

Teaching English to Visually Impaired Learners

Session 2. Tools and Resources

Computer Applications

An application is any software, game or App that can be used in an ICT hardware. Accessibility in ICT means that the user can use a tool or application autonomously, obtaining the results for which it was designed. Let us introduce the type of applications we normally use, the meaning for blind and VI learners and the need of assessing their accessibility to ensure their participation.

Types of Applications, considering their use by a VI learner

Voice-guided applications

Voice-guided applications are those ones designed to be accessible in themselves, many times with natural voices, without requiring a screen reader. It is the application itself that, explicitly or intuitively, guides the student through the information and activities. This is the type of application that is most commonly used in early childhood education and the first years of primary school. In these applications, every element must have a voiceover or sound illustration that offers the exact information that the student requires due to their lack of vision, each screen or activity must have a presentation of it, each change of activity must be announced and all of them must have feedback sounds each time the student performs an action. In applications aimed at these ages we often find activities based on relationship, association or classification of elements that the child usually completes using a graphics tablet (A **graphics tablet**, also known as a **digitizer**, **digital graphic tablet**, **pen tablet**, **drawing tablet**, **external drawing pad** or **digital art board**, is a computer input device that enables a user to hand draw or paint images, animations and graphics, with a special pen-like stylus, similar to the way a person draws pictures with a pencil and paper by hand. [Wikipedia](#)).

These are examples of voice-guided applications. As you will see in the examples, there are sounds and voices that guide the navigation and the activities. The difference between blind and

sighted learners in this case is that the latter use the mouse to reach the objective, while the blind learner must use the keyboard to do so, or, in case of some interactive activities, they will need a digital tablet. But is this enough? Let us see in these examples how difficult or even impossible it is to use such simple games for a blind student. To do so, you just can open the game and try to play with it with the screen unplugged or with your eyes closed.

- [Alma on the case](#)
- [Adaptedmind](#)
- [Sesamestreet_babyanimals](#)
- [Sesamestreet_sounds](#)

Non-Voice-guided applications

These are those that can be used with a screen reader and, when appropriate, with the braille display. In these applications, all elements must have their corresponding label so that they can be captured by the typhlotechnical tools, the focus must reach all the significant elements of the exercise, they must have a number of links that is not excessive, and they must have a page presentation that can be read by the screen reader.

Here you can find two examples of non-voice guided applications. When opening them, there are no voices or sounds to guide the activity. A sighted learner just looking at the screen can work out what they must do. In the case of blind students, they can manage the website with a screen reader, but only if the site is well programmed to do so.

- [Freerice.com](#)
- [Kahoot_Coping With Stress](#)

Evaluation of the accessibility of applications

To evaluate an application, we must put ourselves in the shoes of the student, understanding the functionality of their disability.

If you need more information about the functional features of the different visual pathologies, you can read the document “Students’ needs associated with each type of VI” of this course.

Nowadays there are very few activities and programs that are fully accessible to visually impaired students, especially if they are Braille readers. But at the same time, other applications are increasingly being developed, especially for tablets or mobile devices to help people without vision in different aspects of their lives.

We must evaluate the App or Website both for blind and low vision students. For the former, we may need to use the screen reader to assess some features. It can be downloaded from this Website: [Jaws](#). You can download a trial version with all the features of the normal version, but only runs for 40 minutes each time you use it.

For more information about the use of Jaws, watch this [video](#).

For more information about Accessibility Testing Tutorial and Accessibility Testing Tools, watch [this video](#).

Let us describe some of the issues to consider when assessing the accessibility of applications.

Comprehension

Activities should have a title or instructions of what to do and how it should be done. If there is no explanation, but the rest of it is accessible, the teacher can provide the student with the necessary explanation.

The objective

Sometimes an activity is apparently accessible, but its objective is not suitable for a blind student. We must then ask ourselves if there is an equivalent objective that the student can achieve with the same activity. For example, a Memory Game has the objective of developing visual memory; obviously, this objective does not make sense for a totally blind child. However, we should consider whether the student could reach an equivalent objective with the same activity, such as the development of their auditory or tactile memory.

Navigation

An accessible application must have the possibility of being operated using both the mouse and the keyboard. However, there are some applications that are not accessible to navigate, but do contain some accessible activities. In this case, the teacher can help by creating direct access from the desktop to the accessible activities or by placing the student in the specific activity to be carried out.

Tabulation order

The website or application must have an adequate number of links that will not tire the student during the search and the tabulation order must be appropriate. If not, it will need to be tested to check whether the student will be able to use it. Many apps can be used with useful hotkeys or key combinations. When using Windows and Jaws, the keys F5, F6 and F7 are very useful if the website is well programmed.

Event sounds

The students need to be aware that they have pressed an element, i.e. selected it, opened a new screen, or finalized a selection. In each case, there must be an event sound that indicates what has happened to the user.

Location of elements on the screen

This is important for students with low vision. If the elements are not adequately located but can be identified, we can help the student to identify them the first time, and subsequently they can interact normally with them.

Alternative text on images

The importance of this feature will depend on the specific importance that the picture has in the activity.

Continuity messages

In the case of a pause or attention loss, the blind student needs a message to remind them that the application is still active. However, if this does not occur, the adult will need to refocus the student's attention.

Loading message

When the application is loading or performing some internal function, there must be a waiting information message, for example, "please wait", "the game is loading", but which can be replaced by a message from the adult.

Music in the background

Whenever there is background music, we must ensure that its volume does not interfere with the voice of the screen reader, or any other sounds needed in the activity.

Size and contrast

It should be possible to change them in the application or follow the user's default settings.

Conclusion

Once the activity has been assessed, we will know to what degree the student will be able to access it autonomously, if they will need help to interact with some parts of it or if they will not be able to use it at all.

Possible applications to evaluate

Websites, educational platforms, university virtual campus

Websites and platforms that host educational content are generally non-voice-guiding applications, so they work with a screen reader, but the activities included in them can be both, voice-guiding or non-voice-guiding.

They are made in different ways, with different resources and formats, but they all share a language in their code, known by programmers, which allows them to be made accessible to screen readers.

There are tools to assess their accessibility and companies that certify it, but this certification, unfortunately, does not guarantee that their content can be used appropriately.

To ensure appropriate use, accessibility in navigation, understanding of the structure, ease of use, access to content and interaction, when necessary, should be guaranteed.

When a website is well designed and structured, it can be used with a screen reader, by means of an audio keyboard and with the braille display.

Our students may have a basic understanding of the screen reader, but they will not always be experienced in the use of technology. We can provide them with some basic knowledge about the use of the screen reader on a Web page.

Most common keyboard shortcuts for web browsing with Jaws

Navigation commands: to move forward over specific elements, press specific letters; to go back, press the shift key and the same letter:

- **Links:** to go through all links, press tab. Links already visited: V; unvisited links: U. In some pages, you can see the list of all the links, if you are using JAWS, with the key combination

INSERT + F7. You can go through the list with the up and down arrows or, if you know the name of the link you are looking for, type its initial. To exit the list: ESC.

- **Headers:** H. navigates through the titles on a web page. It is circular, so, once all the headers have been read, it returns to the first one.
- **Forms:** F
- **Editing boxes:** E. To be able to write in the editing box, you must be inside it, pressing enter. Once inside, Jaws notifies with a sound that the user can start writing.
- **Tables:** T: Navigate through tables: ALT+ arrows (up/down or right/left)

General Windows and Jaws commands that are not specific to web pages, but help navigation

- **Reading:**
 - Down arrow: read by lines.
 - Control+down arrow: read by paragraphs.
 - Insert+down arrow: read continuously.
- **Select:** Same as reading, but adding the shift key:
 - Shift+control+right arrow, selects the word to the right of the cursor.
 - Shift+control+down arrow: selects the paragraph where the cursor is.
- **Actions with selected elements:**
 - Copy: control + C.
 - Paste: control + V.
 - Special paste (delete unnecessary elements): Control+Alt+G.
- **Move between internet tabs:**
 - Open new tab: Control+T.
 - Move between open applications: Alt+tab
 - Close tab: control+F4
- **Close program:** alt+F4
- **Mute Jaws:** Temporarily: control. This is very useful when entering the Web, since, if you do not press this key, you would read the entire content of the Web in one go.
- **Activate and deactivate the Jaws cursor:** Insert+Z, necessary for some Web pages.

- **Change the Jaws speech speed:** Control+alt+forward or back key.
- **Choose reader language:** control+Windows+L

Examples of educational web pages with keyboard shortcuts

Normally, pages with interactive activities, such as drag and drop exercises, are more difficult to access, while those based on reading information are usually easier to use.

An example of the former would be the learnenglishteens website, whose navigation and exercises are mostly accessible, but some fill-in-the-blank or drag and drop exercises cannot be done with a screen reader. In this case, the alternative would be to do them in a group or individually on paper. <https://learnenglishteens.britishcouncil.org/>

Let us see an example of an information page that can be used with very few keystrokes and a few keyboard shortcuts:

- Neuroscience for kids is a website with lots of interesting pages that can be easily read using just the cursor keys. <https://faculty.washington.edu/chudler/neurok.html>
- Web page about animal senses: [Neuroscience for Kids - Animal Senses \(washington.edu\)](https://faculty.washington.edu/chudler/neurok.html)
 - It consists of a list, presented in a table, of 50 animals and some characteristics about their senses.
 - You will find a table with 5 columns. One of them is a separation column and has nothing. The others are read as a list, so you can simply navigate by reading with the down and up arrows.
 - To search for the name of a specific animal: Press control+f: write the name of the animal and press enter. It will take you to the name of the animal you were looking for. To continue reading its characteristics, press the down arrow.

Games for iPad and other tablets

You may want to recommend some games to your young learners to play on their mobile devices. Games are often useful for low vision learners, both in terms of learning and motivation, but the majority are inaccessible to blind learners. However, the following list of games are accessible to all:

- [Crossword Puzzles](#)
- [8 Best Mobile Games for Blind and Visually Impaired Players: 2024 Edition](#)

- [5 great mobile games for blind people](#)
- [Blindfold Games](#)

YouTube videos:

To access the videos, sometimes you have to click the tab key until you reach “Skip add” or “play” and press enter.

- [The best animal senses video](#)
- [How your nose works video](#)
- [How your skin works video](#)
- [What is it like to be COLOUR BLIND? | Newsround - YouTube](#)

How to evaluate an App’s accessibility

To make a quick evaluation of the accessibility of an educative application, we can use the documents verification lists from Annexes 1 and 2.

Conclusion

An App, activity or a website can be:

- **Totally inaccessible:** Impossible for blind student to use.
- **Partially accessible:** When it can be used with some help to navigate, understand or manage certain parts of it. The student will be able to use it with the assistance of another classmate, the teacher or another adult.
- **Totally accessible:** The app allows the student to understand, navigate and carry out all the activities with the tools they use to manage the computer.

The teacher may need to help the student to access the app, resolve some accessibility issues or give the student the information or exercise in a different way.

ANNEX 1

ACCESSIBILITY VERIFICATION LIST FOR VOICE-GUIDED APPLICATIONS

To check the accessibility of a voice-guided application, you shouldn't need any tool different from your computer or mobile device.

APPLICATION DATA

| | |
|---------------|--|
| NAME: | |
| DEVELOPED BY: | |
| WEB ADDRESS: | |

EVALUATION TABLE

| CHECKPOINT | YES | NO | OBSERVATION |
|---|-----|----|-------------|
| Can be operated with keyboard | | | |
| All screens have an identifying title with an associated phrase. | | | |
| Navigation through the different objects follows a logical tab order. | | | |
| The graphic elements (photographs, drawings, etc.) have a sound description of their content. | | | |
| The buttons have an audible description of the action they perform. | | | |
| The content of the text blocks has an associated phrase. | | | |
| The videos have a sound description. | | | |
| The videos have subtitles | | | |

| | | | |
|---|--|--|--|
| Any change that occurs on the screen is informed to the user audibly. | | | |
| The common elements to all screens have the same location in each of them. | | | |
| <i>All screens have a menu that allows access to each of the sections of the application.</i> | | | |
| <i>Pedagogical activities inform of their objective before they begin.</i> | | | |

ANNEX 2

ACCESSIBILITY VERIFICATION LIST FOR NON-VOICE-GUIDED APPLICATIONS

To check the accessibility of a non-voice-guided application, our device should be equipped with all the tools used by a blind learner.

To move through the applications, you will need to use a screen reader that narrates the content displayed. Each operating system has its specific screen reader, such as: TalkBack for Android, Voice Over for Apple (already incorporated into the devices themselves); and mainly Jaws and NVDA for Windows (need to be installed).

Jaws: <https://support.freedomscientific.com/Downloads/JAWS>

NVDA: <https://www.nvaccess.org/download/>

Once these tools are installed you can start verifying the accessibility of the application.

APPLICATION DATA

| | |
|---------------|--|
| NAME: | |
| DEVELOPED BY: | |
| WEB ADDRESS: | |

EVALUATION TABLE

| CHECKPOINT | YES | NO | OBSERVATIONS |
|--|-----|----|--------------|
| Can be operated with the keyboard | | | |
| Can be run in full screen | | | |
| All screens have an identifying title. | | | |
| All screens have a number and arrangement of links that make navigation through them agile and simple. | | | |

| | | | |
|---|--|--|--|
| Navigation through the different buttons and/or links follows a logical tab order. | | | |
| Graphic elements (photographs, drawings, etc.) have an alternative textual description | | | |
| The alt text of graphic links clearly defines the action they perform. | | | |
| The texts can be scrolled with the cursor keys. | | | |
| The texts are arranged on a plain coloured background, which contrasts with their colour. | | | |
| The videos have a sound description. | | | |
| The videos have subtitles | | | |
| The common elements to all screens have the same location in each of them. | | | |
| All screens have a menu that allows access to each of the sections of the application, or access to a site map. | | | |
| Each element of a form has its identifying tag correctly associated. | | | |
| In the drop-down lists there is a button that allows you to execute the selected option. | | | |
| Tables have a header row. | | | |
| Pedagogical activities inform of their objective before they begin. | | | |