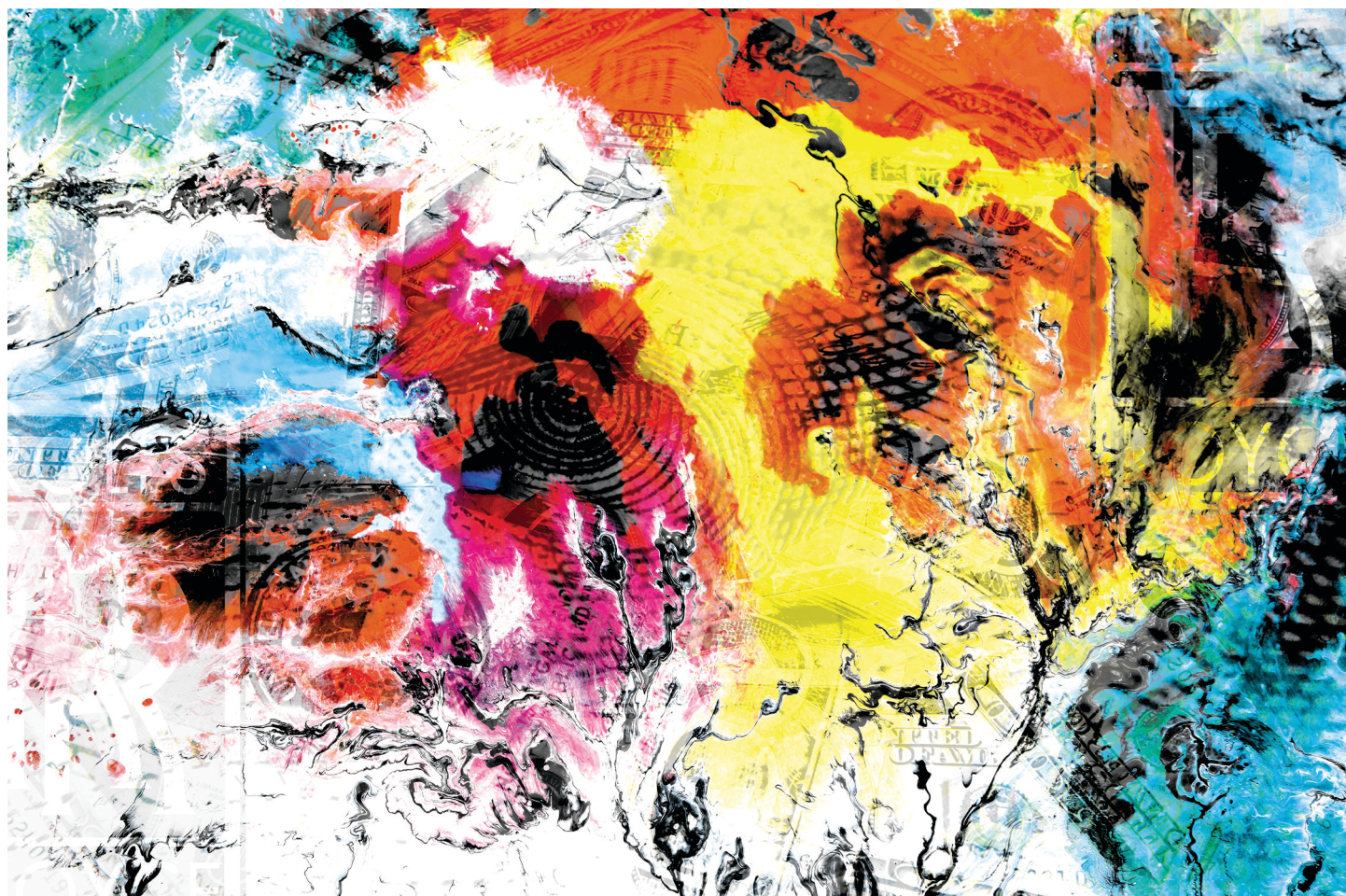


## Assistive technologies and online learning



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# Introduction

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In this free course, *Assistive technologies and online learning*, you will explore some of the technology that disabled students use when accessing computers. We will take a look at the tools and techniques that make it possible for disabled students to engage with online learning.

This OpenLearn course is an adapted extract from the Open University course [H810: Accessible online learning: supporting disabled students](#).

# Learning Outcomes

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After studying this course, you should be able to:

- understand what is meant by assistive technology
- recognise different forms of assistive technology
- understand some students' experiences of using assistive technology.

# 1 What is assistive technology?

In this course, the term 'assistive technology' is used to refer to any technology that makes it possible for a disabled person to use a computer, to make their use of that computer more efficient or to enable them to access online information.

'Assistive technology' can also be used in a wider sense to refer to any technology used by disabled people to enable them to carry out an action or task. 'Enabling technology' is another term used to describe such technology.

Banes and Seale (2002) give the following explanation:

One of the ways in which access to learning resources and teaching material can be facilitated is through the use of specialised technologies often called assistive technology. Assistive technology can be defined as:

equipment and software that are used to maintain or improve the functional capabilities of a person with a disability [Doyle and Robson, 2002, p. 44].

In thinking about how assistive technology can facilitate access to learning resources or teaching material, the focus is on providing access to technologies that will bridge the 'access gap' between the teaching material and the student. The material itself may not have to be altered if appropriate assistive technologies can be utilised.

For students in further and higher education the kinds of assistive technology they may need to use include:

- technology that facilitates access to a standard PC,
- technology that facilitates access to the Internet,
- technology that facilitates access to and manipulation of written word[s],
- technology that facilitates access to and manipulation of spoken word[s],
- technology that helps to compensate for cognitive deficits.

Assistive technology includes hardware such as scanners, adapted keyboards or hearing aids and software such as speech recognition software or thought organisation software. Assistive technology is often associated with high-tech systems such as speech recognition software, but it can include low-tech solutions such as arm rests or wrist guards.

(Banes and Seale, 2002, p. 2.)

## 1.1 What do you know about assistive technology?

In this activity, you will explore a number of different assistive technologies, including IT hardware, non-IT hardware, built-in software, and specialist software. You may be familiar with some of the technologies already.

## Box 1 Assistive technology list

### Information technology hardware

- Chording keyboard
- Keyguard
- Rollerball
- Joystick
- Graphics tablet
- Wheel mouse
- Touch screen
- Switches (with mounting device)
- Video magnifier
- Cassette recorder
- Minidisc recorder
- Digital recorder
- OCR pen
- USB memory stick
- PDA Digital camera
- Camcorder
- Video phone

### Specialist software

- Screen reader
- Magnifier
- Word prediction
- Mind mapping
- Voice recognition
- Icon/toolbar design

### Built-in hardware

- Magnifier
- Sticky keys
- Mouse keys
- Narrator
- On screen keyboard
- Filter keys
- Pointer options
- Toggle keys
- Display properties

### Other hardware

- Adjustable table
- Lap tray

- Table lamp
- Wrist rest
- Foot rest
- Arm support
- Monitor arm
- Document holder

(Adapted from JISC TechDis, undated)

## Activity 1

2 hours

From the technologies listed above:

- make a list of those you haven't heard of before
- make a list of those you have knowledge of.

For each technology, make a note of which impairments you think they address.

Pick four technologies from your list of those that you haven't heard of. Using a search engine, such as Google, explore what they are and how they are used.

### Discussion

This activity gave you an overall sense of the scope of technologies available. The activities that follow will help you to think about the experience of using some of these assistive technologies.

You may have noticed that the list of technologies includes some that are relatively old, such as cassette recorders. It is also rather PC-focused and does not include Mac built-in technologies such as VoiceOver.

In addition, the list does not fully reflect the way in which mainstream technologies may be used by disabled people, such as mobile devices and e-book readers. This reflects the changing nature of technology and its quick pace. Of course some people, perhaps older people, may still be using older technologies such as cassette recorders as they may feel more comfortable and confident with them. However, they are likely to find there are fewer cassettes available.

## 1.2 Lifeskills technologies and curriculum assistive technologies

Another way to break down the different types of assistive technology is in terms of 'lifeskills technologies' and 'curriculum assistive technologies' (JISC TechDis, undated).

Lifeskills assistive technologies are those that aid someone in their daily living (such as Stephen Hawking's text-to-speech software, remote door openers, talking measuring jugs for cooking, tilting chairs for easier access, talking handheld global satellite positioning for blind people or video phones for British sign language users).

Curriculum assistive technologies are those that are only really ever used in a learning context (such as mind mapping software).

There are some technologies that could be included in both categories. For instance, a talking measuring jug is a lifeskill technology for most people but if you are doing a module in catering it becomes a curriculum tool.

## 2 Built-in assistive technology

Personal computer platforms such as Apple Mac OS and Microsoft Windows supply a range of accessibility tools that are built into the operating system or into provided software.

These operating system tools have basic functions that are similar to those in more expensive software, but in some cases they lack some of the features and customisation options that enable disabled people to use a computer with complete independence. Many people with less severe impairments do find these tools useful and they are freely available. They also offer an opportunity for you to try some assistive technology for yourself.

Simple assistive tools are also built into essential software such as web browsers. As an introduction, spend two minutes viewing the video.

Video content is not available in this format.

[TechDis Essentials](#)

TechDis Essentials



Accessibility and web browsers



### 2.1 Trying out built-in assistive technology

In this activity, you will try some assistive technology using tools that come with an operating system.

## Activity 2

Use the resources below to help you find built-in assistive technologies on your electronic devices.

- **Microsoft Windows** – Find detailed tutorials about finding and using built-in assistive technology on the [Microsoft Accessibility website](#) (Microsoft, 2014)
- **Apple OS** – Find similar information on the [Apple Accessibility website](#) (Apple, 2014)
- **Android** – Find similar information on the [Android Accessibility website](#) (Google, 2016).

Try out at least four tools that you are less familiar with, covering the range of types; for example, one each, relating to colour, text size, audio alternatives and not using the mouse. Make notes on your experience of using each of these tools.

- Is it straightforward?
- How long is it taking?
- Do you have to remember the layout of the screen?
- How long do you think it would take you to become an expert user?
- Did you need more help? If so, did you find help and was it useful?

### Discussion

If you are not a technology enthusiast, remember that disabled students may not be either. If you are nervous about trying the assistive technology, so are some disabled students. Think about whether the potential benefits will make the extra effort worthwhile, both for your understanding of assistive technology, and for disabled students.

## 3 Specialist assistive technology

In Activity 2, you tried some assistive technology using tools that come with an operating system. For those students who have sufficient funding, there are more powerful tools. These have features such as customisation for different user needs and different applications. Here we have a look at some of those by listening to some of the students who use them.

Firstly, we should read what students have to say about how these specialist technologies enabled them to participate in online learning:

In the Glasgow Caledonian University Library there is a disability room. This is equipped with items such as large display screens on computers, screen readers, screen magnifiers, scanners, CCTV units to enlarge the print of any document and Braille printers that are invaluable to students with disabilities. The room can also be used for exams where the exam papers are provided in large print or electronic format. I additionally have the use of a computer at home that has all the software installed to enable me to complete the course.

James Owens (SKILL, 2006).

But there are problems that are faced by the students too:

They have done my DSA (Disabled Students' Allowance) assessment, and I'm waiting for approval, which should come through this Friday, then my equipment will be in place. I applied in September but it's taken about a term. I tried to apply earlier but it took ages to get the application form so by the time I sent it, it was too late to have equipment organised for the first term.

Emmanuel Osei-Tutu (SKILL, 2007).

### 3.1 Students' voices on assistive technology

In the following activity, you will spend more time understanding assistive technologies and the issues surrounding them, from the student's perspective.

#### Activity 3

View the following videos:

- [Caroline talks about her experience of using a computer](#) (AbilityNet, 2007)
- [Assistiveware YouTube channel](#) (AssistiveWare, undated) Choose three or four videos that reflect your interests. Most of the videos have subtitles that are indicated by 'CC'; others do not have transcripts or subtitles.
- Students talk about assistive technology provided via Disabled Students' Allowance: [How can DSAs help?](#) (Microlinkvideos, 2012).

As you watch the videos make notes about the differences and similarities between your experience of trying assistive technology and the experiences of the people in the videos.



## Conclusion

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This free course, *Accessible online learning: supporting disabled students*, has introduced some aspects of assistive technologies and how they can support learning. While greater knowledge of each technology is important in providing practical support, we hope this material has introduced you to some of the issues that disabled students experience around the use of assistive technology.

If you are interested in understanding assistive technologies further, and exploring these issues, The Open University offers a course in [Accessibility and Inclusive Learning](#).

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## Acknowledgements

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Adapted extract from: JISC Techdis (undated) *Assistive Technology 'Familiarity Audit'* [online].

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