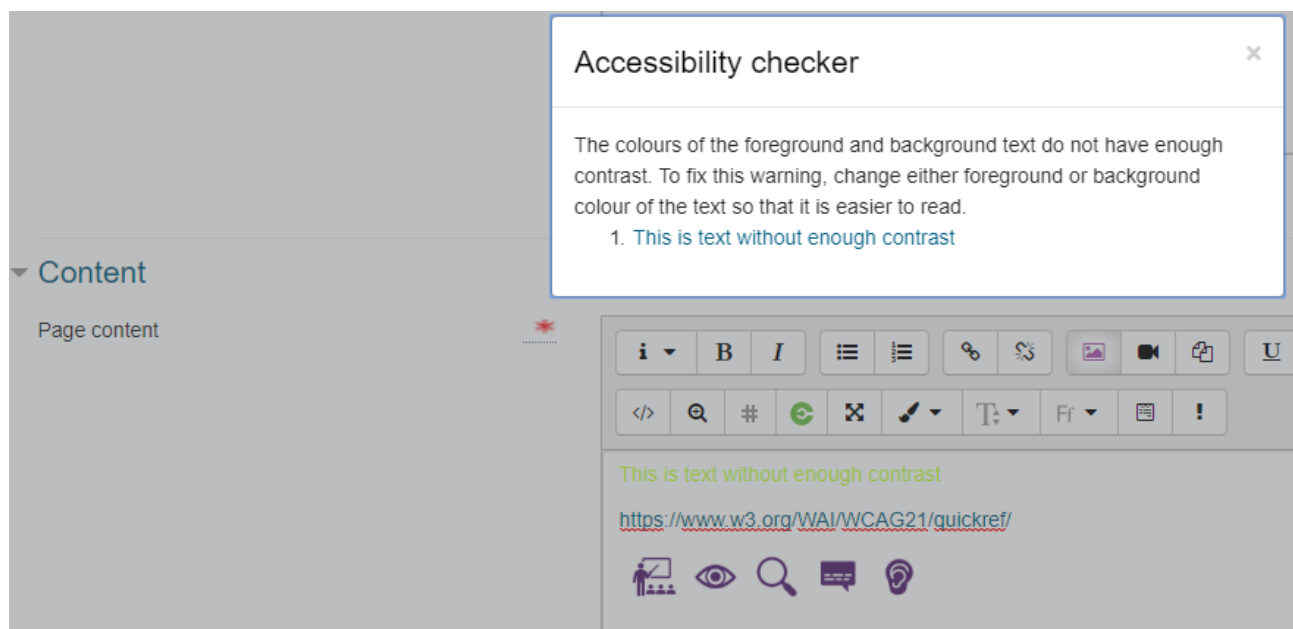


Figure 19. Atto Editor Accessibility Checker

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3.3.1.3. Text Accessibility Check

Content with an accessible hierarchy and layout will be clearer for everyone to navigate and improves their reading experience. This can be achieved following the next tips (Holland & Plana, 2018):

- Use editor headings:
 - Ensure headings are nested in sequence, e.g.: H2, H3
- Use descriptive links:
 - Instead of displaying link as <https://www.youtube.com/watch?v=XXX>, hide it behind “W3C Web Accessibility Introduction”, screen reader friendly
- Use consistent naming (each naming should correspond to the appropriate object in the content)
- Use editor lists (ordered or unordered):
 - Do not insert blank lines between list items, as this usually breaks the lists for screen reader users.

3.4. Screenreader Helper

The Screenreader Helper provides additional information about the currently selected text (e.g.: is it bold), as well as a listing any images or links in the text. The image below shows the Screenreader Helper identifying the style, links and images present in the text (WARWICK, 2019).

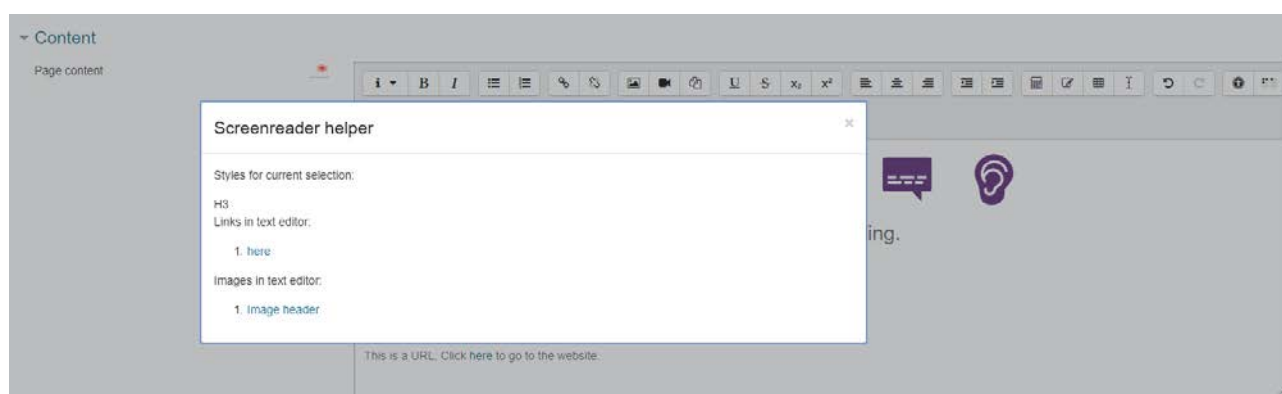


Figure 20. Screenreader Helper

3.5. Multimedia

3.5.1. Image Accessibility Check

User can add images using the editor tools, as this ensures that accessible data is prompted for. The steps that the user should follow to implement this process are the following (Holland & Plana, 2018):

- Image Alt descriptions
- Option “Description not necessary” for decorative images, e.g.: section dividers
- Navigational graphics, such as Home for instance, should have alt of “Home”, not “Little yellow house”
- Complex images, images including in-depth information, e.g.: STEM workflows, require longer text explanations alongside them (too long for alts).

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3.5.2. Multimedia Accessibility Check

Moodle comes with “video.js” with built in support for (Holland & Plana, 2018):

- Captions
- Subtitles
- Chapters
- Descriptions.

A Moodle user can add multimedia via inbuilt tools, as this ensures that accessible data is prompted for. To check the accessibility of an embedded multimedia, follow the steps below (Holland & Plana, 2018):

- Ensure delivery method, e.g.: video.js, is accessible
- Use captions and/or subtitles
- Use audio descriptions when needed, e.g.: <creak of door opening>
- Use tools, such as YouTube, to automatically produce your captions and subtitles, and check!
- Including text transcripts is very useful.

In the following window, the user enters the hyperlink that corresponds to the specific file he/she wishes to upload on the platform, by clicking on "Browse repositories...". This function is completed when the file is being uploaded on the platform, by clicking on "Insert media". Moreover, the user has the ability to enter or modify the name of the file:

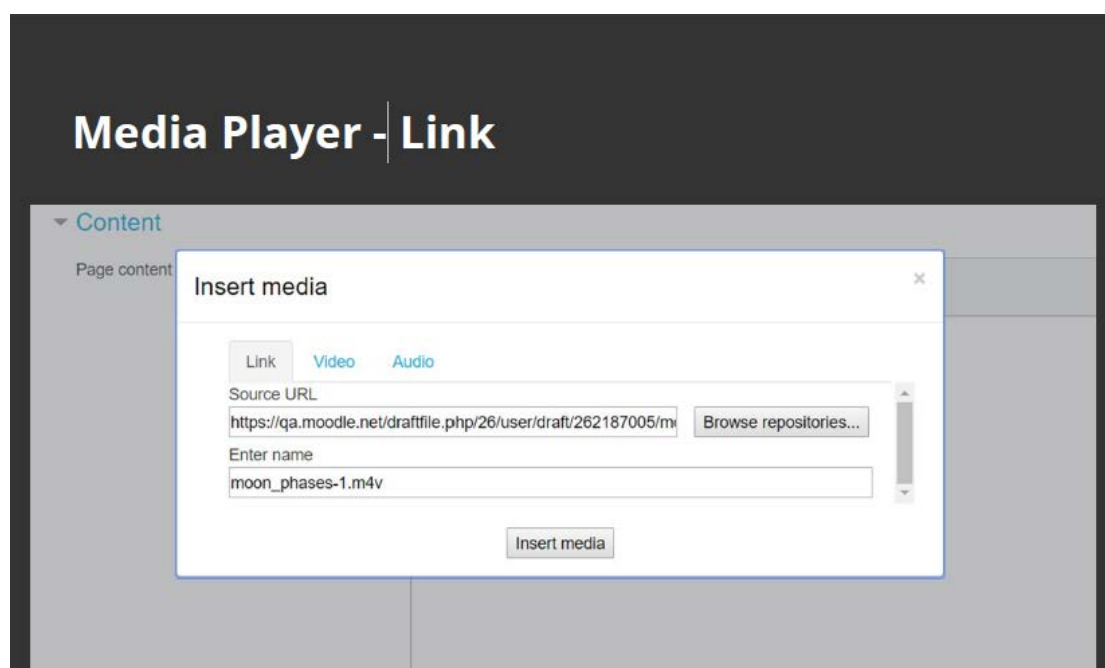


Figure 22. Insert Media – Link

In the following window, the user enters the hyperlink that corresponds to the video file he/she wishes to upload on the platform, by clicking on "Browse repositories...". This function is completed when the file is being uploaded on the platform, by clicking on "Insert media":

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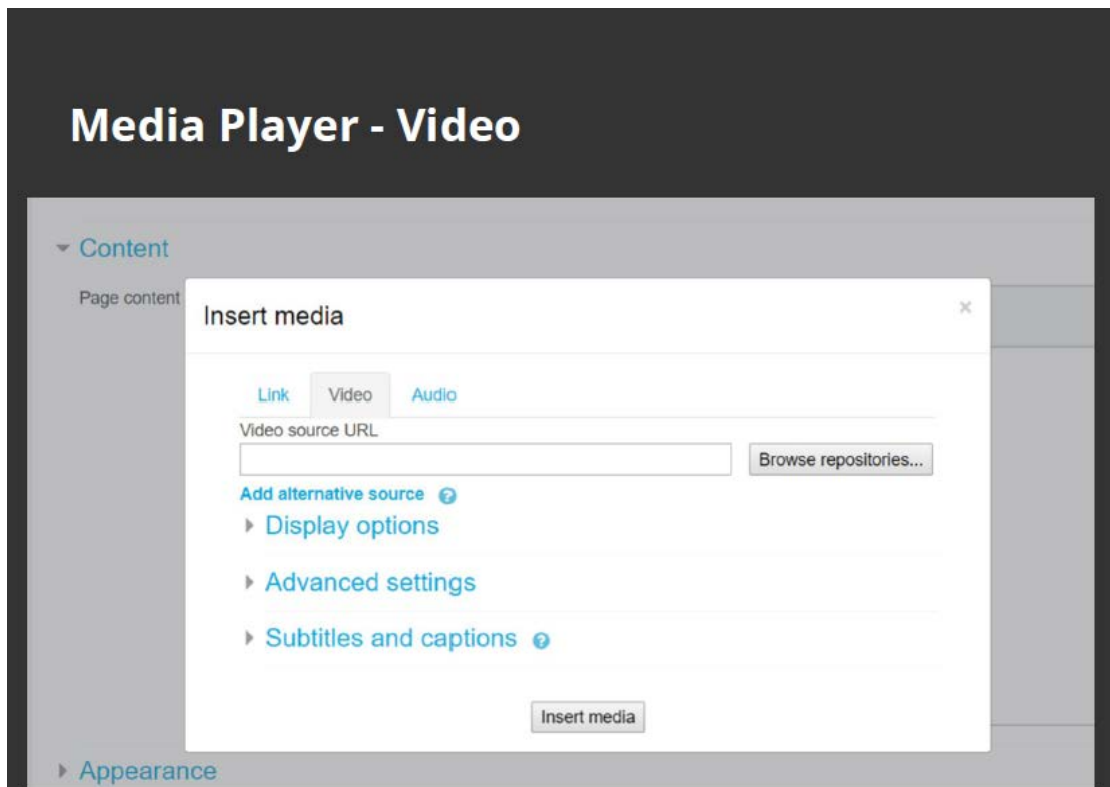


Figure 23. Insert Media – Video

In the window that follows, we can see the “Display options” where the user can set the size and the thumbnail URL, in order to modify the video file:

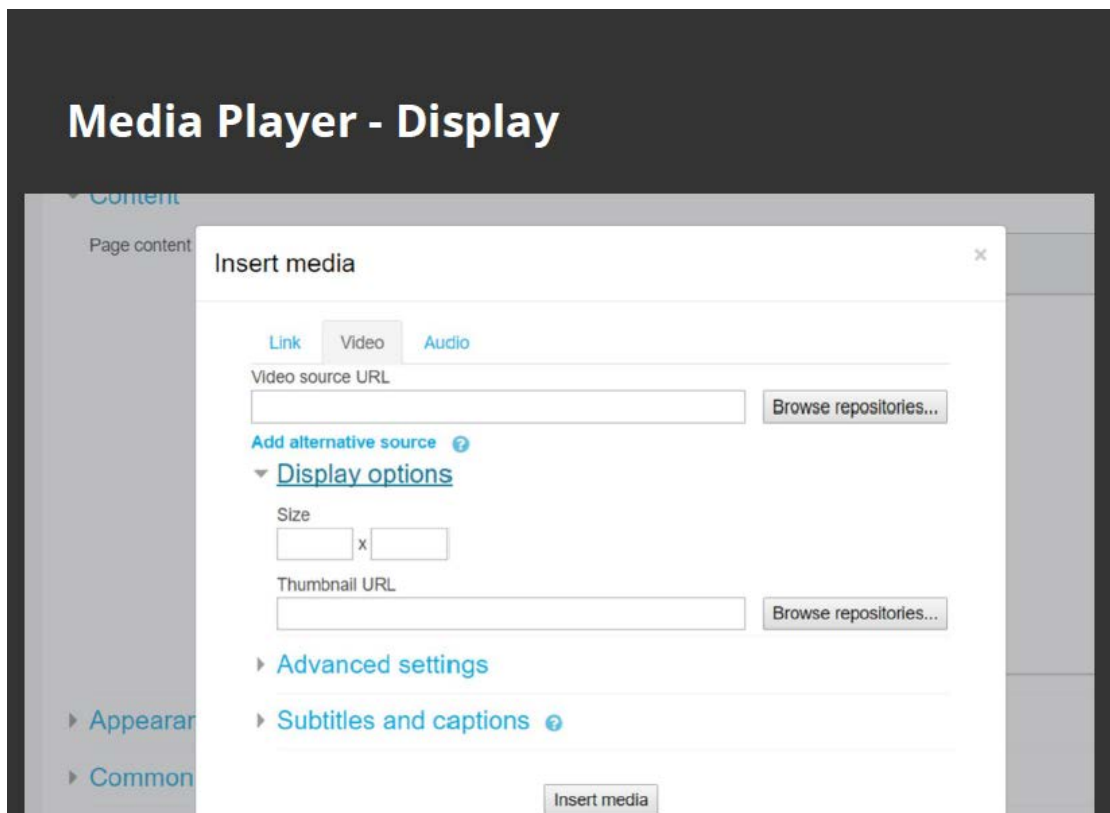


Figure 24. Insert Video - Display options

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In the window that follows, we can see the “Advanced settings” where the user can enable/disable the following settings:

- Show controls
- Play automatically
- Muted
- Loop:

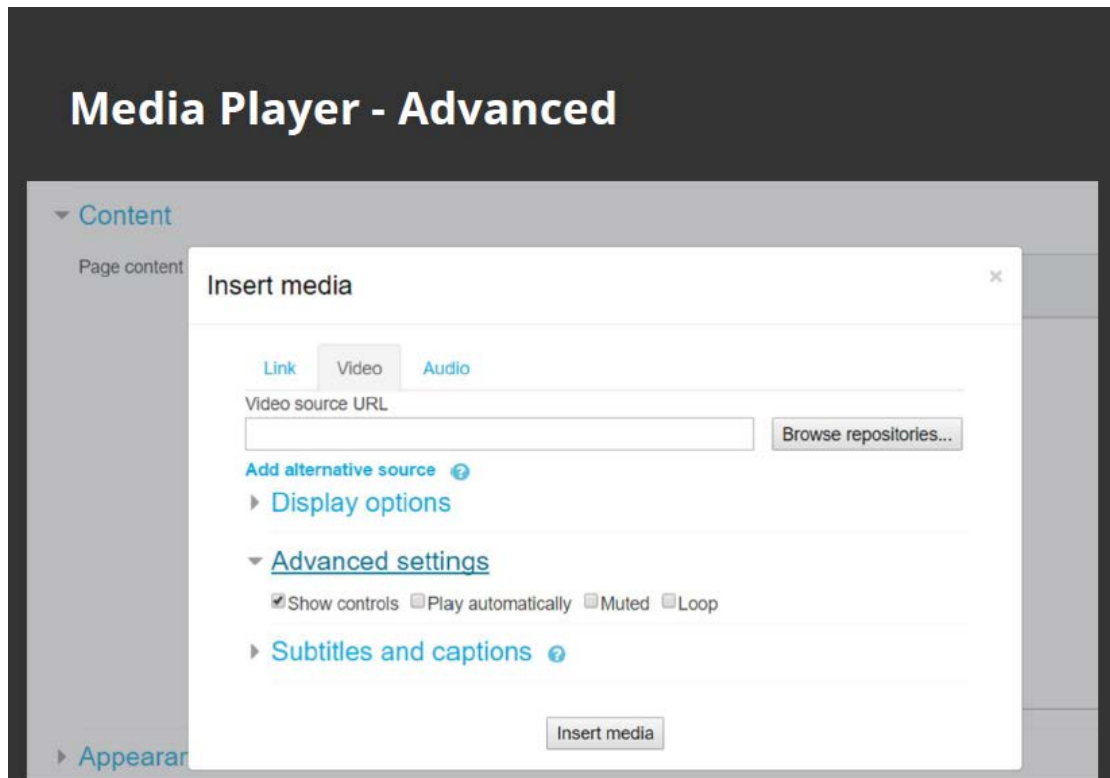


Figure 25. Insert Video - Advanced setting

In the following window, the user enters the hyperlink that corresponds to the subtitle track file he/she wishes to upload on the platform, by clicking on "Browse repositories...". Then, the user has the ability to define the language of the subtitles:

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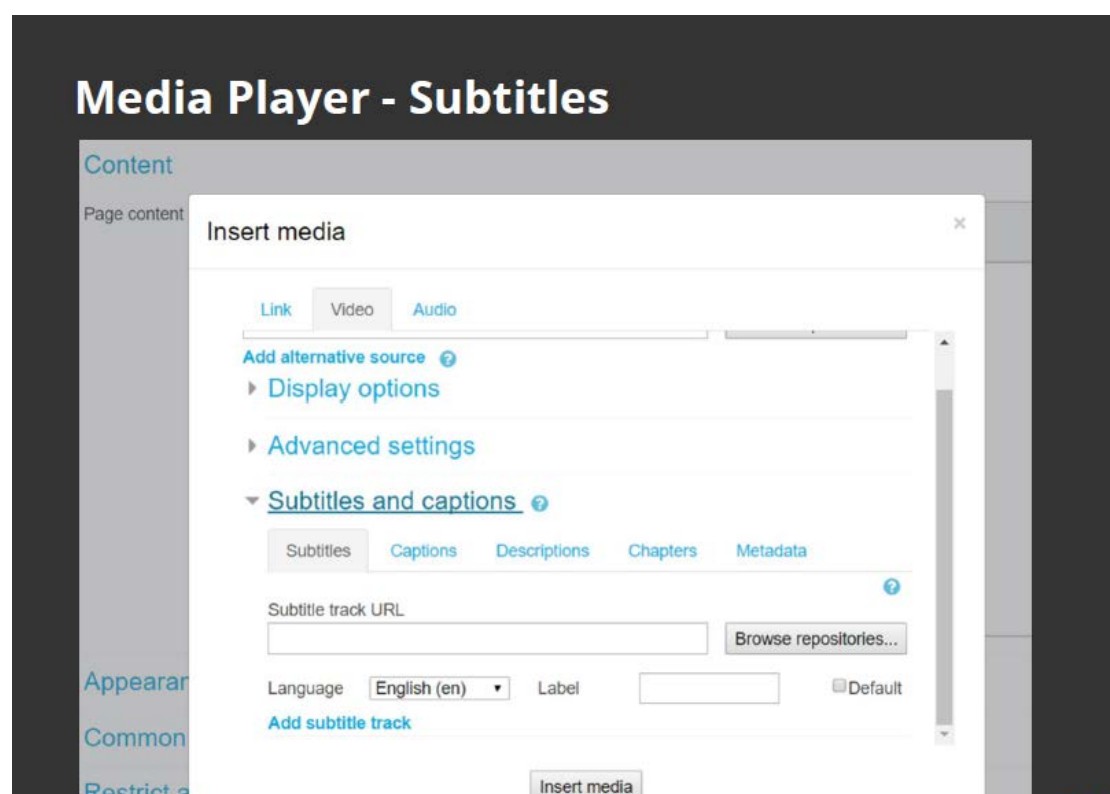


Figure 26. Insert Video - Subtitles and captions

After the abovementioned settings, the file upload can be completed, by clicking on "Insert media".

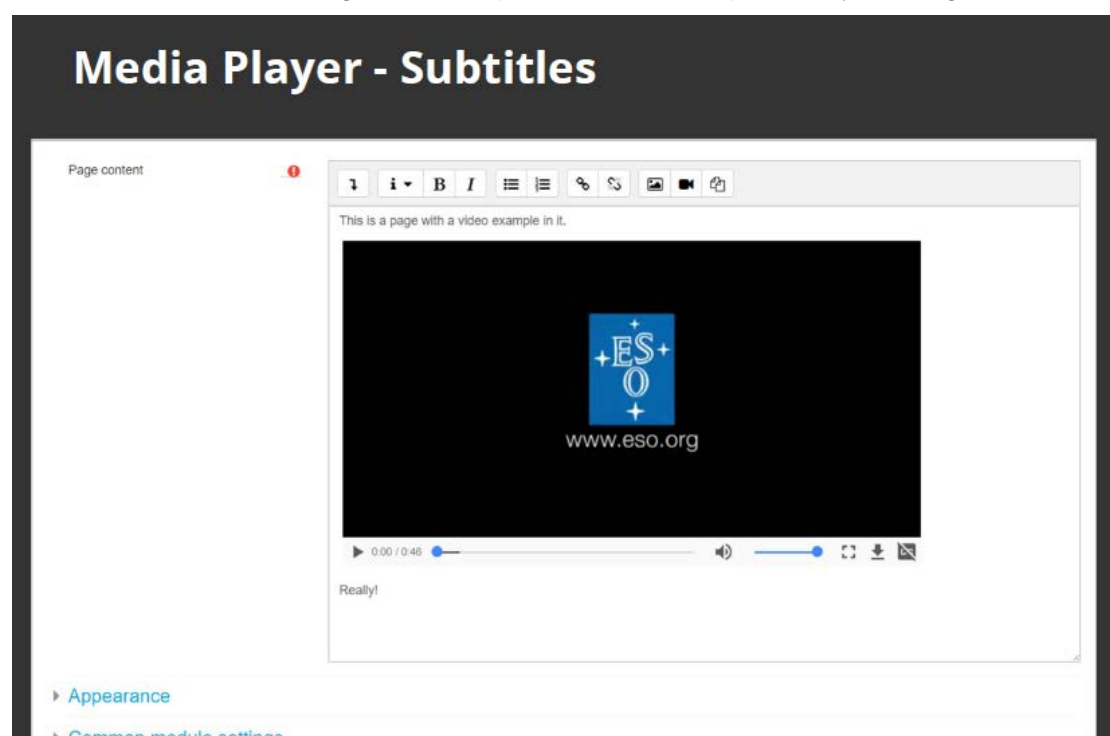


Figure 27. Insert Video – Subtitles

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3.6. Tables

If someone wants to add a table in a Moodle web page should follow the steps below (Holland & Plana, 2018):

- Keep them simple and logical
- Use captions
- Use column/row headers
- Do not merge cells
- Do not use for page layout, only for tabular data
- Do not use nested tables either.

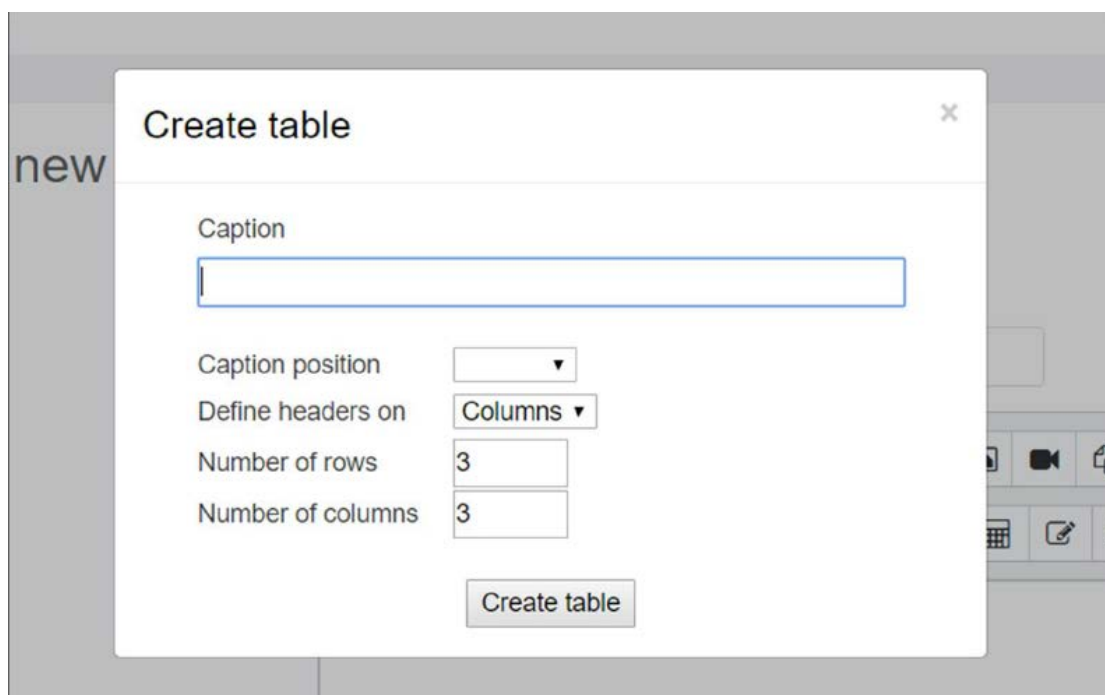


Figure 28. Create table

3.6.1. Table editor settings

Styles, colors and sizes for tables and their borders may be enabled from Administration → Site administration → Plugins → Test editors → Atto HTML editor → Table settings (moodle, 2021w).

3.7. Embedding STEM (Science, Technology, Engineering, Mathematics) object in Moodle content

STEM is a curriculum based on the idea of educating students in four specific disciplines — science, technology, engineering and mathematics — in an interdisciplinary and applied approach. Rather than teach the four disciplines as separate and discrete subjects, STEM integrates them into a cohesive learning paradigm based on real-world applications (LIVESCIENCE, 2013).

If someone wants to embed STEM objects in his/her course implemented on Moodle platform, he/she should use the Atto Equation Editor, which is an Atto Editor feature.

3.7.1. Atto Equation Editor

If either the MathJax or the TeX notation filters are enabled (in Administration Site administration → Plugins → Filters → Manage filters), then an equation editor button is provided in the toolbar for

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launching the equation editor. This editor can enrich the content with the following characteristics (moodle, 2021w):

- Feature rich editor
- Great looking equations that are fully accessible to standard accessibility applications
- Using mathjax.org to expose queries (data to be analyzed) to assistive technology.

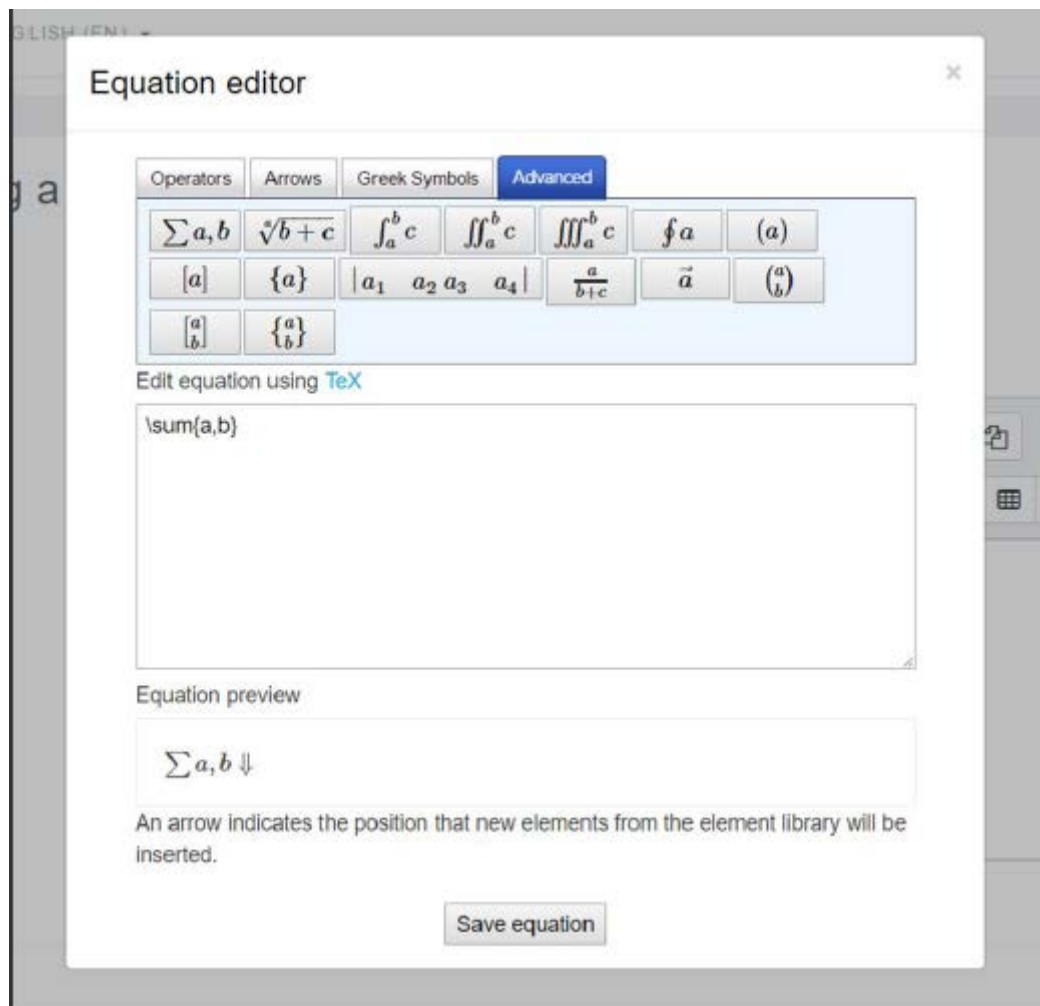


Figure 29. Equation editor

3.7.2. Equation editor settings

Equation editor commands may be removed, added or reordered in Administration → Site administration → Plugins → Text editors → Atto HTML editor → Equation editor settings (moodle, 2021w).

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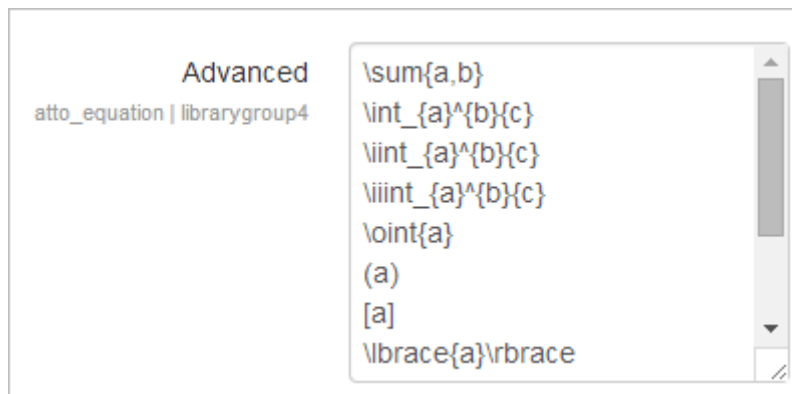


Figure 30. Equation editor settings

4. Technical features of the InSIDE Moodle platform installation

With the aim of achieving the installation of the Moodle platform, so that it can serve the number of users who were initially estimated to have access to the platform, but also to intervene by modifying it appropriately, the following installations and settings were made.

“insidemoodle.di.uoa.gr” website, where Moodle platform is installed, that corresponds to IP 195.134.65.122. The specific platform has been installed on a virtual machine (VM) on the main server (webapp.di.uoa.gr) of the Department of Informatics and Telecommunication of the National and Kapodistrian University of Athens. Referring in detail to the technical features of the main server, these are the following (CLOUDCONE Knowledge Center, 2021; DigitalOcean Community, 2021; DigitalOcean Community, 2020; moodle, 2021b; moodle, 2021d; moodle, 2021h; moodle, 2021r; moodle, 2021s; moodle, 2021t; moodle, 2021ab; moodle, 2021ac):

- Disk capacity: 250GB (for the VM)
- Memory size: from 4GB to 8GB
- Unix Software: Ubuntu 18.04.5 LTS (kernel version 4.15.0-124-generic)
- PHP version: PHP 7.2.24-0ubuntu0.18.04.7
- PHP extension: php7.2-mbstring
- MySQL version: 14.14 Distrib 5.7.32
- Apache Http Server version: 2.4.29
- Firewall polices: Configured by UFW, so as to permit SSH connections and also, HTTP connections on port 80 (hostadvice, 2021)
- phpMyAdmin (MySQL administration tool), installed in: insidemoodle.di.uoa.gr/phpMyAdmin
- Moodle version: 3.9
- Moodle server path: /var/www/html

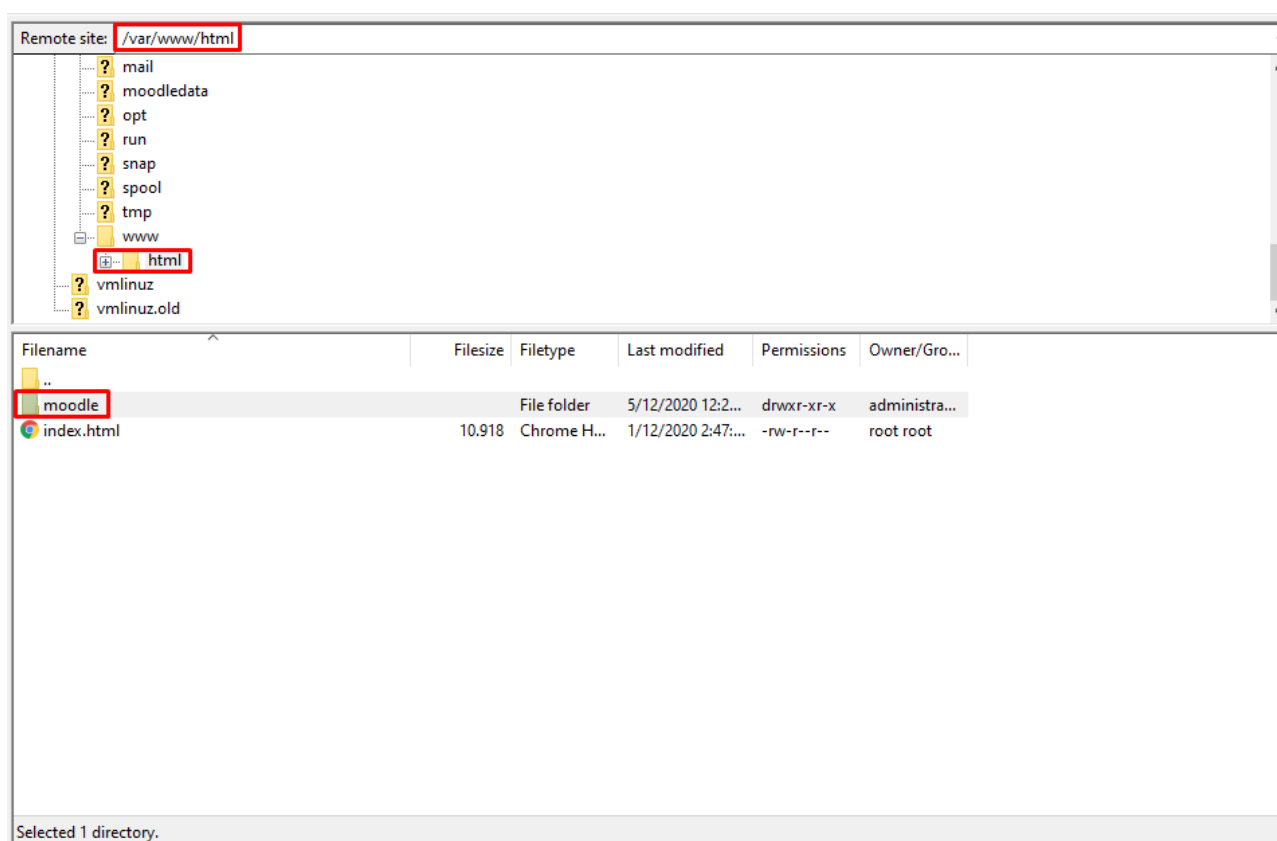


Figure 31. Moodle server path

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- Error logs path: /var/log/apache2/error.log

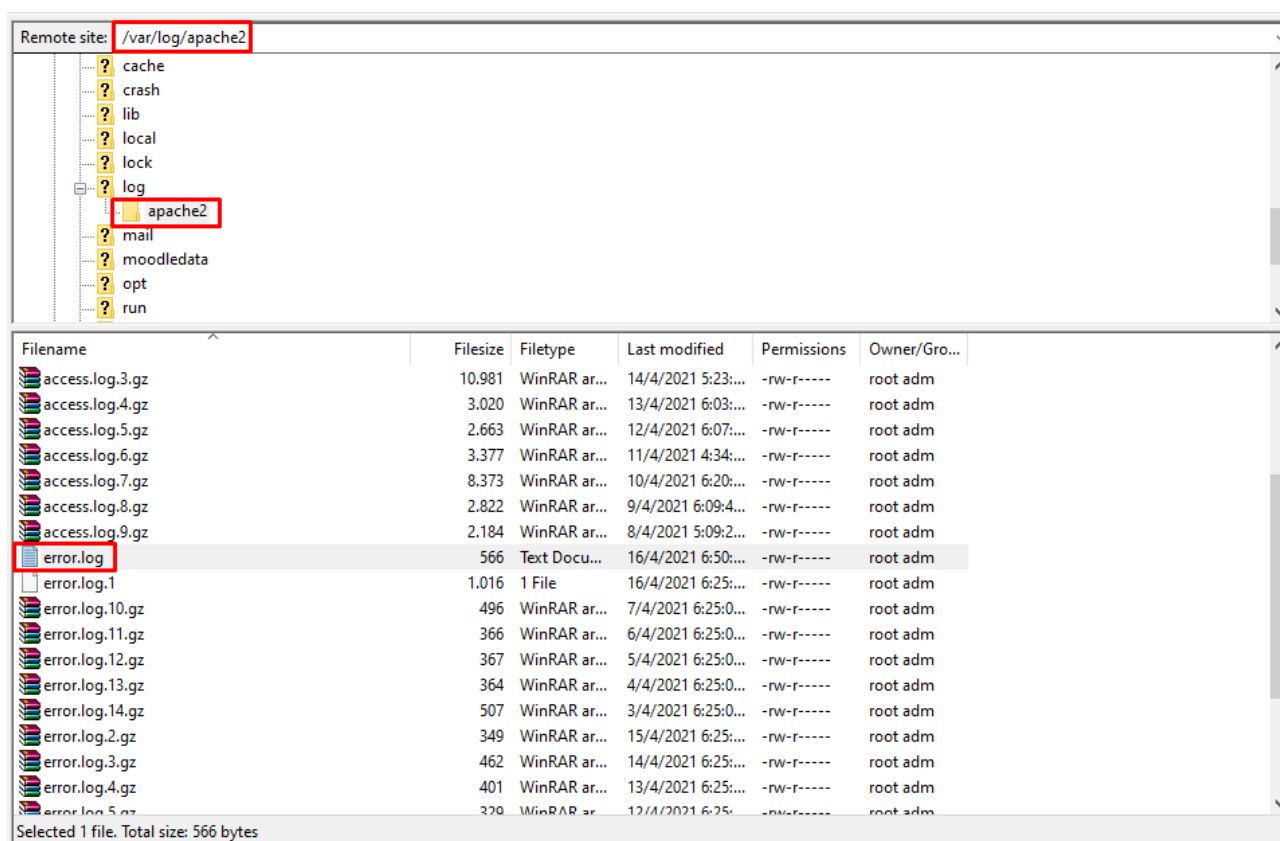


Figure 32. Error logs path

The folder “moodledata” in path “/var/moodledata” with open external permissions (777) has also been created, in order the downloads to be permitted: drwxrwxrwx 10 www-data www-data 4096 Dec 2 12:12 moodledata/

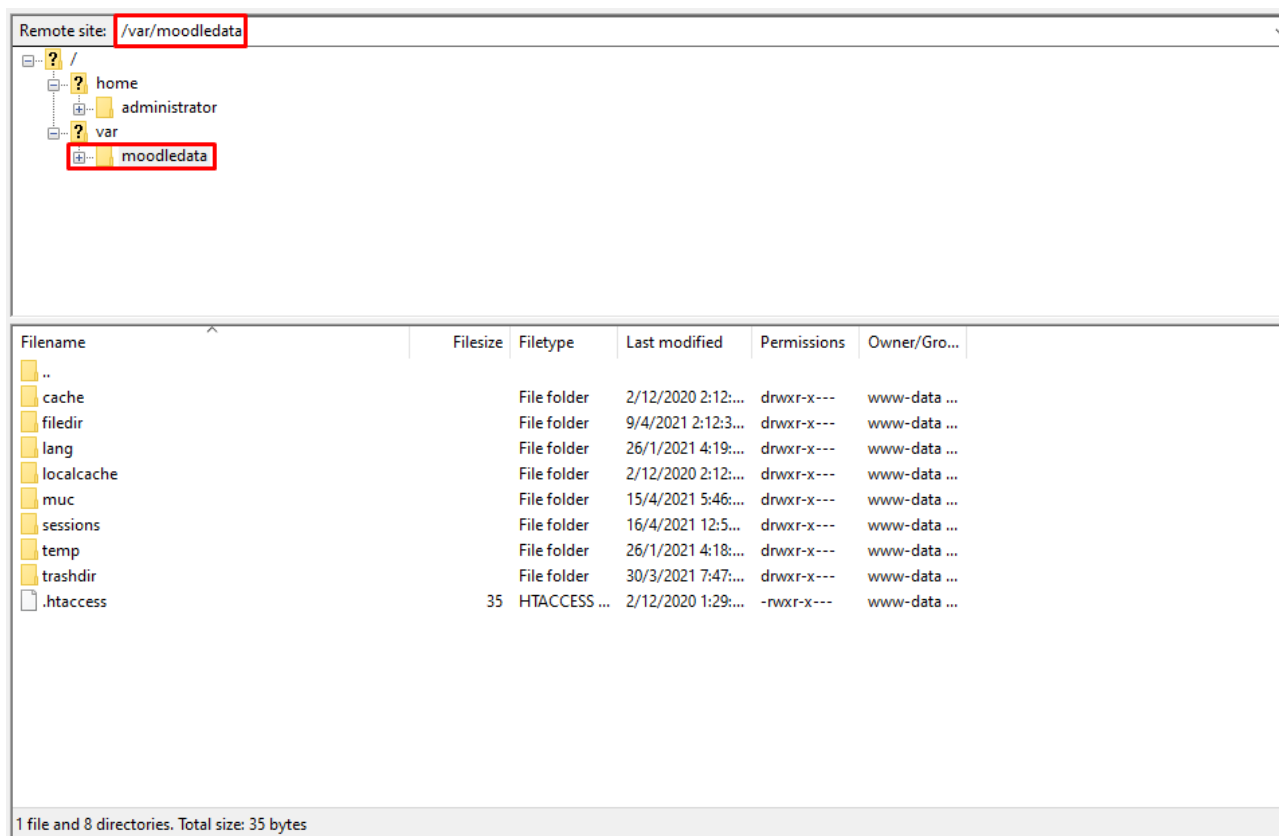


Figure 33. Moodledata path

Finally, internal downloads are set to get permission 750 for more privacy, e.g.: drwxr-x--- 7 www-data www-data 4096 Dec 2 12:11 filedir/

The connection to the virtual machine "insidemoodle.di.uoa.gr" can be realized by using SSH (e.g.: PuTTY) or FTP (e.g.: FileZilla).

5. Modification of Moodle to improve its accessibility

The main contribution of the InSIDE UOA project team for the abovementioned improvement consists of two parts. The first one is the implementation of a webpage which is named “[Instructions for Creating Accessible Files](#)” and contains instructions for creating accessible files (see [Appendix 3-10](#)). On this website, the scientific team has created internal webpages, which correspond to the three categories of instructions:

- Documents: [Quick guidelines for creating accessible documents](#)
- Presentations: [Quick guidelines for creating accessible presentations](#)
- Video / Audio: [Quick guidelines for creating accessible video/audio files](#)

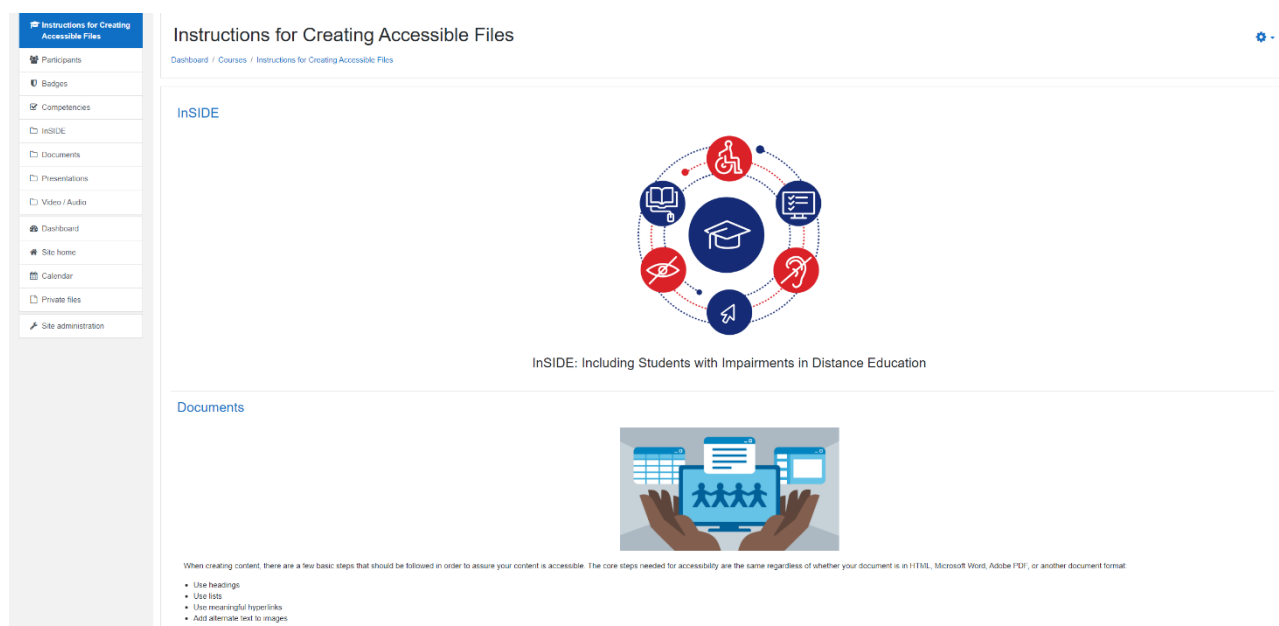


Figure 34. Instructions for Creating Accessible Files – Webpage – Documents

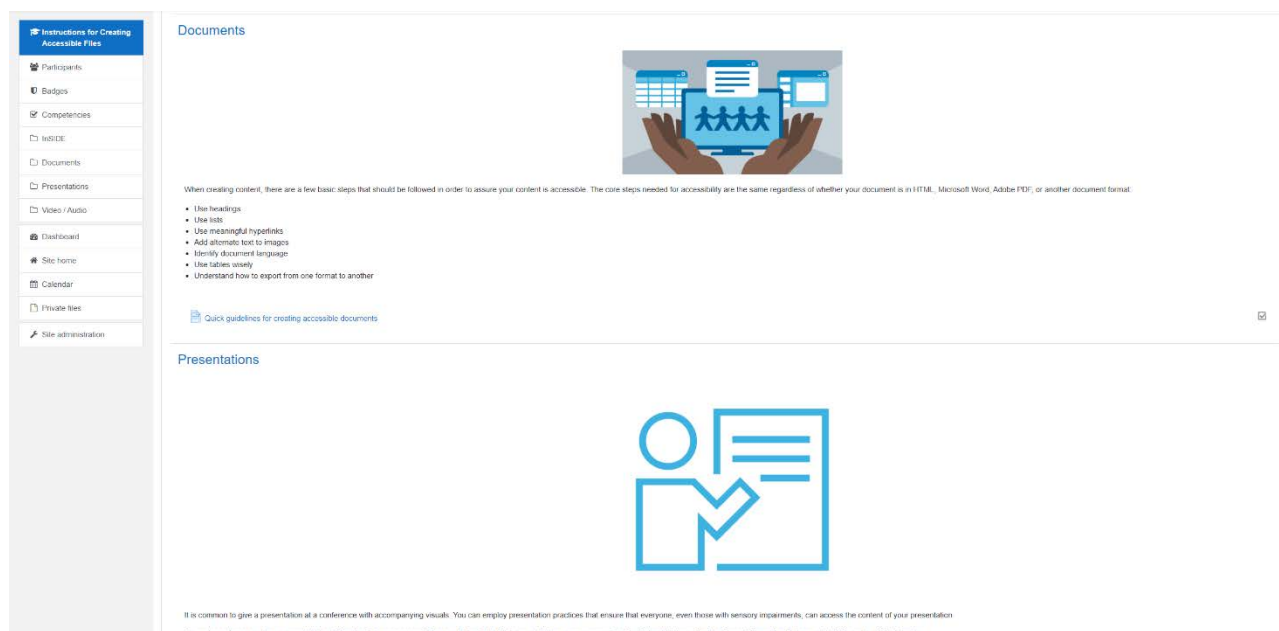


Figure 35. Instructions for Creating Accessible Files – Webpage – Presentations

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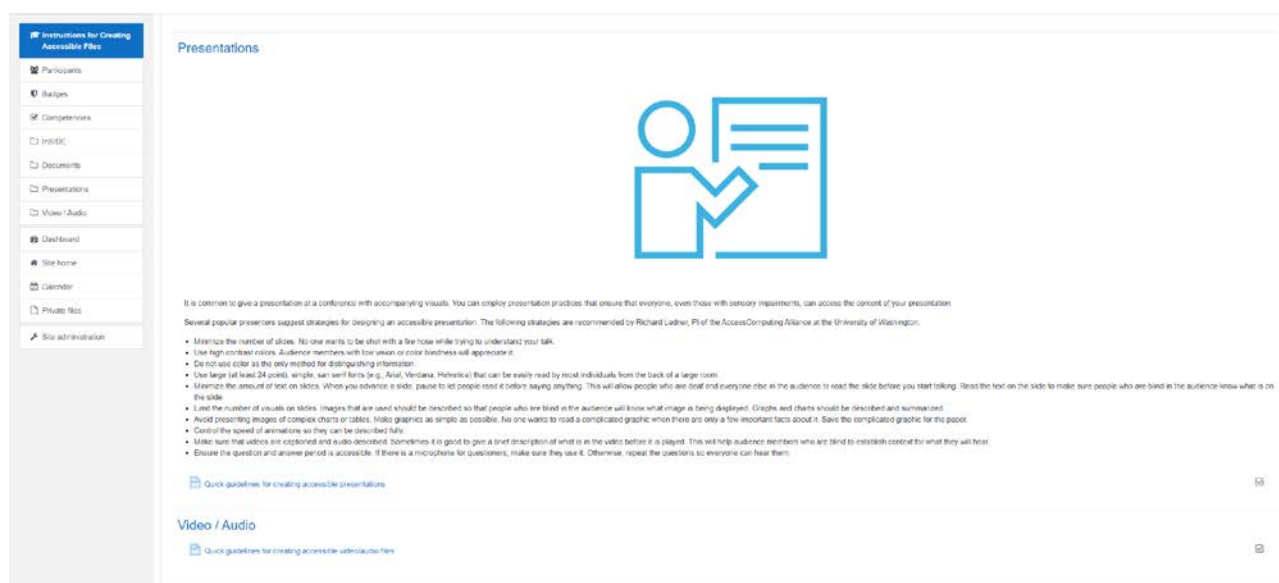


Figure 36. Instructions for Creating Accessible Files – Webpage - Video/Audio

In these webpages the InSIDE UOA project team embedded guidelines for creating accessible documents, presentations and video/audio files created by the members of the team.

Additionally, the scientific team has set the opening of each instruction file so that it opens in a new tab. This facilitates the user, because it allows him to modify his files in an accessible way, while being consulted by the relevant instructions, created in the context of this intervention.

The access to the main webpage is possible from the custom menu, which was created in the upper left part of the [website](#), as well as from "Site home", and from the accessibility warning message links; the accessibility warning utility and description will be presented below.

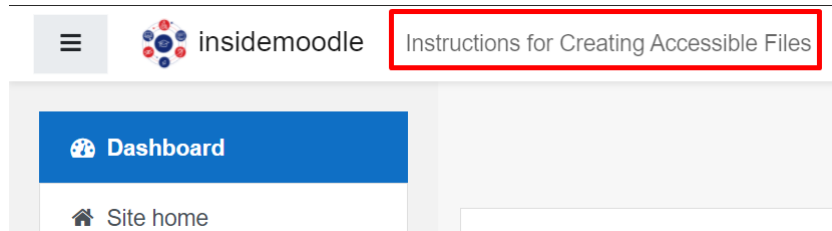


Figure 37. Access to the main accessibility webpage from the custom menu item

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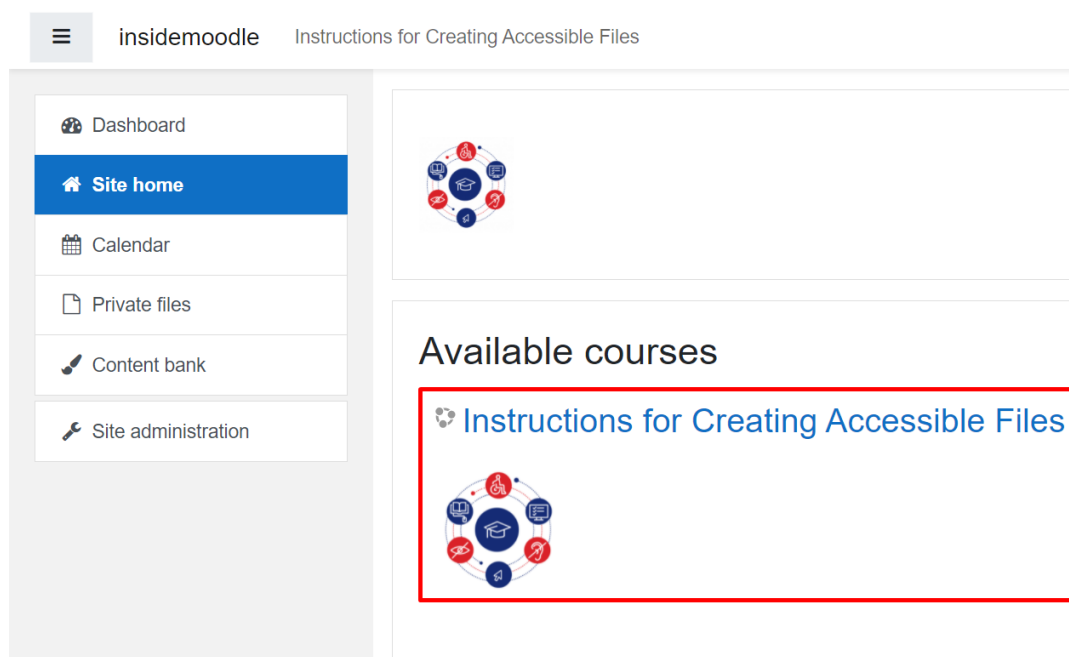


Figure 38. Access to the main accessibility webpage from the "Site home"

The second part of the main intervention created by the the InSIDE UOA project team is the addition of an accessibility warning message at all points that the user has the ability to upload a file. The scientific team has made a research on possible scenarios in which a file can be uploaded, identifying the activities and the resources where this process is feasible.

5.1. Process of creating the webpages with the guidelines for creating accessible documents (see [Appendix 3-10](#))

First of all, the InSIDE UOA project team created guidelines for creating accessible various formats of documents and presentations. Then, these guidelines converted into PDF and moreover, they have been added into separate webpages, based on the specific category of each guidelines using the page module that enables someone to create a web page resource using the text editor. A page can display text, images, sound, video, web links and embedded code, such as Google maps. The advantages of using the page module rather than the file module include the resource being more accessible (for example to users of mobile devices) and easier to update.

Below, there are some screenshots of the content addition and editing process using the "Atto Editor" for creating the abovementioned guidelines.

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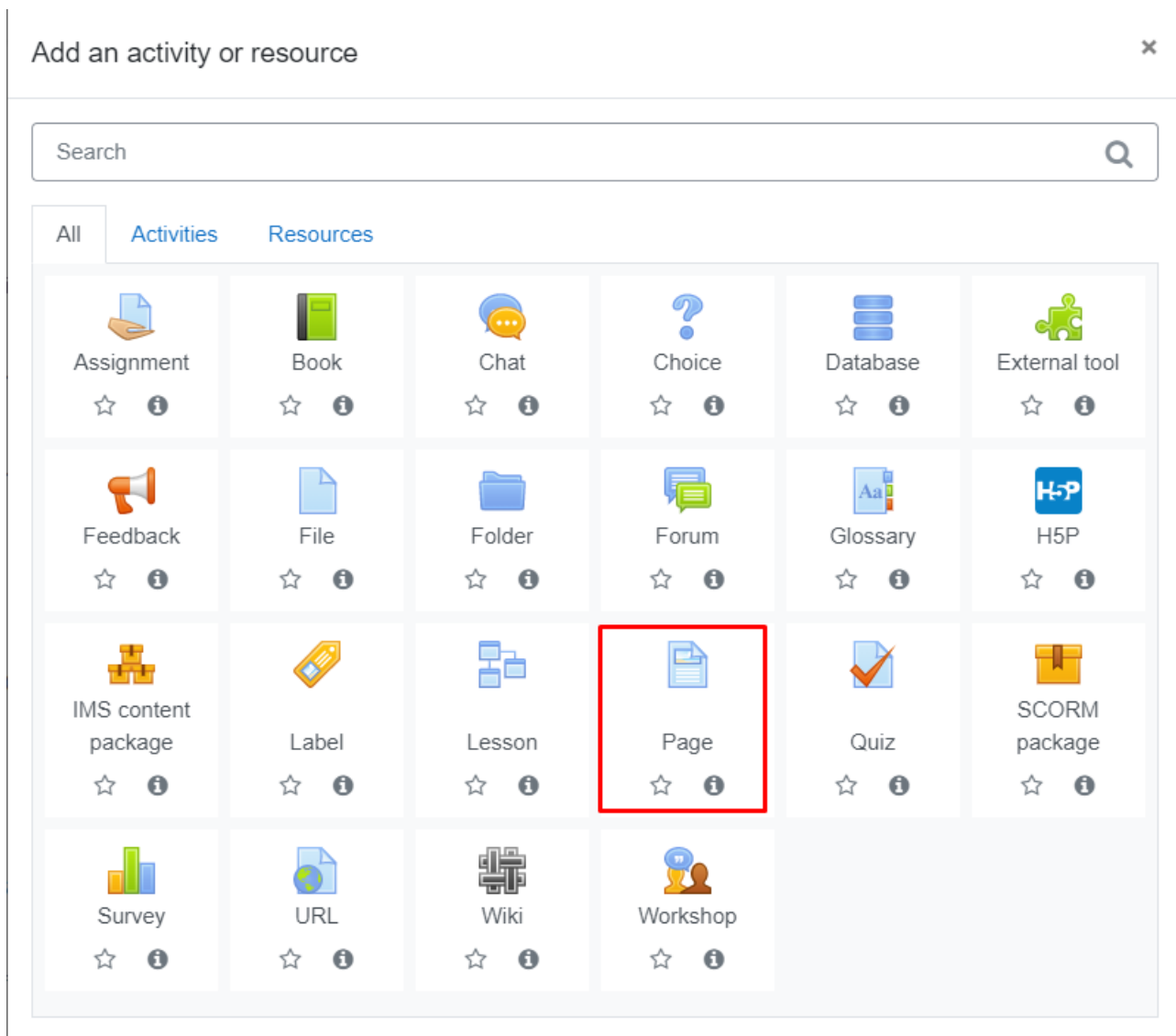


Figure 39. The Page Module

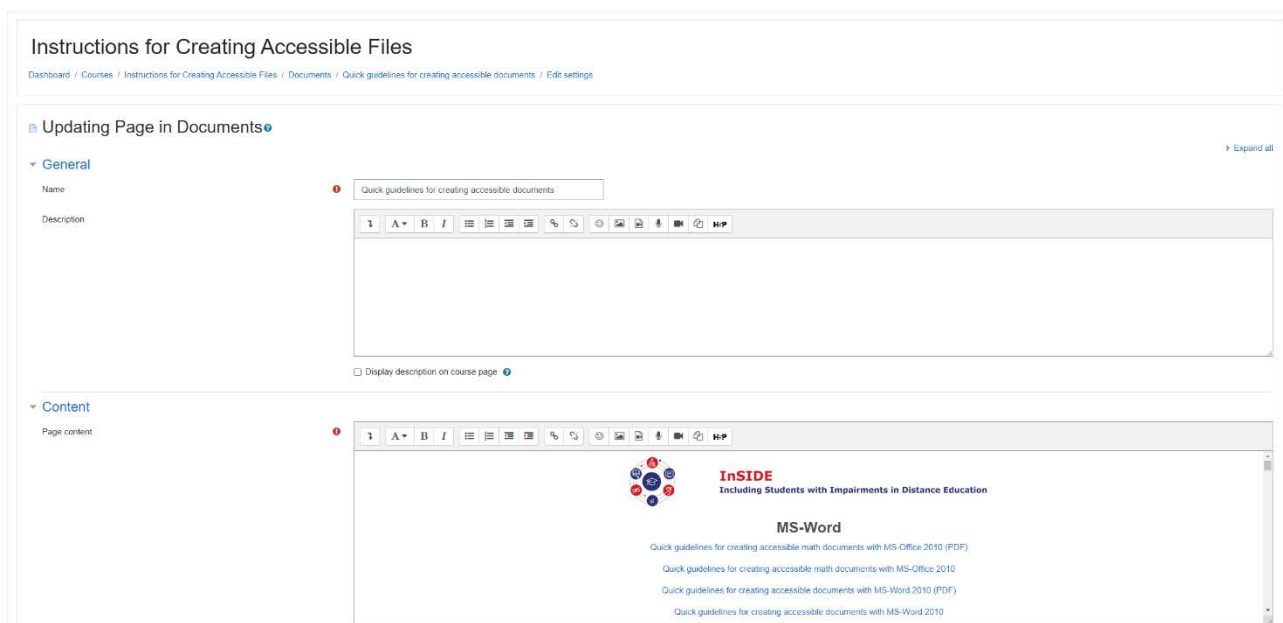


Figure 40. The editing page for adding the guidelines for creating accessible documents

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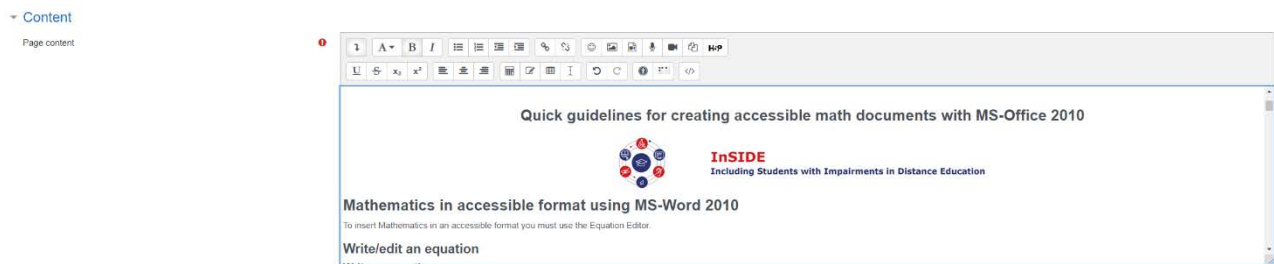


Figure 41. The editing of the content section for adding the guidelines for creating accessible documents

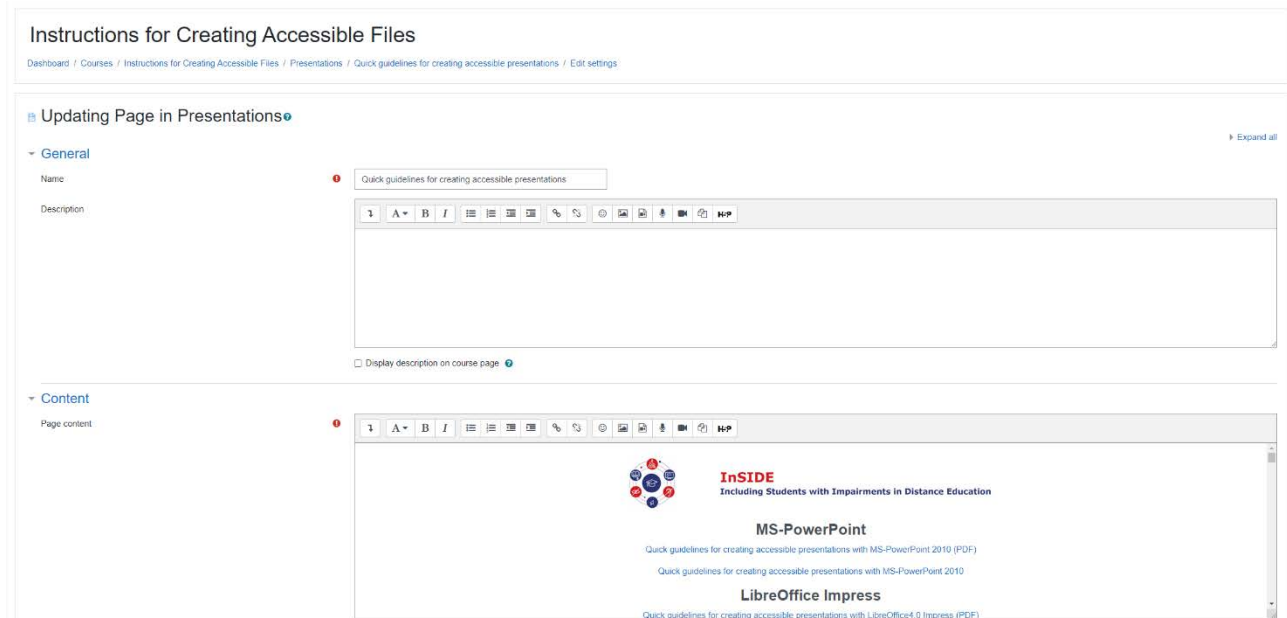


Figure 42. The editing page for adding the guidelines for creating accessible presentations

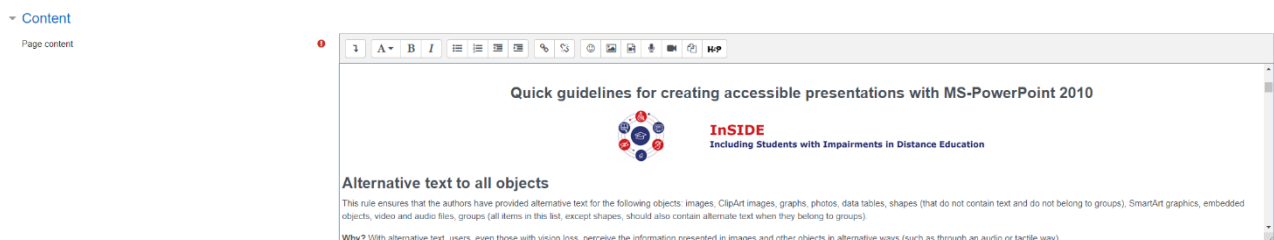


Figure 43. The editing of the content section for adding the guidelines for creating accessible presentations

5.2. Accessibility Warning

In the Accessibility warning, the InSIDE UOA project team has added the categories of instructions in the form of buttons with links to the corresponding webpages that contain the instructions of each accessibility file creation category.

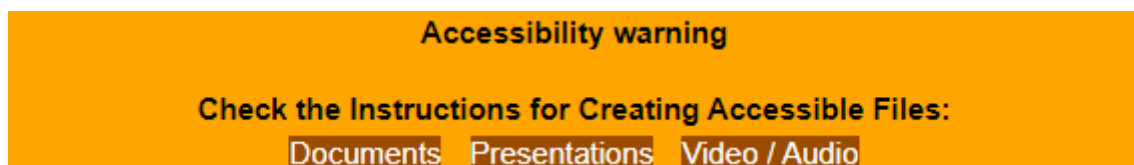


Figure 44. The accessibility warning message

The scientific team has set the webpage to open in a separate tab, so that the form stands by for the user to upload an accessible file.

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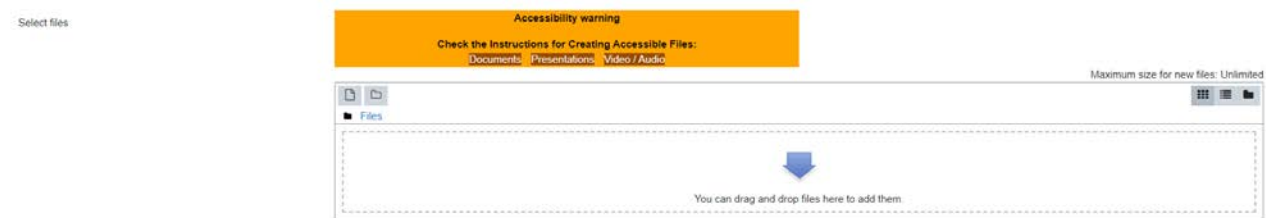


Figure 45. The accessibility warning message in the upload file manager field

```
<div style="background-color:orange; width:50%; font-family:Arial; text-align:center;">
  <span style="color:black;">
    <p> <strong> Accessibility warning </strong> </p>
    <strong> Check the Instructions for Creating Accessible Files: <br> </strong>
    <a href="http://insidemoodle.di.uoa.gr/mod/page/view.php?id=70" target="_blank" style="color:white; background-color:#994C00; margin-right: 10px;">Documents</a>
    <a href="http://insidemoodle.di.uoa.gr/mod/page/view.php?id=71" target="_blank" style="color:white; background-color:#994C00; margin-right: 10px;">Presentations</a>
    <a href="http://insidemoodle.di.uoa.gr/mod/page/view.php?id=68" target="_blank" style="color:white; background-color:#994C00;">Video / Audio</a>
  </span>
</div>
```

Figure 46. The code for creating the accessibility warning message

Trying to struct the final version of the accessibility warning message, the InSIDE UOA project team performed the following tests:

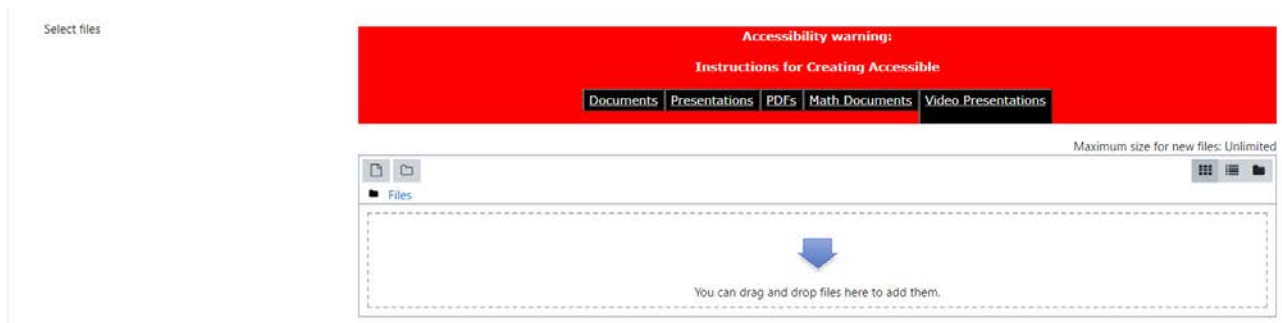


Figure 47. The accessibility warning message - Version 1

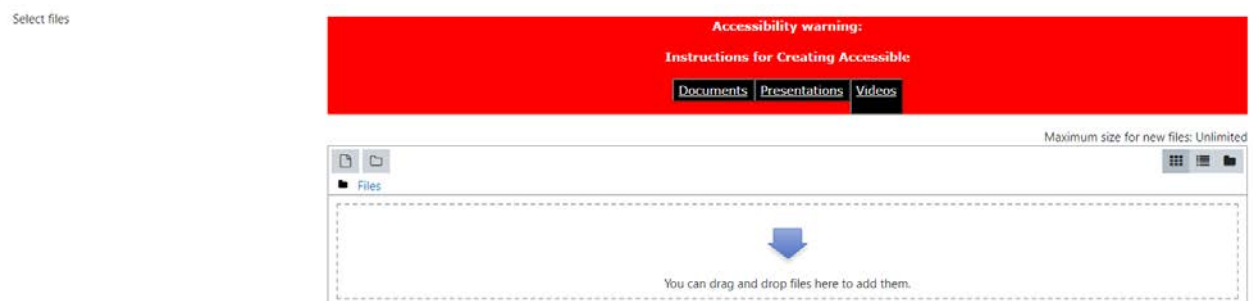


Figure 48. The accessibility warning message - Version 2

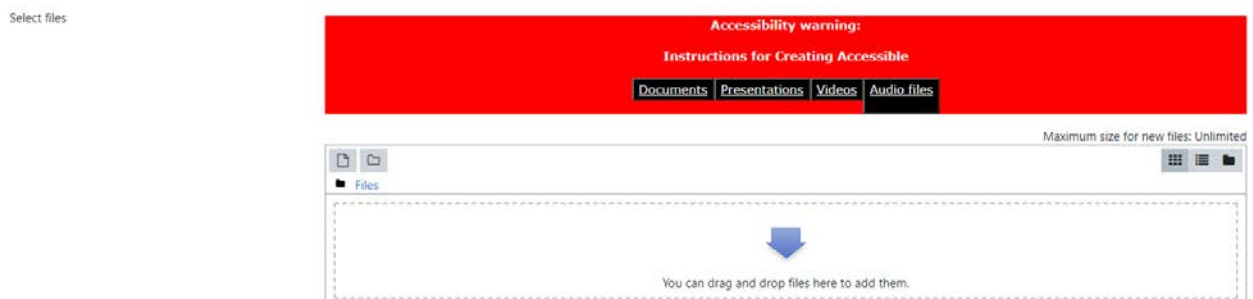


Figure 49. The accessibility warning message - Version 3

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Select files

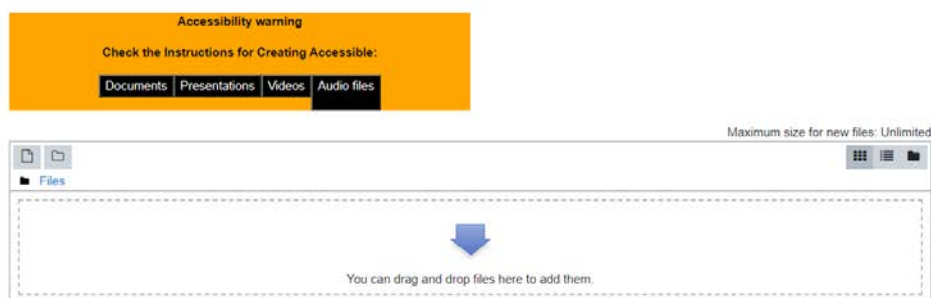


Figure 50. The accessibility warning message - Version 4

Select files

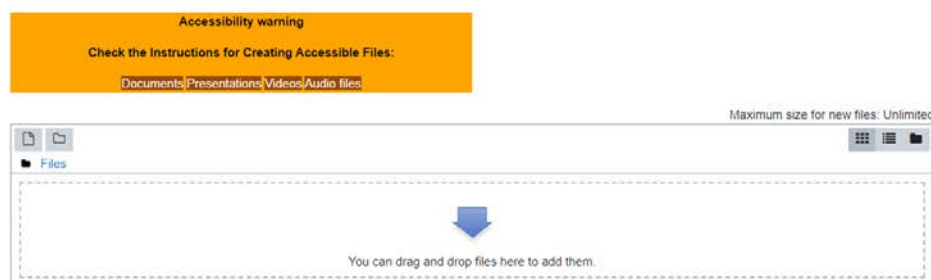


Figure 51. The accessibility warning message - Version 5

The intervention carried out by the InSIDE UOA project team affects the operation of those of the Moodle Activities and Resources through which a file can be uploaded. All the Moodle Activities and Resources are presented in detail in the next section.

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5.3. Moodle Activities & Resources

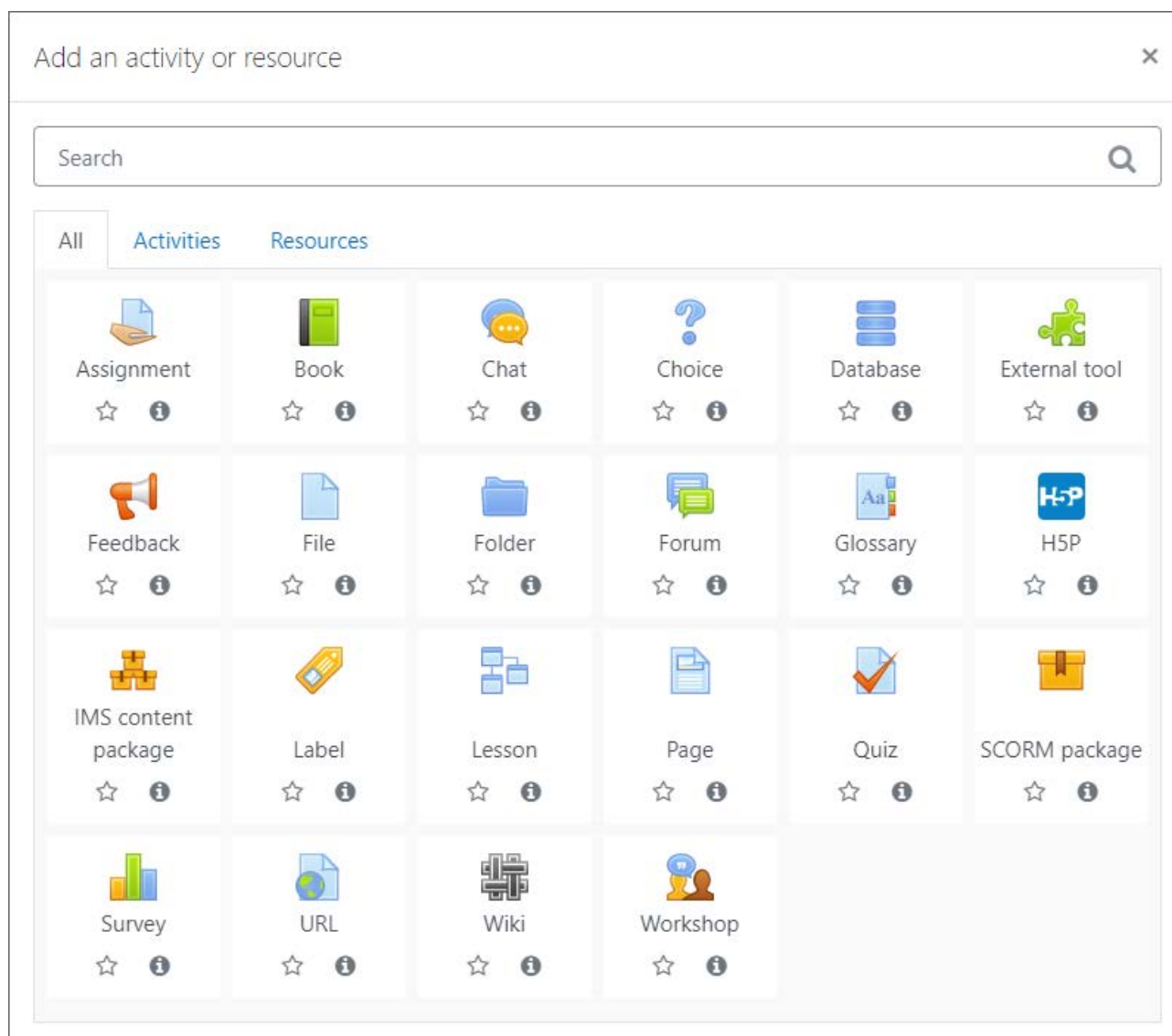


Figure 52. Moodle Activities & Resources

5.3.1. Activities

An activity is a general name for a group of features in a Moodle course. Usually, an activity is something that a student will do that interacts with other students and or the teacher.

In Moodle terminology, an Activity, such as Forums or Quizzes, properly means something students can contribute to directly, and is often contrasted to a Resource such as a File or Page, which is presented by the teacher to them. However, the term activity is sometimes for convenience also used to refer to both Activities and Resources as a group.

There are 14 different types of activities in the standard Moodle that can be found when the editing is turned on and the link 'Add an activity or resource' is clicked (moodle, 2021a).

5.3.1.1. Assignments

The assignment activity module enables a teacher to communicate tasks, collect work and provide grades and feedback.

Students can submit any digital content (files), such as word-processed documents, spreadsheets, images, or audio and video clips. Alternatively, or in addition, the assignment may require students

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to type text directly into the text editor. An assignment can also be used to remind students of 'real-world' assignments they need to complete offline, such as art work, and thus not require any digital content. Students can submit work individually or as a member of a group.

When reviewing assignments, teachers can leave feedback comments and upload files, such as marked-up student submissions, documents with comments or spoken audio feedback. Assignments can be graded using a numerical or custom scale or an advanced grading method such as a rubric. Final grades are recorded in the gradebook (moodle, 2021c).

5.3.1.2. Chat

The chat activity module enables participants to have text-based, real-time synchronous discussions.

The chat may be a one-time activity or it may be repeated at the same time each day or each week. Chat sessions are saved and can be made available for everyone to view or restricted to users with the capability to view chat session logs.

Chats are especially useful when the group chatting is not able to meet face-to-face, such as (moodle, 2021f):

- Regular meetings of students participating in online courses to enable them to share experiences with others in the same course but in a different location
- A student temporarily unable to attend in person chatting with their teacher to catch up with work
- Students out on work experience getting together to discuss their experiences with each other and their teacher
- Younger children using chat at home in the evenings as a controlled (monitored) introduction to the world of social networking
- A question and answer session with an invited speaker in a different location
- Sessions to help students prepare for tests where the teacher, or other students, would pose sample questions

5.3.1.3. Choice

The choice activity module enables a teacher to ask a single question and offer a selection of possible responses.

Choice results may be published after students have answered, after a certain date, or not at all. Results may be published with student names or anonymously (though teachers always see student names and their responses).

A choice activity may be used (moodle, 2021g):

- As a quick poll to stimulate thinking about a topic
- To quickly test students' understanding
- To facilitate student decision-making, for example allowing students to vote on a direction for the course

5.3.1.4. Database

The database activity module enables participants to create, maintain and search a collection of entries (e.g.0: records). The structure of the entries is defined by the teacher as a number of fields. Field types include checkbox, radio buttons, drop-down menu, text area, URL, picture and uploaded file.

The visual layout of information when listing, viewing or editing database entries may be controlled by database templates. Database activities may be shared between courses as presets and a teacher may also import and export database entries.

If the database auto-linking filter is enabled, any entries in a database will be automatically linked where the words or phrases appear within the course.

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A teacher can allow comments on entries. Entries can also be rated by teachers or students (peer evaluation). Ratings can be aggregated to form a final grade which is recorded in the gradebook.

Database activities have many uses, such as (moodle, 2021h):

- A collaborative collection of web links, books, book reviews, journal references etc.
- For displaying student-created photos, posters, websites or poems for peer comment and review.

5.3.1.5. Feedback

The feedback activity module enables a teacher to create a custom survey for collecting feedback from participants using a variety of question types including multiple choice, yes/no or text input.

Feedback responses may be anonymous if desired, and results may be shown to all participants or restricted to teachers only. Any feedback activities on the site front page may also be completed by non-logged-in users.

Feedback activities may be used (moodle, 2021j):

- For course evaluations, helping improve the content for later participants
- To enable participants to sign up for course modules, events etc.
- For guest surveys of course choices, school policies etc.
- For anti-bullying surveys in which students can report incidents anonymously

5.3.1.6. Forum

The forum activity module enables participants to have asynchronous discussions i.e.: discussions that take place over an extended period of time.

There are several forum types to choose from, such as a standard forum where anyone can start a new discussion at any time; a forum where each student can post exactly one discussion; or a question and answer forum where students must first post before being able to view other students' posts. A teacher can allow files to be attached to forum posts. Attached images are displayed in the forum post.

Participants can subscribe to a forum to receive notifications of new forum posts. A teacher can set the subscription mode to optional, forced or auto, or prevent subscription completely. If required, students can be blocked from posting more than a given number of posts in a given time period; this can prevent individuals from dominating discussions.

Forum posts can be rated by teachers or students (peer evaluation). Ratings can be aggregated to form a final grade which is recorded in the gradebook.

Forums have many uses, such as (moodle, 2021n):

- A social space for students to get to know each other
- For course announcements (using a news forum with forced subscription)
- For discussing course content or reading materials
- For continuing online an issue raised previously in a face-to-face session
- For teacher-only discussions (using a hidden forum)
- A help center where tutors and students can give advice
- A one-on-one support area for private student-teacher communications (using a forum with separate groups and with one student per group)
- For extension activities, for example 'brain teasers' for students to ponder and suggest solutions to

5.3.1.7. Glossary

The glossary activity module enables participants to create and maintain a list of definitions, like a dictionary, or to collect and organize resources or information.

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A teacher can allow files to be attached to glossary entries. Attached images are displayed in the entry. Entries can be searched or browsed alphabetically or by category, date or author. Entries can be approved by default or require approval by a teacher before they are viewable by everyone.

If the glossary auto-linking filter is enabled, entries will be automatically linked where the concept words and/or phrases appear within the course.

A teacher can allow comments on entries. Entries can also be rated by teachers or students (peer evaluation). Ratings can be aggregated to form a final grade which is recorded in the gradebook.

Glossaries have many uses, such as (moodle, 2021o):

- A collaborative bank of key terms
- A 'getting to know you' space where new students add their name and personal details
- A 'handy tips' resource of best practice in a practical subject
- A sharing area of useful videos, images or sound files
- A revision resource of facts to remember

5.3.1.8. H5P activity

H5P is an abbreviation for HTML5 Package - interactive content such as presentations, videos and other multimedia, questions, quizzes, games and more. The H5P activity enables H5P to be uploaded and added to a course.

Any question attempts are marked automatically, and the grade is recorded in the gradebook (moodle, 2021p).

5.3.1.9. Lesson

The lesson activity module enables a teacher to deliver content and/or practice activities in interesting and flexible ways. A teacher can use the lesson to create a linear set of content pages or instructional activities that offer a variety of paths or options for the learner. In either case, teachers can choose to increase engagement and ensure understanding by including a variety of questions, such as multiple choice, matching and short answer. Depending on the student's choice of answer and how the teacher develops the lesson, students may progress to the next page, be taken back to a previous page or redirected down a different path entirely.

A lesson may be graded, with the grade recorded in the gradebook.

Lessons may be used (moodle, 2021v):

- For self-directed learning of a new topic
- For scenarios or simulations/decision-making exercises
- For differentiated revision, with different sets of revision questions depending upon answers given to initial questions

5.3.1.10. (LTI) External tool

The external tool activity module enables students to interact with learning resources and activities on other web sites. For example, an external tool could provide access to a new activity type or learning materials from a publisher.

To create an external tool activity, a tool provider which supports LTI (Learning Tools Interoperability) is required. A teacher can create an external tool activity or make use of a tool configured by the site administrator.

External tool activities differ from URL resources in a few ways (moodle, 2021i):

- External tools are context aware e.g.: they have access to information about the user who launched the tool, such as institution, course and name
- External tools support reading, updating, and deleting grades associated with the activity instance

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- External tool configurations create a trust relationship between your site and the tool provider, allowing secure communication between them

5.3.1.11. Quiz

The quiz activity enables a teacher to create quizzes comprising questions of various types, including multiple choice, matching, short-answer and numerical.

The teacher can allow the quiz to be attempted multiple times, with the questions shuffled or randomly selected from the question bank. A time limit may be set.

Each attempt is marked automatically, with the exception of essay questions, and the grade is recorded in the gradebook.

The teacher can choose when and if hints, feedback and correct answers are shown to students.

Quizzes may be used (moodle, 2021x):

- As course exams
- As mini tests for reading assignments or at the end of a topic
- As exam practice using questions from past exams
- To deliver immediate feedback about performance
- For self-assessment

5.3.1.12. SCORM

A SCORM package is a collection of files which are packaged according to an agreed standard for learning objects. The SCORM activity module enables SCORM or AICC packages to be uploaded as a zip file and added to a course.

Content is usually displayed over several pages, with navigation between the pages. There are various options for displaying content in a pop-up window, with a table of contents, with navigation buttons etc. SCORM activities generally include questions, with grades being recorded in the gradebook.

SCORM activities may be used (moodle, 2021aa):

- For presenting multimedia content and animations
- As an assessment tool

5.3.1.13. Survey

The survey activity module provides a number of verified survey instruments that have been found useful in assessing and stimulating learning in online environments. A teacher can use these to gather data from their students that will help them learn about their class and reflect on their own teaching.

Note that these survey tools are pre-populated with questions. Teachers who wish to create their own survey should use the feedback activity module (moodle, 2021ad).

5.3.1.14. Wiki

The wiki activity module enables participants to add and edit a collection of web pages. A wiki can be collaborative, with everyone being able to edit it, or individual, where everyone has their own wiki which only they can edit.

A history of previous versions of each page in the wiki is kept, listing the edits made by each participant.

Wikis have many uses, such as (moodle, 2021af):

- For group lecture notes or study guides
- For members of a faculty to plan a scheme of work or meeting agenda together
- For students to collaboratively author an online book, creating content on a topic set by their tutor

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- For collaborative storytelling or poetry creation, where each participant writes a line or verse
- As a personal journal for examination notes or revision (using an individual wiki)

5.3.1.15. Workshop

The workshop activity module enables the collection, review and peer assessment of students' work.

Students can submit any digital content (files), such as word-processed documents or spreadsheets and can also type text directly into a field using the text editor.

Submissions are assessed using a multi-criteria assessment form defined by the teacher. The process of peer assessment and understanding the assessment form can be practiced in advance with example submissions provided by the teacher, together with a reference assessment. Students are given the opportunity to assess one or more of their peers' submissions. Submissions and reviewers may be anonymous if required.

Students obtain two grades in a workshop activity - a grade for their submission and a grade for their assessment of their peers' submissions. Both grades are recorded in the gradebook (moodle, 2021ah).

5.3.2. Resources

A resource is an item that a teacher can use to support learning, such as a file or link. Moodle supports a range of resource types which teachers can add to their courses. In edit mode, a teacher can add resources via the 'Add an activity or resource' link. Resources appear as a single link with an icon in front of it that represents the type of resource.

Administrators can decide whether or not to force teachers to add descriptions for each resource by enabling or disabling a site-wide setting in Administration > Plugins > Activity modules > Common settings (moodle, 2021z).

5.3.2.1. Book

The book module enables a teacher to create a multi-page resource in a book-like format, with chapters and subchapters. Books can contain media files as well as text and are useful for displaying lengthy passages of information which can be broken down into sections.

A book may be used (moodle, 2021e):

- To display reading material for individual modules of study
- As a staff departmental handbook
- As a showcase portfolio of student work

5.3.2.2. File

The file module enables a teacher to provide a file as a course resource. Where possible, the file will be displayed within the course interface; otherwise students will be prompted to download it. The file may include supporting files, for example an HTML page may have embedded images.

Note that students need to have the appropriate software on their computers in order to open the file.

A file may be used (moodle, 2021k):

- To share presentations given in class
- To include a mini website as a course resource
- To provide draft files of software programs so students can edit and submit them for assessment

5.3.2.3. Folder

The folder module enables a teacher to display a number of related files inside a single folder, reducing scrolling on the course page. A zipped folder may be uploaded and unzipped for display, or an empty folder created and files uploaded into it.

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A folder may be used (moodle, 2021m):

- For a series of files on one topic, for example a set of past examination papers in pdf format or a collection of image files for use in student projects
- To provide a shared uploading space for teachers on the course page (keeping the folder hidden so that only teachers can see it)

5.3.2.4. IMS content package

An IMS content package is a collection of files which are packaged according to an agreed standard so they can be reused in different systems. The IMS content package module enables such content packages to be uploaded as a zip file and added to a course as a resource.

Content is usually displayed over several pages, with navigation between the pages. There are various options for displaying content in a pop-up window, with a navigation menu or buttons etc.

An IMS content package may be used for presenting multimedia content and animations (moodle, 2021q).

5.3.2.5. Label

The label module enables text and multimedia to be inserted into the course page in between links to other resources and activities. Labels are very versatile and can help to improve the appearance of a course if used thoughtfully.

Labels may be used (moodle, 2021u):

- To split up a long list of activities with a subheading or an image
- To display an embedded sound file or video directly on the course page
- To add a short description to a course section

5.3.2.6. Page

The page module enables a teacher to create a web page resource using the text editor. A page can display text, images, sound, video, web links and embedded code, such as Google maps.

Advantages of using the page module rather than the file module include the resource being more accessible (for example to users of mobile devices) and easier to update.

For large amounts of content, it's recommended that a book is used rather than a page.

A page may be used (moodle, 2021z):

- To present the terms and conditions of a course or a summary of the course syllabus
- To embed several videos or sound files together with some explanatory text

5.3.2.7. URL

The URL module enables a teacher to provide a web link as a course resource. Anything that is freely available online, such as documents or images, can be linked to; the URL does not have to be the home page of a website. The URL of a particular web page may be copied and pasted or a teacher can use the file picker and choose a link from a repository such as Flickr, YouTube or Wikimedia (depending upon which repositories are enabled for the site).

There are a number of display options for the URL, such as embedded or opening in a new window and advanced options for passing information, such as a student's name, to the URL if required.

Note that URLs can also be added to any other resource or activity type through the text editor (moodle, 2021ae).

5.4. Additional interventions on Moodle platform

Some additional interventions made for the proper operation of the Moodle platform include changing the maximum size of the uploading file, creation of custom menu item for accessing the lesson and

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adding a platform’s logo (see [Appendix 1](#)) and the settings that affect the platform language packages.

Moreover, the InSIDE UOA project team removed the user ability to switch languages so that the only and default language of this Moodle version to be English.

That was achieved by appropriately changing the following settings (path): Dashboard / Site administration / Language / Language settings

- Language autodetect → Off (Default: Yes)
- Default language → English (en) (Default: English (en))
- Display language menu → Off (Default: Yes)

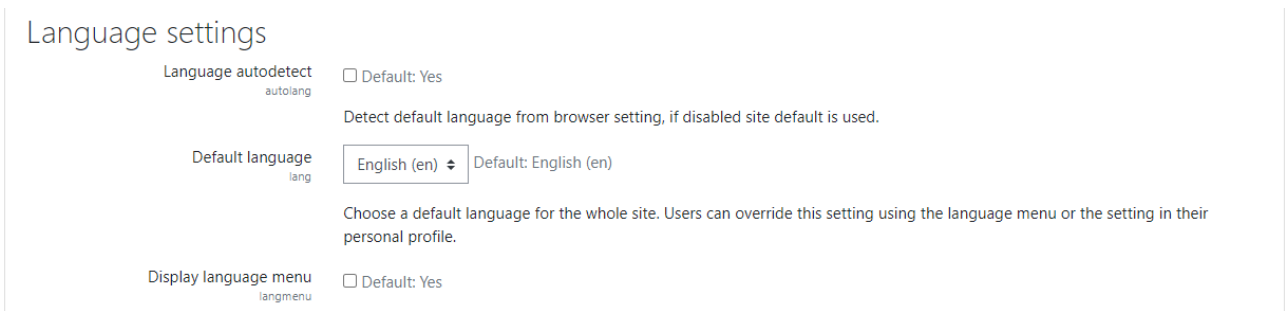


Figure 53. Modifications on Moodle platform "Language settings"

Furthermore, all the other language packs except English were removed.

This result was achieved by performing the following procedure (path): “Language import utility” Dashboard / Site administration / Language / Language packs

- Installed language packs → English (en)

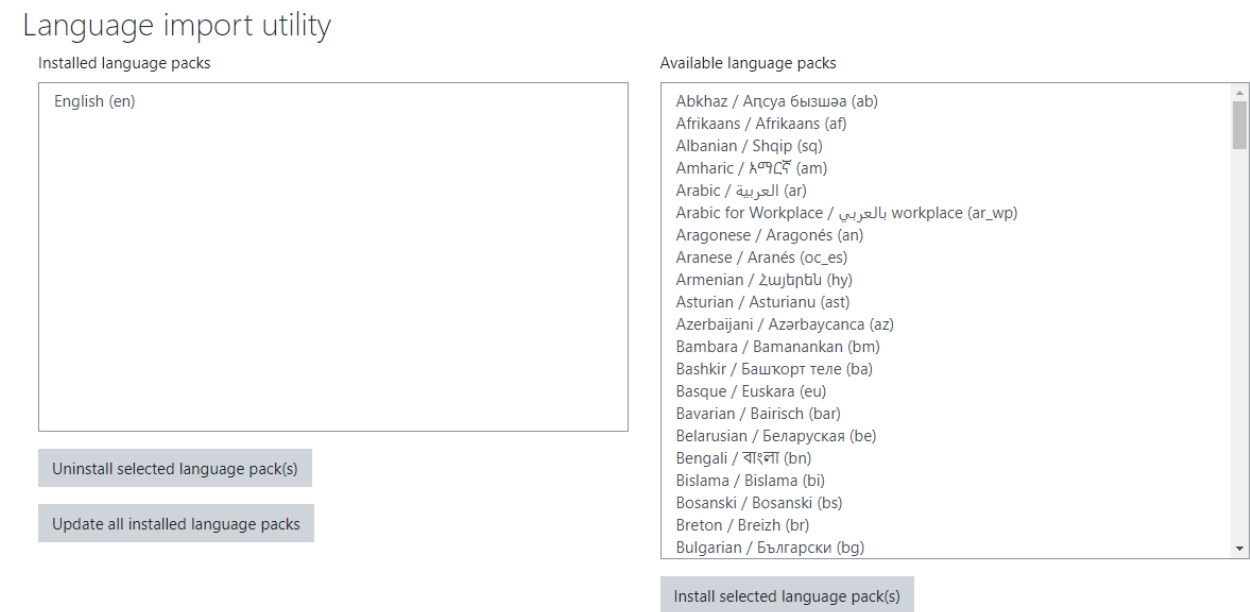


Figure 54. Modifications on Moodle platform "Language packs"

Finally, the InSIDE UOA project team converted the font-family of the platform's main part into “Arial”, which is one of the most accessible font-families.

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Raw SCSS
theme_boost | scss

```
body { font-family: 'Arial' ; }
```

Default: Empty

Use this field to provide SCSS or CSS code which will be injected at the end of the style sheet.

Figure 55. Conversion of font-family into "Arial"

To make it easier for users to find guidelines for creating accessible files from anywhere on the Moodle platform, the InSIDE UOA project team embedded the following custom menu. If you want to see how the modification was made, see [Appendix 1](#).

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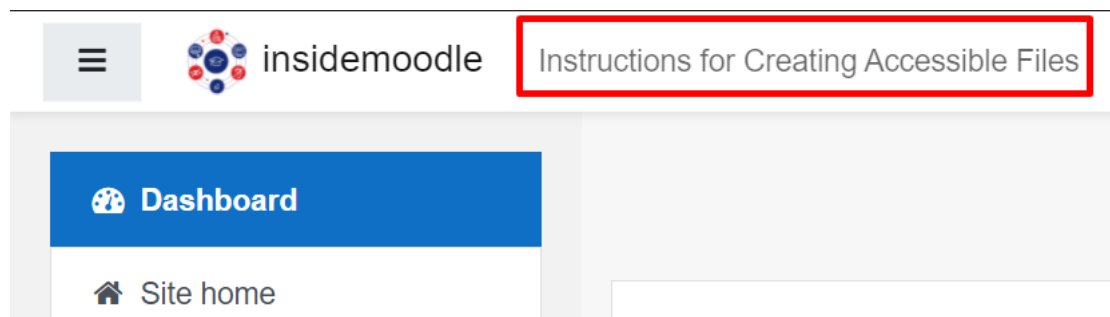


Figure 56. The custom menu item

According to the website's logo, we have made the following modification on Moodle platform, so as to be so as the identity of the InSIDE website to be visible for the users.

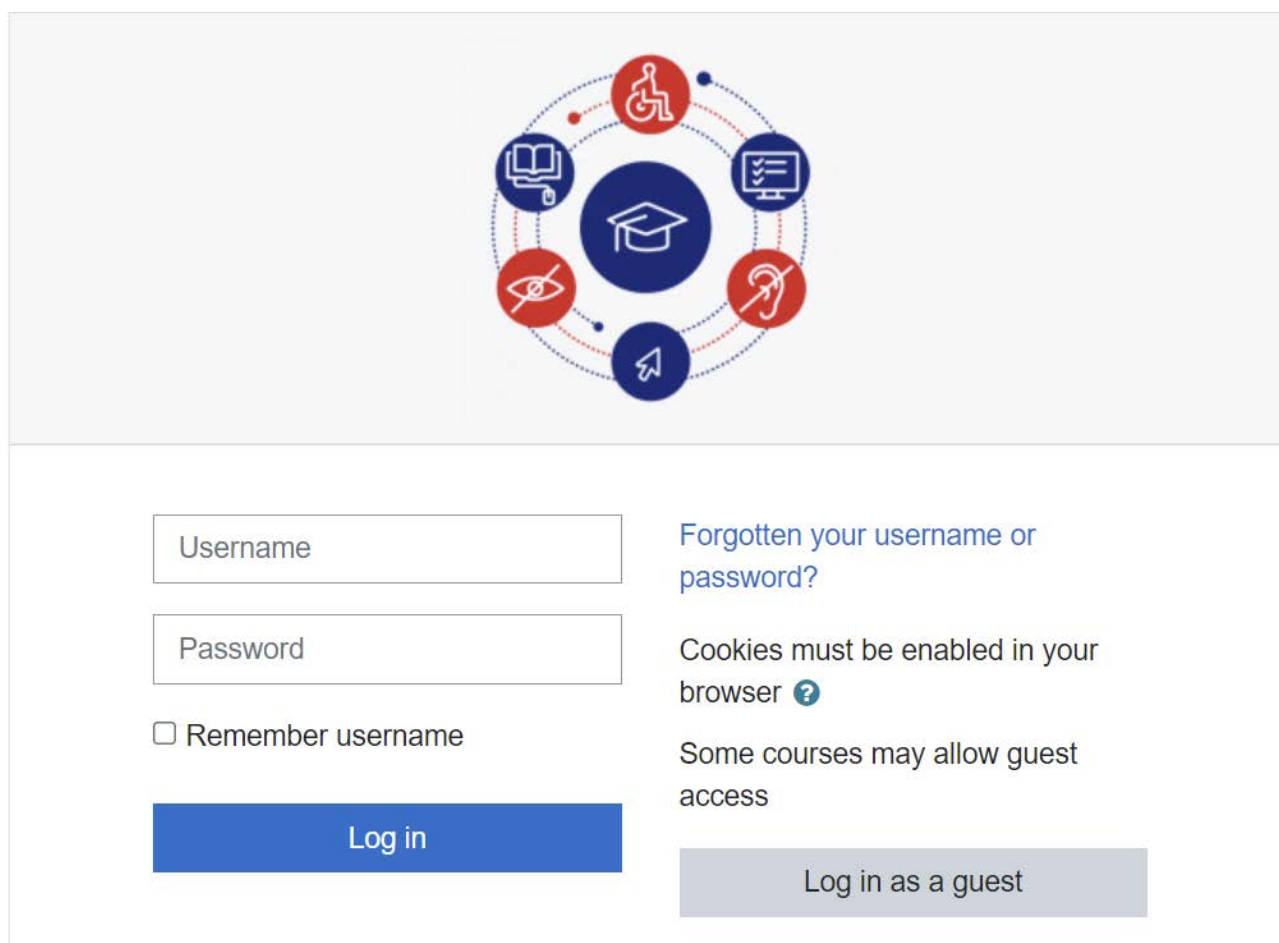


Figure 57. InSIDE Moodle platform's logo - Login page

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Site administration

[Site administration](#) [Users](#) [Courses](#) [Grades](#) [Plugins](#) **[Appearance](#)** [Server](#) [Reports](#) [Development](#)

Appearance

Logos

- [Course card colours](#)
- [Calendar](#)
- [Blog](#)
- [Navigation](#)
- [HTML settings](#)
- [Moodle Docs](#)
- [Default Dashboard page](#)
- [Default profile page](#)
- [Courses](#)
- [AJAX and Javascript](#)
- [Manage tags](#)
- [Additional HTML](#)
- [Templates](#)
- [User tours](#)

Figure 58. Modification on Moodle platform's logo appearance

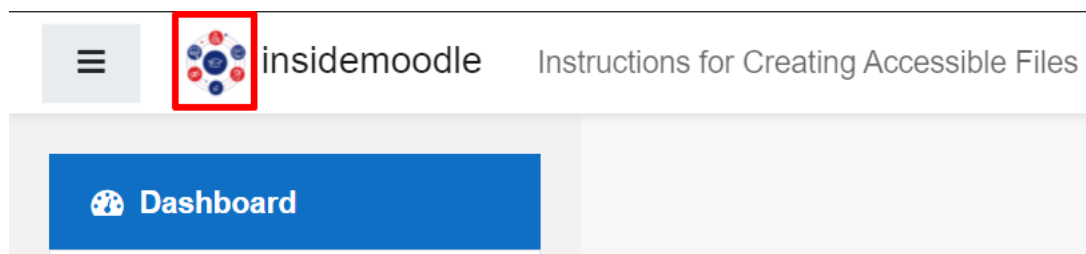


Figure 59. InSIDE Moodle platform's logo

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insidemoodle

Instructions for Creating Accessible Files

Dashboard

Site home

Calendar

Private files

Content bank

Site administration

Available courses

Instructions for Creating Accessible Files

Figure 60. Instructions for Creating Accessible Files InSIDE logo

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Appendix 1: Adding a new user to Moodle platform and enrolling him/her in the course

The administrator of Moodle platform has the opportunity to add new users to it following the path: Site administration → Users → Accounts → Add a new user. To do that, the administrator should have the following information, as you can see in the image below:

- the user's first name
- the user's surname
- an email address
- a username
- a password, that must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s), at least 1 upper case letter(s), at least 1 non-alphanumeric character(s) such as *, -, , or #

The screenshot shows the 'Add a new user' form in Moodle. The form is titled 'General' and includes the following fields and options:

- Username:** A text input field.
- Choose an authentication method:** A dropdown menu with 'Manual accounts' selected. Below it are checkboxes for 'Suspended account' and 'Generate password and notify user'.
- New password:** A text input field with a 'Click to enter text' button. Below it is a checkbox for 'Force password change'.
- First name:** A text input field.
- Surname:** A text input field.
- Email address:** A text input field.
- Email display:** A dropdown menu with 'Allow only other course members to see my email address' selected.
- MoodleNet profile:** A text input field.
- City/town:** A text input field with 'ATHENS' entered.
- Select a country:** A dropdown menu with 'Greece' selected.
- Timezone:** A dropdown menu with 'Server timezone (Europe/Athens)' selected.
- Preferred language:** A dropdown menu with 'English (en)' selected.
- Description:** A rich text editor with a toolbar and a large text area.

Figure 61. Adding a new user to Moodle platform

Having done this step, the administrator should enroll the users, who are going to have the role of the teachers in the specific course. So, he/she selects the course, and through "Participants", clicks on "Enroll users". He/She selects the user to be enrolled and his/her role, and then, he/she clicks again on "Enroll users".

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Enrolment options

Select users

✕  **New User** newuser@gmail.com

Search

Assign role

Teacher

[Show more...](#)

Enrol users

Cancel

Figure 62. Enrolling a teacher in the course

The image below, depicts the participants of a course:

Participants



Enrol users

Match

+ Add condition

6 participants found

First name

Surname

<input type="checkbox"/>	First name / Surname	Email address	Roles	Groups	Last access to course	Status
<input type="checkbox"/>			No roles	No groups	Never	Active
<input type="checkbox"/>			Teacher	No groups	20 mins 43 secs	Active
<input type="checkbox"/>			No roles	No groups	289 days 3 hours	Active
<input type="checkbox"/>			No roles	No groups	Never	Active
<input type="checkbox"/>			No roles	No groups	1 year 334 days	Active
<input type="checkbox"/>			Student	No groups	Never	Active

With selected users...

Enrol users

Figure 63. The participants of a course

Now, the user assigned the role “Teacher” has the ability to enroll students in the course (already added users to Moodle platform by the administrator) by assigning them the role “Student”.

Enrol users

Enrolment options

Select users

✕

New User

newuser@gmail.com

Search

▼

Assign role

Student

⬆

[Show more...](#)

Enrol users

Cancel

Figure 64. Enrolling a student in the course

Appendix 2: Instructions to Moodle Administrators

Steps to insert the Accessibility warning

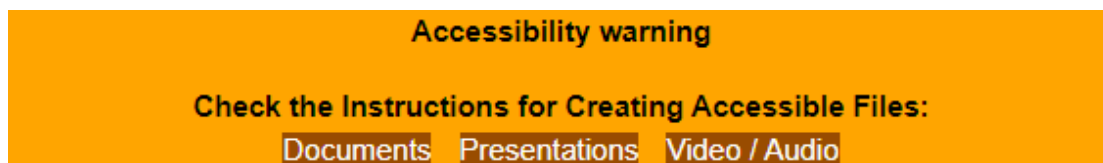


Figure 65. Example of the accessibility warning message.

First of all, anyone wishing to make changes to the Moodle platform should have rights to access and modify the platform installation files on the server. The file that should be modified so as the Accessibility message to be constructed is “filemanager_page_generallayout.mustache” and it can be found following the path below:

Path: /var/www/html/moodle/lib/templates/filemanager_page_generallayout.mustache

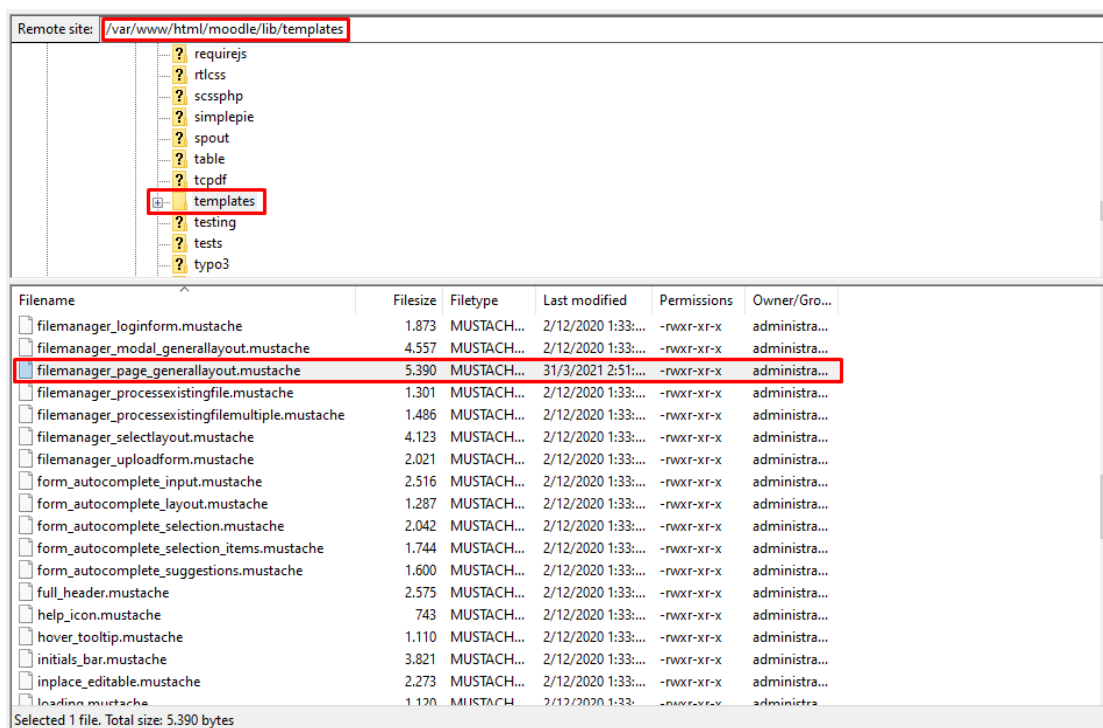


Figure 66. The path where is the “filemanager_page_generallayout.mustache” file to be modified

The code that should be inserted in the abovementioned file, so as the Accessibility message to be presented is the following (moodle, 2021ag):

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```

<div id="filemanager-{{{client_id}}}" class="filemanager w-100 fm-loading">
  <div style="background-color:orange; width:50%; font-family:Arial; text-align:center;">
    <span style="color:black;">
      <p><strong> Accessibility warning </strong> </p>
      <strong> Check the Instructions for Creating Accessible Files: <br> </strong>
      <a href="http://insidemoodle.di.uoa.gr/mod/page/view.php?id=70" target="_blank" style="color:white; background-color:#994C00; margin-right: 10px;">Documents</a>
      <a href="http://insidemoodle.di.uoa.gr/mod/page/view.php?id=71" target="_blank" style="color:white; background-color:#994C00; margin-right: 10px;">Presentations</a>
      <a href="http://insidemoodle.di.uoa.gr/mod/page/view.php?id=68" target="_blank" style="color:white; background-color:#994C00;">Video / Audio</a>
    </span>
  </div>

  <div class="fp-restrictions">
    {{{restrictions}}}
    <span class="dnduploadnotsupported-message"> - {{{str}}dndnotsupported_insentence{{{str}}}{{{helpicon}}}</span>
  </div>

  <div class="fp-navbar bg-faded card mb-0">
    <div class="filemanager-toolbar icon-no-spacing">
      <div class="fp-toolbar">
        <div class="fp-btn-add">
          <a role="button" title="{{str}}addfile, repository{{{str}}}" class="btn btn-secondary btn-sm" href="#">

```

Figure 67. Example of the code for creating the accessibility warning

The initial file size that a user can upload on the platform is 2MB. To make it easier for users to organize lessons with large files, the maximum file size for files to be uploaded should have been modified into 20MB. For anyone wishing to make the modification mentioned before, he/she must have rights to enter and modify the “php.ini” file. This file can be found following the path bellow:

Path: /etc/php/7.2/apache2/php.ini

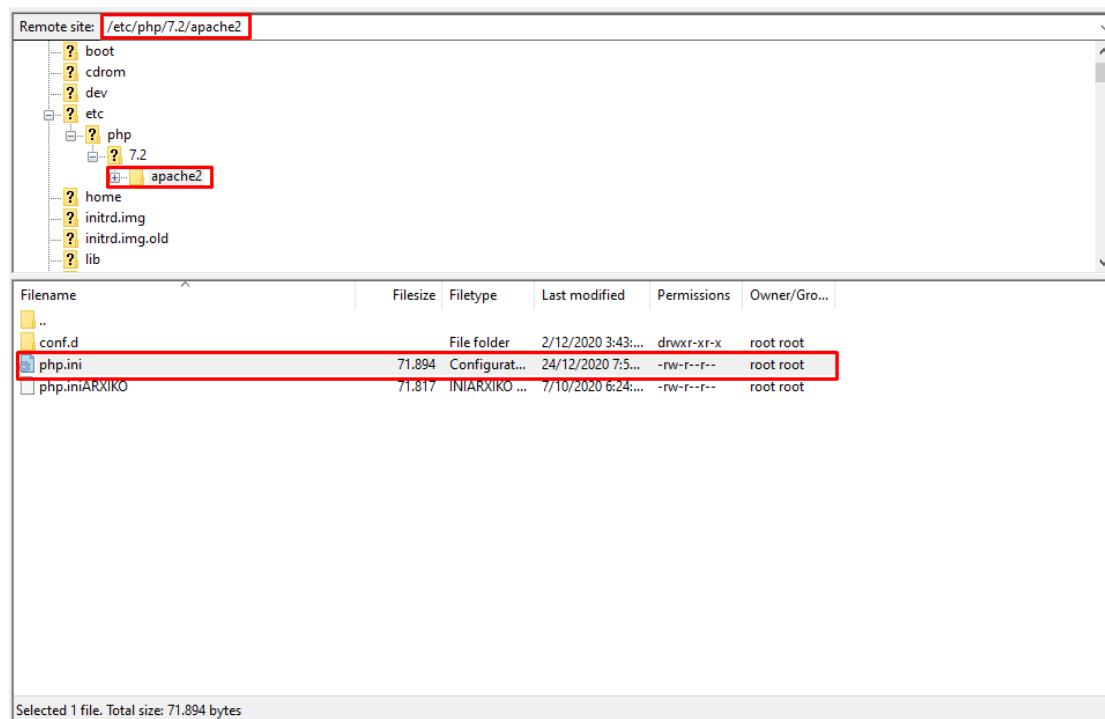


Figure 68. The path where is the "php.ini" file to be modified

The code that should be inserted in the abovementioned file, so as the maximum file size to be modified is the following (moodle, 2021l):

- `post_max_size = 8M` → `post_max_size = 20M`

```

; Maximum size of POST data that PHP will accept.
; Its value may be 0 to disable the limit. It is ignored if POST data reading
; is disabled through enable_post_data_reading.
; http://php.net/post-max-size
; post_max_size = 8M
post_max_size = 20M

```

Figure 69. The example of the code for changing the “post_max_size”

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- upload_max_filesize = 2M → upload_max_filesize = 20M

```
; Maximum allowed size for uploaded files.  
; http://php.net/upload-max-filesize  
; upload_max_filesize = 2M  
upload_max_filesize = 20M
```

Figure 70. The example of the code for changing the “upload_max_filesize”

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- `max_execution_time = 30` → `max_execution_time = 600`

```
; Maximum execution time of each script, in seconds
; http://php.net/max-execution-time
; Note: This directive is hardcoded to 0 for the CLI SAPI
; max_execution_time = 30
max_execution_time = 600
```

Figure 71. The example of the code for changing the “max_execution_time”

The following modification should be made to make it easier for users to find guidelines for creating accessible files from anywhere on the Moodle platform:

insidemoodle.di.uoa.gr

[Dashboard](#) / [Site administration](#) / [Search](#)

Site administration

Search

[Site administration](#) [Users](#) [Courses](#) [Grades](#) [Plugins](#) [Appearance](#) [Server](#) [Reports](#) [Development](#)

Appearance

[Logos](#)
[Course card colours](#)
[Calendar](#)
[Blog](#)
[Navigation](#)
[HTML settings](#)
[Moodle Docs](#)
[Default Dashboard page](#)
[Default profile page](#)
[Courses](#)
[AJAX and Javascript](#)
[Manage tags](#)
[Additional HTML](#)
[Templates](#)
[User tours](#)

Themes

[Theme settings](#)
[Theme selector](#)
[Boost](#)
[Classic](#)

Figure 72. Access to the main webpage from the custom menu item

The code that should be inserted here is the following “Instructions for Creating Accessible Files|/course/view.php?id=5” (Hubken group, 2021).

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Custom menu items
custommenuitems

Instructions for Creating Accessible Files/course/view.php?id=5

Default: Empty

A custom menu may be configured here. Enter each menu item on a new line with format: menu text, a link URL (optional, not for a top menu item with sub-items), a tooltip title (optional) and a language code or comma-separated list of codes (optional, for displaying the line to users of the specified language only), separated by pipe characters. Lines starting with a hyphen will appear as menu items in the previous top level menu and ### makes a divider. For example:

```

Courses
-All courses|/course/
-Course search|/course/search.php
-###
-FAQ|https://someurl.xyz/faq
-Preguntas más frecuentes|https://someurl.xyz/pmf||es
Mobile app|https://someurl.xyz/app|Download our app

```

Figure 73. The code so as to be feasible access to the main webpage from the custom menu item

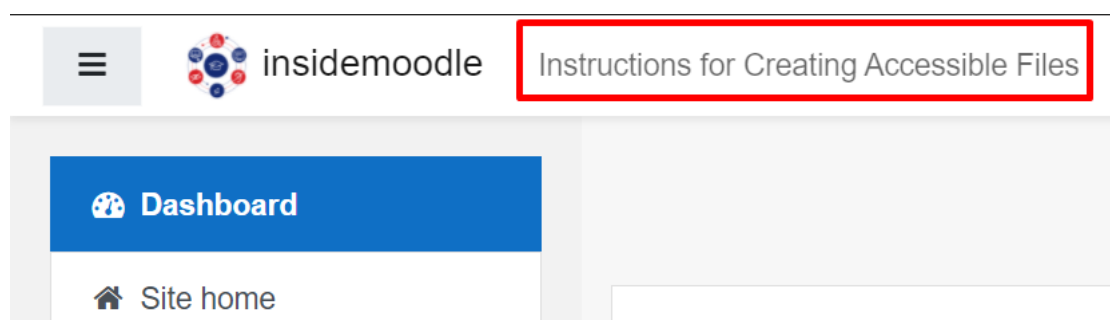


Figure 74. The custom menu item

For anyone wishing to make the modification mentioned before, he/she must have an admin role on Moodle platform.

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Appendix 3: Export and import a course from/to Moodle

A useful feature that facilitates Moodle platform's users is the export of information contained in selected (by the user who tries to export a course) courses already built on the Moodle platform. This function can also be used in the case of the "Instructions for creating accessible files" (see [Appendix 3-10](#)) in order to transfer them to a different installation of the platform. The InSIDE UOA project team has attempted to extract a course from the platform and the specific process is described below: right click on course settings → Backup → Next → Next → Perform backup → Continue.

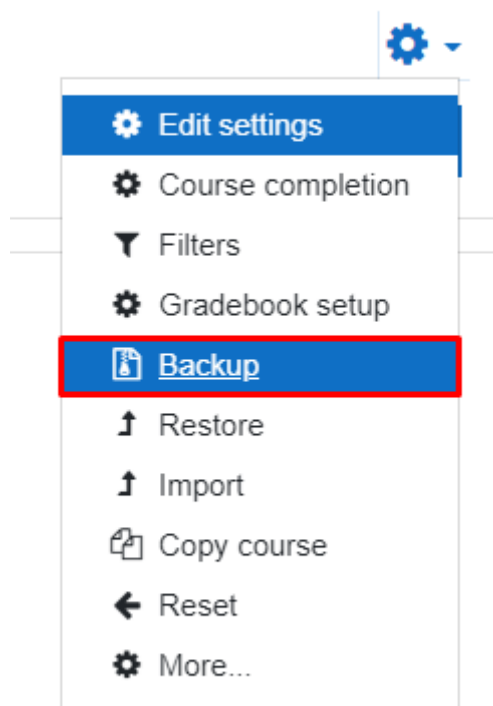


Figure 75. Backup: Step 1

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1. Initial settings ► 2. Schema settings ► 3. Confirmation and review ► 4. Perform backup ► 5. Complete

Backup settings

<input type="checkbox"/> IMS Common Cartridge 1.1
<input checked="" type="checkbox"/> Include enrolled users
<input type="checkbox"/> Anonymize user information
<input checked="" type="checkbox"/> Include user role assignments
<input checked="" type="checkbox"/> Include activities and resources
<input checked="" type="checkbox"/> Include blocks
<input checked="" type="checkbox"/> Include files
<input checked="" type="checkbox"/> Include filters
<input checked="" type="checkbox"/> Include comments
<input checked="" type="checkbox"/> Include badges
<input checked="" type="checkbox"/> Include calendar events
<input checked="" type="checkbox"/> Include user completion details
<input type="checkbox"/> Include course logs
<input type="checkbox"/> Include grade history
<input checked="" type="checkbox"/> Include question bank

Figure 76. Backup: Step 2a

<input checked="" type="checkbox"/> Include question bank
<input checked="" type="checkbox"/> Include groups and groupings
<input checked="" type="checkbox"/> Include competencies
<input checked="" type="checkbox"/> Include custom fields
<input checked="" type="checkbox"/> Include content bank content

[Jump to final step](#)
[Cancel](#)
[Next](#)

Figure 77. Backup: Step 2b

1. Initial settings ► 2. Schema settings ► 3. Confirmation and review ► 4. Perform backup ► 5. Complete

Include:

Select All / None (Show type options)	Select All / None
<input checked="" type="checkbox"/> General	<input checked="" type="checkbox"/> User data
<input checked="" type="checkbox"/> Documents	<input checked="" type="checkbox"/> User data
<input checked="" type="checkbox"/> Quick guidelines for creating accessible documents	<input checked="" type="checkbox"/> -
<input checked="" type="checkbox"/> Presentations	<input checked="" type="checkbox"/> User data
<input checked="" type="checkbox"/> Quick guidelines for creating accessible presentations	<input checked="" type="checkbox"/> -
<input checked="" type="checkbox"/> Video / Audio	<input checked="" type="checkbox"/> User data
<input checked="" type="checkbox"/> Quick guidelines for creating accessible video/audio files	<input checked="" type="checkbox"/> -

[Previous](#)
[Cancel](#)
[Next](#)

Figure 78. Backup: Step 3

InSIDE project	Page	WP3: Development
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1. Initial settings ► 2. Schema settings ► 3. Confirmation and review ► 4. Perform backup ► 5. Complete

Filename

Filename  backup-moodle2-course-5-instructions_for_creating_accessible_1

Backup settings

IMS Common Cartridge 1.1	
Include enrolled users	
Anonymize user information	
Include user role assignments	
Include activities and resources	
Include blocks	
Include files	
Include filters	
Include comments	
Include badges	
Include calendar events	
Include user completion details	
Include course logs	
Include grade history	

Figure 79. Backup: Step 4a

Include question bank	✓
Include groups and groupings	✓
Include competencies	✓
Include custom fields	✓
Include content bank content	✓

Included items:

General	✓	User data	✓
Documents	✓	User data	✓
Quick guidelines for creating accessible documents	✓	-	✓
Presentations	✓	User data	✓
Quick guidelines for creating accessible presentations	✓	-	✓

Figure 80. Backup: Step 4b

Video / Audio	✓	User data	✓
Quick guidelines for creating accessible video/audio files	✓	-	✓

Previous Cancel Perform backup

There are required fields in this form marked ❗

Figure 81. Backup: Step 4c

1. Initial settings ► 2. Schema settings ► 3. Confirmation and review ► 4. Perform backup ► 5. Complete

The backup file was successfully created.

Continue

Figure 82. Backup: Step 5

A user who wishes to import a course on Moodle platform, he/she should follow the steps below: right click on course settings → Restore → drag and drop the backup file he/she wishes into the drag and drop field → Restore.

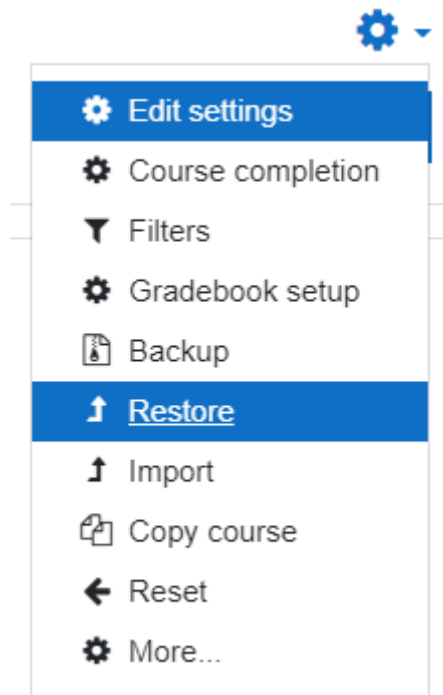


Figure 83. Restore: Step 1

Restore course

[Dashboard](#) / [Courses](#) / [Instructions for Creating Accessible Files](#) / [Restore](#)

Import a backup file

Files

Choose a file...

You can drag and drop files here to add them.

Restore

There are required fields in this form marked ❗.

Course backup area

Filename	Time	Size	Download	Restore
backup-moodle2-course-5-instructions_for_creating_accessible_files-20210426-1355.mbz	Monday, 26 April 2021, 1:59 PM	3.2MB	Download	Restore
backup-moodle2-course-5-instructions_for_creating_accessible_files-20210426-1335.mbz	Monday, 26 April 2021, 1:36 PM	3.2MB	Download	Restore

[Manage backup files](#)

User private backup area

Filename	Time	Size	Download	Restore
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[Manage backup files](#)

Figure 84. Restore: Step 2

Appendix 4: Quick guidelines for creating accessible math documents with MS-Office 2010



InSIDE

Including Students with Impairments in Distance Education

Quick guidelines for creating accessible math documents with MS-Office 2010

Mathematics in accessible format using MS-Word 2010

To insert Mathematics in an accessible format you must use the Equation Editor.

Write/edit an equation

Write an equation

To write an equation follow the steps below:

1. On **Insert** tab, in **Symbols** group, click the arrow next to **Equation**.
2. Click the equation you want or click **Insert New Equation** and enter the equation you want in the equation box that opens.
3. Clicking on the equation box opens the **Equation Tools** tab. In this tab you can find symbols and structures that you can insert into your equation in the **Symbols** and **Structures** groups, respectively.
4. When you have finished writing your equation, click outside the equation box.

Integration or not of the equation

To embed an equation in the text or to place it on a separate line follow the steps below:

1. If you want to have your equation embedded in the sentence and in the text environment, click on the specific text where you want to enter the equation and follow steps 1 to 4.
2. If you want to have your equation in a separate line centered between the margins of the page, follow steps 1 to 4, and then click the arrow to the right of the equation box to open the equation options. Select **Change to Display**.
3. If you want to embed an equation that is in a separate line in the text, click the arrow to the right of the equation box to open the equation options. Select **Change to Inline**. You can select and drag the equation to a selected position within the text, so it will automatically be converted into built-in format.

Edit an equation

To edit an equation, follow the steps below:

1. Click the equation you want to edit.

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2. Make the changes you want.
3. When you finished with the changes, click outside the equation box.

Add an equation to the list of frequently used equations

To add an equation to your list of frequently used equations, follow these steps:

1. Select the equation you want to add to the list of frequently used equations by clicking on the dots on the left, something that will darken the content of the box.
2. On the **Equation Tools**, on the **Design** tab, in the **Tools** group, click **Equation**. Then click **Save Selection to Equation Gallery**.
3. In the **Create New Building Block** dialog box, type a name for the equation in the **Name** field.
4. In the **Gallery** field, click **Equations**.
5. Activate any other options you want. And click **OK**.
6. The equation will be displayed along with the built-in equations.

Mathematical symbols-Mathematical structures-Word Structures

Mathematical symbols

Not all Equation Editor symbols are converted into LaTeX. Here are the symbols that can be transformed using the Equation Editor.

Standard

$a, b, c, d, e, f, g, h, i, j, k, l, m,$
 $n, o, p, q, r, s, t, u, v, w, x, y, z$
 $A, B, C, D, E, F, G, H, I, J, K, L, M,$
 $N, O, P, Q, R, S, T, U, V, W, X, Y, Z$

Greek

$\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \theta, \vartheta, \iota, \kappa, \lambda, \mu, \nu, \xi,$
 $\omicron, \pi, \varpi, \rho, \varrho, \sigma, \varsigma, \tau, \upsilon, \varphi, \phi, \chi, \psi, \omega$

The capital Greek letters should be converted into italics in order to be well transformed.

$A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M,$
 $N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega$

Symbols in letters form

$\forall, \mathbb{C}, \partial, \delta, \mathbb{F}, \mathbb{A}, \mathcal{H}, \mathfrak{S}, h, \hbar, \iota, \mathfrak{I}, j, \kappa, \mathcal{L}, \ell, \mathbb{N}, \wp,$
 $\mathbb{Q}, \mathcal{R}, \mathfrak{R}, \mathbb{Z}, \mathbb{U}, \mathcal{B}, \mathcal{E}, \exists, \mathbb{A}, \mathcal{F}, \mathcal{M}, \mathfrak{X}, \mathbb{J}, \mathbb{I}, \gamma$

Operators

$\pm, \div, \times, \mp, \propto, a/b, *, \circ, \cap, \cup, \oplus, \Pi, \sqcup, \wedge, \vee$
 $=, \neq, <, >, \leq, \geq, \ll, \lll, \gg, \ggg, \equiv, \sim, \simeq, \cong, \ncong, \propto, \ll, \gg,$
 $\in, \ni, \notin, \subset, \supset, \subseteq, \supseteq, \prec, \succ, \preceq, \succeq, \sqsubset, \sqsupset, \sqsubseteq, \sqsupseteq, \parallel, \perp, \vdash, \dashv, \asymp$

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Geometry

⊥, ∠, ∠, ∠, ⊥, †, ‡, ∴, ∴, ∴

Mathematical structures

It is not possible all the structures provided by the Word equation editor to be transformed. The equations can be placed either in an “inline” form in the text or as “displayed”.

Inline math

$$A_{i,j,k}^{2^n}$$

Displayed math

$$\sum_{i=1}^{13} x_i^2 = x_1^2 + x_2^2 + x_3^2 + x_4^2 + x_5^2 + x_6^2 + x_7^2 + x_8^2 + x_9^2 + x_{10}^2 + x_{11}^2 + x_{12}^2 + x_{13}^2$$

$$x_1^2 = x_2^2 = x_3^2 = x_3^2 = x_4^2 = x_5^2 = x_6^2 = x_7^2 = x_8^2 = x_9^2 = x_{10}^2 = x_{11}^2 = x_{12}^2 = x_{13}^2$$

$$\prod_{i=1}^{13} x_i^2 = x_1^2 x_2^2 x_3^2 x_4^2 x_5^2 x_6^2 x_7^2 x_8^2 x_9^2 x_{10}^2 x_{11}^2 x_{12}^2 x_{13}^2$$

$$\prod_{i=1}^{13} x_i^2 = x_1^2 \cdot x_2^2 \cdot x_3^2 \cdot x_4^2 \cdot x_5^2 \cdot x_6^2 \cdot x_7^2 \cdot x_8^2 \cdot x_9^2 \cdot x_{10}^2 \cdot x_{11}^2 \cdot x_{12}^2 \cdot x_{13}^2$$

$$\sqrt{\sum_{i=1}^{13} x_i^2} = \sqrt{x_1^2 + x_2^2 + x_3^2 + x_4^2 + x_5^2 + x_6^2 + x_7^2 + x_8^2 + x_9^2 + x_{10}^2 + x_{11}^2 + x_{12}^2 + x_{13}^2}$$

You can align the equations following the steps below:

- 1) you create them as separately depicted objects ,
- 2) you select them,
- 3) right click,
- 4) click on “Align at =”.

$$\begin{aligned} a &= b + c \\ &= d \end{aligned}$$

However, this format will not be retained in other formats. Line changes will be lost and significant presentation problems may occur when translating into LaTeX. Keep the equations separate and do not choose to align them in the center as a group.

$$\sum_{i=1}^{13} 2^i = 2^1 + 2^2 + 2^3 + 2^4 + 2^5 + 2^6 + 2^7 + 2^8 + 2^9 + 2^{10} + 2^{11} + 2^{12} + 2^{13}$$

$$= 2 + 4 + 8 + 16 + 32 + 64 + 128 + 256 + 1024 + 2048 + 4096 + 8192$$

= 16382 in the equation tools, there is a button for entering normal text, too.

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Word structures

$$\frac{a}{b}, a/b, \frac{a}{b}$$

$$x^2, x_2, x_1^2, {}_1^2x$$

$$\sqrt{a}, \sqrt[b]{a}, \sqrt[2]{a}, \sqrt[3]{a}$$

$$\int x, \int_a^b x, \int_a^b x, \iint x, \iint_a^b x, \iint_a^b x,$$

$$\oint x, \oint_a^b x, \oint_a^b x,$$

$$\sum x, \sum_a^b x, \sum_a^b x, \sum_a x, \sum_a x$$

$$\prod x, \prod_a^b x, \prod_a^b x, \prod_a x, \prod_a x, \coprod x, \coprod_a^b x, \coprod_a^b x, \coprod_a x, \coprod_a x$$

$$(x), [x], \{x\}, |x|, [x[,]x],]x[$$

$$(x, [x, \{x, |x, \dots, x|, x\}, x], x)$$

$$\begin{Bmatrix} a \\ b \end{Bmatrix}$$

$$\begin{Bmatrix} a \\ b \\ c \end{Bmatrix}$$

$$a$$

$$b$$

$$\binom{a}{b}$$

$$\sin x, \cos x, \tan x, \csc x, \sec x, \cot x$$

$$\sin^{-1} x, \cos^{-1} x, \tan^{-1} x, \csc^{-1} x, \sec^{-1} x, \cot^{-1} x$$

$$\sinh x, \cosh x, \tanh x, \operatorname{csch} x, \operatorname{sech} x, \operatorname{coth} x,$$

$$\sinh^{-1} x, \cosh^{-1} x, \tanh^{-1} x, \operatorname{csch}^{-1} x, \operatorname{sech}^{-1} x, \operatorname{coth}^{-1} x$$

$$\log_a b, \log b, \lim_a b, \min_a b, \max_a b, \ln b$$

$$:=, =, +, -, \triangle, \xleftarrow{x}, \xrightarrow{x}, \xleftrightarrow{x}, \xleftrightarrow{x}, \xleftrightarrow{x}, \xleftrightarrow{x}, \xleftrightarrow{x}, \xleftrightarrow{x}, \xleftrightarrow{x}$$

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

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$$\begin{pmatrix} 1 & \cdots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \cdots & 1 \end{pmatrix}$$

$$\begin{bmatrix} 1 & \cdots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \cdots & 1 \end{bmatrix}$$

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}, \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \left| \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \right|$$

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Mathematics in accessible format using MS-PowerPoint 2010

To enter mathematics in an accessible format you should use the Equation Editor.

Write/edit an equation

Write an equation

To write an equation follow the steps below:

1. On the **Insert** tab, in the **Symbols** group, click the arrow below **Equation**.
2. Click the equation you want or click **Insert New Equation** and type the equation you want in the colored area that appears on your slide.
3. On the **Equation Tools** tab you can find symbols and structures that you can insert into your equation in **Symbols** and **Structures** groups, respectively.
4. When you have finished writing your equation, click outside the colored area of the equation.
5. To change your equation alignment, select it so as the colored area to be displayed and right-click on it. In the **Display Math** option, select the alignment you want.

Edit an equation

1. Click the equation you want to edit.
2. Make the changes you want.
3. When you finished with the changes, click outside the colored area of the equation.

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InSIDE

Including Students with Impairments in Distance Education

www.inside-project.org

InSIDE “Including Students with Impairments in Distance Education” is a project co-financed under the Erasmus+ Programme, Key Activity KA2: Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education (Project No. 598763-EPP-1-2018-1-EL-EPPKA2-CBHE-JP) with three university partners from Europe and eleven university partners from Algeria, Morocco and Tunisia (Partner Countries).

Co-funded by the
Erasmus+ Programme
of the European Union



These guidelines have been produced by:



National and Kapodistrian University of Athens

Greece



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Appendix 5: Quick guidelines for creating accessible documents with MS-Word 2010



InSIDE

Including Students with Impairments in Distance Education

Quick guidelines for creating accessible documents with MS-Word 2010

Use styles for the structure of large documents

The structure of a document usually includes a title (and sometimes a subtitle), which are unique and can only be found on the first page. Also, a text is usually divided into multi-level chapters and sub-chapters where the appropriate heading corresponds.

This rule ensures that the authors have used built-in styles throughout the whole text body, title, subtitle, headings, and paragraphs for documents containing at least 1200 words. Thus, a perceptual structure is created even for users with blindness who use a synthetic speech screen reader program. Headings should be short, i.e., a few words or a short phrase, so that users can easily and quickly navigate the document. Also, the structure of the document should start with Heading1 (first level), and when the level of detail increases, the heading level should also increase, i.e., Headings2 (second level), Headings3, etc., follow Heading1, in order for the document to have a logical structure. It should have been decided in advance how many heading levels will be used, and if/how they will be numbered.

Why? By using styles you can create a coherent structure in your documents, and the use of headings makes the navigation of your document easier. The headings numbering makes it easier for the user to understand the level of the text where he/she is located.

How to use/add: To apply a style to the entire document, follow the next steps:

- 1.1. Select the whole text.
- 1.2. On the **Home** tab, in the **Styles** group, select the style you want for the body text (e.g., Normal or No spacing).
- 1.3. Select the title text.
- 1.4. On the **Home** tab, in the **Styles** group, click on **Title**.
- 1.5. Select the subtitle text.
- 1.6. On the **Home** tab, in the **Styles** group, click on **Subtitle**.

If you want to use the default heading numbering type, move to step 1.10

- 1.7. If you want to set the numbering type for the headings, in the **Home** tab, in the **Styles** group, right-click on **Heading1** and select **Modify Style**.
- 1.8. In the **Modify Style** window, click **Format** and then **Numbering and Bullets**. Select the numbering type that you want and click **OK**.
- 1.9. Repeat the above two steps for all the heading levels you are going to use.
- 1.10. Select the heading text.
- 1.11. On the **Home** tab, in the **Style** group, click the **Heading** that corresponds to the desired level.

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Use alternative text in all objects

This rule ensures that the authors have provided alternative text for the following objects: images, graphs, photographs, data tables, shapes.

Why? Through alternative text, users, even people with blindness, perceive the information presented in images and other objects in alternative ways (such as audio or tactile).

How to fix: To add alternative text to the object, follow these steps:

- 2.1. Right-click on the object and select **Format Picture**. For tables, right-click and select **Table Properties**.
- 2.2. Click **Alt Text**.
- 2.3. Add a description of the item in the **Description** field. Do not write alternative text in the **Title** field. If the object is an image, the description should start with the word "image" or equivalent (e.g., logo, shape).
- 2.4. When you have finished click on "**Close**".

Note: The above rule is applied in exactly the same way to the following object categories: ClipArt images, SmartArt graphics, embedded objects, video and audio files, groups (all objects, except shapes, must have alternative text also when belonging to groups).

Use tables with simple structure and a header line

This rule ensures that authors have used tables with a simple, two-dimensional structure that do not contain merged or split cells and have correctly defined a header line (or lines) for the tables. If the table extends to more than one page, it is necessary to add a header line in it.

Why? The table should have a simple two-dimensional structure and a header line, so that people with disabilities can easily navigate and understand it. Somebody who uses a screen reader program will have difficulty navigating the table in case he/she needs for example to combine the values from two cells to understand the content of the table.

How to add: To add a table with a two-dimensional structure and a header line, follow these steps:

- 3.1. On the **Insert** tab, click **Table**.
- 3.2. In the **Insert Table** window, click **Insert Table** and create the table you want. You can also use some of the built-in MS-Word tables by clicking **Quick Tables**.
- 3.3. Select the table and highlight the row (or rows) you want to define as a header.
- 3.4. On the **Table Tools** tab, click **Layout**.
- 3.5. In the **Data** group, click **Repeat Header Rows**. The header line is also, automatically added on the next page.

Additional tips

- 4.1 Choose fonts that are easy to read and can often be found in documents (e.g., Sans Serif), such as Arial, Verdana, Tahoma, Calibri.
- 4.2 The font size should not be less than 10pt. Recommended document font sizes are between 12pt and 18pt.
- 4.3 Use automatic page numbering. Do not manually type page numbers at the bottom of the page.
- 4.4 Do not use repetitive blank characters (spaces, TAB characters, paragraph characters). People who use screen reader programs may find repetitive blank characters as spaces annoying.
- 4.5 Use the automatic lists (bullets), and numbering to define text lists.
- 4.6 Use MS Word columns to structure your document into columns. Do not use the Tab button to create columns. Also, use enough margin to separate your columns facilitating user with low vision.

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- 4.7 Do not use empty cells, rows, or columns in your tables. Empty cells can mislead people with blindness.
- 4.8 Do not use tables to align text or other objects (e.g., images) within your document. Tables should only be used for data.
- 4.9 Do not underline words, titles, headings, or text.
- 4.10 The font and background color combination should be appropriate to maintain a high color contrast in the document. An example of high color contrast is black font on white background, while light gray / yellow / blue font on white background are low color contrast combinations.

Scientific symbols, multimedia, etc.

If your document contains scientific symbols (such as chemistry or mathematical formulas), [see the relevant guidelines](#).

Check of the accessibility level

MS-Word 2010 includes an Accessibility Checker that examines your document for a range of potential issues that people with disabilities may face. Each problem can be classified into one of the following categories:

- **Error:** As accessibility error is content that is very difficult or impossible to be perceived by people with disabilities.
- **Warning:** As accessibility warning is content that in most, but not all cases, is very difficult to be perceived by people with disabilities.
- **Tips:** As accessibility tip is content that can be perceived by people with disabilities, but it should be better organized or presented in order to maximize the information perceived.

Whenever the Accessibility Checker detects a problem, the Accessibility Checker window displays information about why the content may not be accessible. By selecting the respective problem, instructions on how to fix or revise it are displayed.

How to use the Accessibility Checker:

- 6.1 Click the **File** tab.
- 6.2 Click **Info**.
- 6.3 In the **Prepare for Sharing** area, a notification will appear if the Accessibility Checker has detected any accessibility issues.
- 6.4 If you want to view and fix the problems in your file, click **Check for Issues**, and then click **Check Accessibility**.
- 6.5 Return to your file, where the **Accessibility Checker** window is open and displays the inspection results.
- 6.6 Click on a specific issue to see **Additional Information** on how to fix or revise the content.

[Detailed guidelines for creating accessible documents with MS-Word 2010 for Windows](#)

[Detailed guidelines for creating accessible documents with MS-Word 2011 for Mac](#)

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InSIDE

Including Students with Impairments in Distance Education

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Appendix 6: Quick guidelines for creating accessible documents with MS-Word 2016



InSIDE

Including Students with Impairments in Distance Education

Quick guidelines for creating accessible documents with MS-Word 2016

Use styles for the structure of large documents

The structure of a document usually includes a title (and sometimes a subtitle), which are unique and can only be found on the first page. Also, a text is usually divided into multi-level chapters and sub-chapters where the appropriate heading corresponds.

This rule ensures that the authors have used built-in styles throughout the whole text body, title, subtitle, headings, and paragraphs for documents containing at least 1200 words. Thus, a perceptual structure is created even for users with blindness who use a synthetic speech screen reader program. Headings should be short, i.e., a few words or a short phrase, so that users can easily and quickly navigate the document. Also, the structure of the document should start with Heading1 (first level), and when the level of detail increases, the heading level should also increase, i.e., Headings2 (second level), Headings3, etc., follow Heading1, in order for the document to have a logical structure. It should have been decided in advance how many heading levels will be used, and if/how they will be numbered.

Why? By using styles you can create a coherent structure in your documents, and the use of headings makes the navigation of your document easier. The headings numbering makes it easier for the user to understand the level of the text where he/she is located.

How to use/add: To apply a style to the entire document, follow the next steps:

- 1.1. Select the whole text.
- 1.2. On the **Home** tab, in the **Styles** group, select the style you want for the body text (e.g., Normal or No spacing).
- 1.3. Select the title text.
- 1.4. On the **Home** tab, in the **Styles** group, click on **Title**.
- 1.5. Select the subtitle text.
- 1.6. On the **Home** tab, in the **Styles** group, click on **Subtitle**.

If you want to use the default heading numbering type, move to step 1.10

- 1.7. If you want to set the numbering type for the headings, in the **Home** tab, in the **Styles** group, right-click on **Heading1** and select **Modify Style**.
- 1.8. In the **Modify Style** window, click **Format** and then **Numbering and Bullets**. Select the numbering type that you want and click **OK**.
- 1.9. Repeat the above two steps for all the heading levels you are going to use.
- 1.10. Select the heading text.
- 1.11. On the **Home** tab, in the **Style** group, click the **Heading** that corresponds to the desired level.

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Use alternative text in all objects

This rule ensures that the authors have provided alternative text for the following objects: images, graphs, photographs, data tables, shapes.

Why? Through alternative text, users, even people with blindness, perceive the information presented in images and other objects in alternative ways (such as audio or tactile).

How to fix: To add alternative text to the object, follow these steps:

- 2.5. Right-click on the image/object and select **Format Picture/Object**.
- 2.6. The **Format Picture/Object** window will appear on the right side of the screen. Click **Alt Text** on the **Layout and Properties** icon.
- 2.7. Add a description of the item in the **Description** field. Do not write alternative text in the **Title** field. If the object is an image, the description should start with the word "image" or equivalent (e.g., logo, shape).
- 2.8. For tables, right-click and select **Table Properties**.
- 2.9. In the **Table Properties** window, click **Alt Text**.
- 2.10. Add a description of the item in the **Description** field. Do not write alternative text in the **Title** field.

Note: The above rule is applied in exactly the same way to the following object categories: SmartArt graphics, embedded objects, video and audio files, groups (all objects, except shapes, must have alternative text also when belonging to groups).

Use tables with simple structure and a header line

This rule ensures that authors have used tables with a simple, two-dimensional structure that do not contain merged or split cells and have correctly defined a header line (or lines) for the tables. If the table extends to more than one page, it is necessary to add a header line in it.

Why? The table should have a simple two-dimensional structure and a header line, so that people with disabilities can easily navigate and understand it. Somebody who uses a screen reader program will have difficulty navigating the table in case he/she needs for example to combine the values from two cells to understand the content of the table.

How to add: To add a table with a two-dimensional structure and a header line, follow these steps:

- 3.6. On the **Insert** tab, click **Table**.
- 3.7. In the **Insert Table** window, click **Insert Table** and create the table you want. You can also use some of the built-in MS-Word tables by clicking **Quick Tables**.
- 3.8. Select the table and highlight the row (or rows) you want to define as a header.
- 3.9. On the **Table Tools** tab, click **Layout**.
- 3.10. In the **Data** group, click **Repeat Header Rows**. The header line is also, automatically added on the next page.

Additional tips

- 4.11 Choose fonts that are easy to read and can often be found in documents (e.g., Sans Serif), such as Arial, Verdana, Tahoma, Calibri.
- 4.12 The font size should not be less than 10pt. Recommended document font sizes are between 12pt and 18pt.
- 4.13 Use automatic page numbering. Do not manually type page numbers at the bottom of the page.
- 4.14 Do not use repetitive blank characters (spaces, TAB characters, paragraph characters). People who use screen reader programs may find repetitive blank characters as spaces annoying.
- 4.15 Use the automatic lists (bullets), and numbering to define text lists.

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- 4.16** Use MS Word columns to structure your document into columns. Do not use the Tab button to create columns. Also, use enough margin to separate your columns facilitating user with low vision.
- 4.17** Do not use empty cells, rows, or columns in your tables. Empty cells can mislead people with blindness.
- 4.18** Do not use tables to align text or other objects (e.g., images) within your document. Tables should only be used for data.
- 4.19** Do not underline words, titles, headings, or text.
- 4.20** The font and background color combination should be appropriate to maintain a high color contrast in the document. An example of high color contrast is: black font on white background, while light gray / yellow / blue font on white background are low color contrast combinations.

Use scientific symbols, multimedia, etc.

If your document contains scientific symbols (such as chemistry or mathematical formulas), [see the relevant guidelines](#).

Check of the accessibility level

MS-Word 2016 includes an Accessibility Checker that examines your document for a range of potential issues that people with disabilities may face. Each problem can be classified into one of the following categories:

- **Error:** As accessibility error is content that is very difficult or impossible to be perceived by people with disabilities.
- **Warning:** As accessibility warning is content that in most, but not all cases, is very difficult to be perceived by people with disabilities.
- **Tips:** As accessibility tip is content that can be perceived by people with disabilities, but it should be better organized or presented in order to maximize the information perceived.

Whenever the Accessibility Checker detects a problem, the **Accessibility Checker** window displays information about why the content may not be accessible. By selecting the respective problem, instructions on how to fix or revise it are displayed.

How to use the Accessibility Checker:

- 6.7** Click the **File** tab.
- 6.8** Click **Info**.
- 6.9** If you want to view and fix the problems in your file, click **Check for Issues**, and then click **Check Accessibility**.
- 6.10** Return to your file, where the **Accessibility Checker** window is open and displays the inspection results.
- 6.11** Click on a specific issue to see **Additional Information** on how to fix or revise the content.

[Detailed guidelines for creating accessible documents with MS-Word 2016 for Windows](#)

[Detailed guidelines for creating accessible documents with MS-Word 2016 for Mac](#)

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Appendix 7: Quick guidelines for creating accessible documents with LibreOffice4.0 Writer



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Quick guidelines for creating accessible documents with LibreOffice4.0 Writer

Use styles for the structure of large documents

The structure of a document usually includes a title (and sometimes a subtitle), which are unique and can only be found on the first page. Also, a text is usually divided into multi-level chapters and sub-chapters where the appropriate heading corresponds.

This rule ensures that the authors have used built-in styles throughout the whole text body, title, subtitle, headings, and paragraphs for documents containing at least 1200 words. Thus, a perceptual structure is created even for users with blindness who use a synthetic speech screen reader program. Headings should be short, i.e., a few words or a short phrase, so that users can easily and quickly navigate the document. Also, the structure of the document should start with Heading1 (first level), and when the level of detail increases, the heading level should also increase, i.e., Headings2 (second level), Headings3, etc., follow Heading1, in order for the document to have a logical structure. It should have been decided in advance how many heading levels will be used, and if/how they will be numbered.

Why? By using styles you can create a coherent structure in your documents, and the use of headings makes the navigation of your document easier. The headings numbering makes it easier for the user to understand the level of the text where he/she is located.

How to use/add: To apply a style to the entire document, follow the next steps:

- Select the whole text.

A.1.1. Click the **Format** menu and select **Styles and Formatting** or press **F11** so as the **Style and Formatting** window in which you can select **Text Body** to be displayed.

A.1.2. Select the text to be modified into title.

A.1.3. In **Style and Formatting** window, click **Title**.

A.1.4. Select the text to be modified into subtitle.

A.1.5. In **Style and Formatting** window, click **Subtitle**.

If you want to use the built-in headings, go to step 1.10.

A.1.6. If you want to set the numbering type for the headings, click **Tools** menu, select **Outline Numbering**, and in the **Outline Numbering** window that is displayed, select the **Numbering** tab.

A.1.7. Select the number "1" below the **Level** and in the **Paragraph style** option select **Heading1**. In the **Number** option, select the type of numbering you want. In **Character style**, select **Numbering characters**. Then, in the **start from** option, select the number from which you want the numbering to start.

A.1.8. Repeat the abovementioned step for all the headings levels that you will use, each time selecting the appropriate number below the **Level**, e.g.: for Heading2 the number "2" and so on.

A.1.9. Select the text to be modified into heading.

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A.1.10. Click the **Format** menu and select **Styles and Formatting** or press **F11** so as the **Style and Formatting** window to be displayed and then, click the **Header** that corresponds to the desired level.

Use alternative text in all objects

This rule ensures that the authors have provided alternative text for the following objects: images, graphs, photographs, data tables, shapes.

Why? Through alternative text, users, even people with blindness, perceive the information presented in images and other objects in alternative ways (such as audio or tactile).

How to fix: To add alternative text to the object, follow these steps:

- 2.1.** Right-click on the item and select **Description**.
- 2.2.** Enter a brief description of the object in the **Title** field. If you want, you can enter a more detailed description in the **Description** field. If the object is an image, the description should start with the word "image" or equivalent (e.g.: logo, shape).
- 2.3.** When you have finished, click "**OK**".

Use tables with simple structure and a header line

This rule ensures that authors have used tables with a simple, two-dimensional structure that do not contain merged or split cells and have correctly defined a header line (or lines) for the tables. If the table extends to more than one page, it is necessary to add a header line in it.

Why? The table should have a simple two-dimensional structure and a header line, so that people with disabilities can easily navigate and understand it. Somebody who uses a screen reader program will have difficulty navigating the table in case he/she needs for example to combine the values from two cells to understand the content of the table.

How to fix: To add a table with a two-dimensional structure and a header line, follow these steps:

- 3.1.** Click the **Table** menu, select **Insert**, and then select **Table**.
- 3.2.** In the **Insert Table** window, select the number of columns and rows to create the table you want. You can also use some of the ready-made LibreOffice Writer tables by clicking **Auto format**.
- 3.3.** Right-click on the table and from the menu that opens click **Table**.
- 3.4.** In the **Table format** window, on the **Text flow** tab, click **Repeat header** and select how many rows will be repeated as a header. The header is automatically inserted on the next page.

Additional tips

- Choose fonts that are easy to read and can often be found in documents (e.g., Sans Serif), such as Arial, Verdana, Tahoma, Calibri.

A.2.1 The font size should not be less than 10pt. Recommended document font sizes are between 12pt and 18pt.

A.2.2 Use automatic page numbering. Do not manually type page numbers at the bottom of the page.

A.2.3 Do not use repetitive blank characters (spaces, TAB characters, paragraph characters). People who use screen reader programs may find repetitive blank characters as spaces

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annoying. If they hear a lot of " spaces", users may think they have reached the end of the document.

A.2.4 Use the automatic lists (bullets), and numbering to define text lists.

A.2.5 Use the built-in columns to structure your document into columns. Do not use the Tab button to create columns. Also, use enough margin to separate your columns facilitating user with low vision.

A.2.6 Do not use empty cells, rows, or columns in your tables. Empty cells can mislead people with blindness.

A.2.7 Do not create table-like structures using the Tab button or blank characters.

A.2.8 Do not use tables to align text or other objects (e.g., images) within your document. Tables should only be used for data.

A.2.9 Do not underline words, titles, headings, or text.

A.2.10 The font and background color combination should be appropriate to maintain a high color contrast in the document. An example of high color contrast is black font on white background, while light gray / yellow / blue font on white background are low color contrast combinations.

Scientific symbols, multimedia, etc.

If your document contains scientific symbols (such as chemistry or mathematical formulas), audio or video files, complex data tables, or a combination of texts in multiple languages, [see the relevant guidelines](#).

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Appendix 8: Quick guidelines for creating accessible PDF files from accessible MS-Word & MS-PowerPoint 2010



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Quick guidelines for creating accessible PDF files from accessible MS-Word & MS-PowerPoint 2010

A. By using a special plug-in

The «ZHAW PowerPoint and Word Accessibility» add-on used as a plug-in in MS Word 2010 και MS PowerPoint 2010 applications, checks your document for a range of potential problems that people with disabilities may face and creates corresponding accessible PDF files. Each issue is classified into one of the following categories:

- **Accessibility Issue:** An accessibility issue is an issue that is very difficult or impossible to be perceived by people with disabilities.
- **Warning:** An accessibility warning is an issue that can be very difficult for people with disabilities to perceive it.
- **Question:** An accessibility question is an issue that may not be perceived by people with disabilities.

Plug-in Installation Instructions

- 1.12. Click on the link below: <http://access.uoa.gr/ATHENA/gre/pages/download/837>
- 1.13. Download the «ZHAW PowerPoint and Word Accessibility» plug-in.
- 1.14. Unzip the file to a folder of your choice.
- 1.15. Make sure you have closed MS Word 2010 and MS PowerPoint 2010.
- 1.16. Double-click the MSOfficeAccessibilityAddInsSetup.msi executable file.
- 1.17. Follow the installation instructions on the screen.
- 1.18. After the plug-in is successfully installed, restart Microsoft Word 2010. You will notice that a new tab called Accessibility has appeared.
- 1.19. Clicking the Accessibility tab the available plug-in options are displayed.
- 1.20. Click Settings and make sure all available options are selected on the Accessibility Checker tab.
- 1.21. Click OK to close the window.

Creation of accessible MS-Word or MS-PowerPoint file

- 3.11. Follow the quick guidelines for creating accessible documents with MS-Word 2010 or the quick guidelines for creating accessible presentations with MS-PowerPoint 2010.

Accessibility Check

- A.2.1. Click the **Accessibility** tab.
- A.2.2. Click **Check Document**.

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- A.2.3.** Each time Accessibility Check detects an issue, the task window displays information about why the content may not be accessible. By selecting the specific issue, instructions are displayed on how to fix or revise it.
- A.2.4.** Click **Apply** to complete the correction of an error or warning.

Document Conversion to PDF

- 4.21** Click the **Accessibility** tab.
- 4.22** Click **Create Accessible PDF**.

If you want to lock your document with a password using Adobe Acrobat, make sure you have the option to enable text access for screen readers by following the instructions below:

- 4.23** Click **Tools** and then, in the right column of the application, click the **Protection** menu.
- 4.24** Click More Protection and then **Security Properties**.
- 4.25** On the **Security** tab, click the **Security Method** menu and select **Password Security**.
- 4.26** In the **Permissions** area, click **Restrict editing and printing of the document**.
- 4.27** Make sure **Enable text access for screen reader devices for the visually impaired** is selected.

B. Without using a special plug-in

Creation of accessible MS-Word or MS-PowerPoint file

- B.1.1** A.1.1. Follow the quick guidelines for creating accessible documents with MS-Word 2010 or the quick guidelines for creating accessible presentations with MS-PowerPoint 2010.

Document Conversion to PDF

First way:

- B.2.1-a** Click the **File** tab of MS-Word 2010 or MS-PowerPoint 2010.
- B.2.2-a** Click **Save As**.
- B.2.3-a** From the Save As menu, select PDF (*. Pdf).

Second way:

If you want to convert the document into PDF using Adobe Acrobat (provided that it is installed on your computer):

- B.2.1-b** Click the **File** tab.
- B.2.2-b** Click **Save as Adobe PDF**.
- B.2.3-b** If the application ask you to convert the document using Adobe PDF Maker, click **OK**

If you want to lock your document with a password using Adobe Acrobat, make sure you have the option to enable text access for screen readers by following the instructions below:

- B.2.4-b** Click **Tools** and then, in the right column of the application, click the **Protection** menu.
- B.2.5-b** Click More Protection and then **Security Properties**.
- B.2.6-b** On the **Security** tab, click the **Security Method** menu and select **Password Security**.
- B.2.7-b** In the **Permissions** area, click **Restrict editing and printing of the document**.
- B.2.8-b** Make sure **Enable text access for screen reader devices for the visually impaired** is selected.

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Accessibility Check

In case you want to check the accessibility of your PDF document, follow the steps below:

- B.3.1.** Click on the link below: <http://access.uoa.gr/ATHENA/gre/pages/download/261>
- B.3.2.** Download the "PAC-PDF Accessibility Checker".
- B.3.3.** Unzip the file to a folder of your choice.
- B.3.4.** Double-click the **PAC.exe** executable file.

Note: It is necessary the PAC.exe and paclib.dll files to be in the same folder.

- B.3.5.** In the window that appears, click **Browse**.
- B.3.6.** Select the **PDF** document which you want to check for its accessibility, and then click Open.
- B.3.7.** Click **Start Check**.
- B.3.8.** When the accessibility check is complete, click **Report**, where a complete detailed report on the accessibility of the PDF document is provided.
- B.3.9.** The included links facilitate you to navigate through the detailed report. Clicking on the error messages your document will be displayed and the most likely location of the error.

Note: Steps B.3.1-B.3.3 to install the "PAC-PDF Accessibility Checker" are performed only once.

[Detailed guidelines for creating accessible PDF files with Adobe Acrobat](#)

[Detailed guidelines for creating accessible PDF files with Foxit PhantomPDF](#)

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Appendix 9: Quick guidelines for creating accessible PDF documents from LibreOffice4.0 Writer & Impress accessible documents



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Quick guidelines for creating accessible PDF documents from LibreOffice4.0 Writer & Impress accessible documents

To create accessible PDF documents using LibreOffice4.0 Writer/Impress applications follow the steps below:

Creation of accessible LibreOffice Writer/Impress file

A.1.1. Follow the quick guidelines for creating accessible documents with LibreOffice4.0 Writer/Impress.

Document Conversion to PDF

A.2.1 Click the **File** tab

A.2.2 Click **Export as PDF**.

A.2.3 In the dialog box that appears, make sure that the **PDF tagged** and **Bookmark export** options are selected.

A.2.4 Click **Export**.

A.2.5 Select the desired location to save the file and click **Save**.

If you want to lock your document with a password using Adobe Acrobat, make sure you have the option to enable text access for screen readers by following the instructions below:

A.2.6 Click **Tools** and then, in the right column of the application, click the **Protection** menu.

A.2.7 Click More Protection and then **Security Properties**.

A.2.8 On the **Security** tab, click the **Security Method** menu and select **Password Security**.

A.2.9 In the **Permissions** area, click **Restrict editing and printing of the document**.

A.2.10 Make sure **Enable text access for screen reader devices for the visually impaired** is selected.

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Accessibility Check

In case you want to check the accessibility of your PDF document, follow the steps below:

B.1.1 Click on the link below: <http://access.uoa.gr/ATHENA/gre/pages/download/261>

B.1.2 Download the "PAC-PDF Accessibility Checker".

B.1.3 Unzip the file to a folder of your choice.

B.1.4 Double-click the **PAC.exe** executable file.

*Note: It is necessary the **PAC.exe** and **paclib.dll** files to be in the same folder.*

B.1.5 In the window that appears, click **Browse**.

B.1.6 Select the **PDF** document which you want to check for its accessibility, and then click Open.

B.1.7 Click **Start Check**.

B.1.8 When the accessibility check is complete, click **Report**, where a complete detailed report on the accessibility of the PDF document is provided.

B.1.9 The included links facilitate you to navigate through the detailed report. Clicking on the error messages your document will be displayed and the most likely location of the error.

Note: Steps B.3.1-B.3.3 to install the "PAC-PDF Accessibility Checker" are performed only once.

[Detailed guidelines for creating accessible PDF files with Adobe Acrobat](#)

[Detailed guidelines for creating accessible PDF files with Foxit PhantomPDF](#)

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Appendix 10: Quick guidelines for creating accessible presentations with MS-PowerPoint 2010



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Quick guidelines for creating accessible presentations with MS-PowerPoint 2010

Alternative text to all objects

This rule ensures that the authors have provided alternative text for the following objects: images, ClipArt images, graphs, photos, data tables, shapes (that do not contain text and do not belong to groups), SmartArt graphics, embedded objects, video and audio files, groups (all items in this list, except shapes, should also contain alternate text when they belong to groups).

Why? With alternative text, users, even those with vision loss, perceive the information presented in images and other objects in alternative ways (such as through an audio or tactile way).

How to fix: To add alternative text to the object, follow the steps below:

- 1.1. Right-click on the object and select **Format Picture**.
- 1.2. Click **Alt Text**.
- 1.3. Enter a description of the item in the **Description** text field. Do not enter alternative text in the **Title** field. If the object is an image, the description should start with the word "image" or equivalent (e.g.: logo, shape).
- 1.4. When you have finished, click "**Close**".

Unique titles to all slides

This rule ensures that the authors have correctly included a title for each presentation slide.

Why? Slide titles are used for navigation and selection by those who cannot see the slide.

How to fix: To add visible titles to the slides, follow the steps below:

- 2.1. Click the **Reset** button on the **Home** tab to reset the placeholder symbols for the selected slide.
- 2.2. Enter a unique name in the **Title** text box.

If you do not want the title you created above to be visible on the slide, follow the steps below:

- 2.3. Click the **Arrange** menu, located in the **Drawing** group, on the **Home** tab.
- 2.4. Click the **Selection Pane**.
- 2.5. Click the eye icon next to the text box of the slide title to make it appear or disappear.

Logical reading order to all slides

This rule ensures that whenever authors use objects that do not belong to the slide prototype, the reading order of the slide context makes sense. This is a very important rule, which highlights all slides containing similar objects.

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Why? Those who do not see the slide will be able to hear the text of the slide, the shapes and their content be described in a specific order. Do not forget to check that the reading order and the labels make sense.

How to fix: To check the order in which the content will be read, follow the steps below:

3.1. On the **Home** tab, in the **Drawing** group, click **Arrange** and select the **Selection Pane**.

3.2. The slide objects appear in the Selection window. The objects reading starts from the last item in the list and ends at the first item in the list. With the **Re-order** arrows at the bottom of the window you can modify any item that is not in the right order.

Increase/Improve visibility for users with color blindness

This rule ensures that users with color blindness, who cannot distinguish colors, can perceive what they see if elements that increase visual contrast are used.

Why? Users with color blindness cannot perceive the difference in a text that is used red and green colour.

How to fix:

4.1 Avoid using red, green, and orange colour on slides and text.

4.2 Use different textures in graphics, instead of different colors, where you want to emphasize something.

4.3 Circle the information you want to highlight, instead of using color or laser pointer during the presentation.

4.4 Maintain high color contrast in the whole presentation.

Use of scientific symbols, multimedia, multiple languages

If your slides contain scientific symbols (such as chemistry or mathematical formulas), audio or video files, composite datasets, or text combinations in multiple languages, [see the relevant guidelines](#).

Accessibility check

The 2010 version of MS-Office includes the Accessibility Checker tool that examines your slides for a range of potential issues that users with disabilities may face. Each issue is classified into one of the following categories:

- **Errors:** As accessibility error is defined a content that is very difficult or impossible to be perceived by people with disabilities.
- **Warning:** As accessibility warning is defined a content that in most, but not all cases, is very difficult to be perceived by people with disabilities.
- **Tips:** As accessibility tip is defined a content that can be perceived by people with disabilities, but it should be better organized or presented in order to maximize the information perceived.

Whenever the Accessibility Checker detects a problem, the Accessibility Checker window displays information about why the content may not be accessible. By selecting the respective problem, instructions on how to fix or revise it are displayed.

How to use the Accessibility Checker:

6.1 Click the **File** tab.

6.2 Click **Info**.

6.3 In the **Prepare for Sharing** area, a notification will appear if the Accessibility Checker has detected any accessibility issues.

6.4 If you want to view and fix the problems in your file, click **Check for Issues**, and then click **Check Accessibility**.

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- 6.5** Return to your file, where the **Accessibility Checker** window is open and displays the inspection results.
- 6.6** Click on a specific issue to see **Additional Information** on how to fix or revise the content.

[Detailed guidelines for creating accessible presentations with MS-PowerPoint 2010](#)

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Appendix 11: Quick guidelines for creating accessible presentations with LibreOffice4.0 Impress



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Quick guidelines for creating accessible presentations with LibreOffice4.0 Impress

Alternative text to all objects

This rule ensures that the authors have provided alternative text for the following objects: images, ClipArt images, graphs, photos, data tables, shapes (that do not contain text and do not belong to groups), SmartArt graphics, embedded objects, video and audio files, groups (all items in this list, except shapes, should also contain alternate text when they belong to groups).

Why? With alternative text, users, even those with vision loss, perceive the information presented in images and other objects in alternative ways (such as through an audio or tactile way).

How to fix: To add alternative text to the object, follow the steps below:

- Right-click on the object and select **Description**.
- 2.4. Enter a description of the item in the **Title** text field. If you want, you can enter a more detailed description in the **Description** field. If the object is an image, the description must start with the word "image" or equivalent (e.g.: logo, shape).
- 2.5. When you have finished click on "OK".

Unique titles to all slides

This rule ensures that the authors have correctly included a title for each presentation slide.

Why? Slide titles are used for navigation and selection by those who cannot see the slide.

How to fix: Use embedded slide layouts that already contain a Title text box. Enter a unique title in the text box that corresponds to the Title.

Logical reading order to all slides

This rule ensures that whenever authors use objects that do not belong to the slide prototype, the reading order of the slide context makes sense. This is a very important rule, which highlights all slides containing similar objects.

Why? Those who do not see the slide will be able to hear the text of the slide, the shapes and their content be described in a specific order. Do not forget to check that the reading order and the labels make sense.

How to fix: Use embedded slide layouts because they are more accessible to those who use assistive technology. For example, the order of reading on a Slide with Title and Objects is the Title to be read first and then the other objects, moving from left to right and from top to bottom.

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Increase/Improve visibility for users with color blindness

This rule ensures that users with color blindness, who cannot distinguish colors, can perceive what they see if elements that increase visual/colour contrast are used.

Why? Users with color blindness cannot perceive the difference in a text that is used red and green colour.

How:

- 4.1** Avoid using red, green, and orange colour on slides and text.
- 4.2** Use different textures in graphics, instead of different colors, where you want to emphasize something.
- 4.3** Circle the information you want to highlight, instead of using color or laser pointer during the presentation.
- 4.4** Maintain high color contrast in the whole presentation.

Use of scientific symbols, multimedia, multiple languages

If your slides contain scientific symbols (such as chemistry or mathematical formulas), audio or video files, composite datasets, or text combinations in multiple languages, [see the relevant guidelines](#).

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InSIDE “Including Students with Impairments in Distance Education” is a project co-financed under the Erasmus+ Programme, Key Activity KA2: Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education (Project No. 598763-EPP-1-2018-1-EL-EPPKA2-CBHE-JP) with three university partners from Europe and eleven university partners from Algeria, Morocco and Tunisia (Partner Countries).

Co-funded by the
Erasmus+ Programme
of the European Union



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