

When working with an individual to determine the most effective means of accessing assistive technology resources it is, of course, important to remember that each person has individual needs. However, there are a number of common factors to be considered if the identification and implementation of assistive technology resources and systems is to be successful:

Team involvement

This will ensure all relevant issues are discussed and agreed, such as the identification of aims and objectives, positioning of the individual and their equipment, and responsibility for assistance and development of the individual's skills. It will also provide a focus for sharing and developing the skills of the team, including the exchange of information, the opportunity to compromise on specific issues and to learn from a range of professional perspectives.

The team may include: parent/carer, teacher, learning support assistant, speech and language therapist, occupational therapist, physiotherapist, educational psychologist, advisory teacher (e.g. V.I or H.I), social worker and, of course, the individual to be assessed.

In the first instance an open discussion can be fruitful in making sure that the group shares a common set of aims and objectives and is clear about what it is hoped will be achieved.

Cognitive abilities

Considering the cognitive abilities of the individual ensures activities are set at the right level. However, it is often valuable to use an "easy" activity within an assessment context, as the individual will be expected to concentrate and respond to a range of experiences. In addition to demonstrating cognitive understanding of the activity, they will also need to consider developing control of their movements, which will also be significantly demanding.

Once successful access methods are identified and utilised, the individual will have the opportunity to focus on meeting their learning objectives, i.e. concentrating on what they are doing rather than the distraction of how they are doing it.

Sensory abilities

Any indication of sensory impairment, such as hearing loss or visual impairment will have implications for an individual's use of assistive technology. This may impact significantly on the outcomes of the assessment, and should inform on the assessment process. For instance, an individual may be more motivated by auditory feedback if they have a visual impairment. It would therefore be appropriate to ensure that assessment activities are used that take advantage of that particular sensory channel i.e. through use of auditory prompts/cues and/or through delivery of auditory rewards and feedback.

Positioning

For the purpose of using technology, it is important to ensure the individual is positioned in a secure seating system. In addition, consideration should be given to the positioning of equipment in relation to the individual, making it visible (where appropriate) and as accessible as possible. This may require consideration of the use of alternative devices and mounting systems.

Physical access

Accessing is a term used to refer to how an individual works with the assistive technology. Assistive technology can be high tech e.g. computer, environmental control system, or low tech e.g. communication board, E-Tran (eye transfer) frame.

Accurate observation of the individual's physical abilities will help to inform on movements that they can use to access technology. It is essential, wherever possible to involve the individual in this process, as they may have strong opinions of their own. In principle, the movement(s) should be: **voluntary; the easiest; most successful; reliable; repeatable; familiar.**

There are an increasing range of devices and strategies that can be employed to make the use of technology physically easier for an individual with physical disabilities. People with sensory impairments and learning difficulties/disabilities may also benefit from the use of these devices as they can often reduce the cognitive load involved thus enabling the individual to devote more attention to the activity under control. Alternative access devices can include the use of mouse or keyboard alternatives, the use of guards and switches. In addition, strategies such as eye pointing can be utilised in a number of ways to enhance an individual's opportunities to access to technology.

Accessing can be divided into three component parts:

- **Control Interface**

The control interface is the hardware required for the individual to access the assistive technology e.g. keyboard, joystick, and switch. It can also be known as the input device.

- **Selection Set**

The selection set is made up of the items available from which an individual can make a choice e.g. letters, words, symbols. These can be presented in a visual, tactile or auditory way.

- **Selection Method**

The selection method is the method by which the individual makes selections using the control interface. These are two broad methods of selection, direct and indirect.

Direct: Items are selected by direct contact. This could be with the individual's fist, finger, a light pointer, head pointer or by eye pointing. This method requires good motor control. It is usually the quickest method and is cognitively less complex than the alternative, indirect selection.

Indirect: Indirect selection involves intermediary steps to make a selection. The most common form of indirect selection is scanning, but it also includes encoded selection.

Scanning: The individual signals 'stop' when the listener points to the target item or the individual activates the switch when the scan is highlighting the target item. The scan can be of individual items or of rows and columns. When using a switch, the user can either stop an automatic scan or press a switch to step through the choices and press a second switch to select the target item. This second method requires the least motor control, but is slow and can be frustrating. This method also takes time to learn.

Encoding: A method of access used with low-tech systems e.g. communication books and eye pointing. The individual points to two code elements to specify the target item on a pre-coded chart e.g. fist points to a block and then a colour to indicate a particular item within the block. This system is cognitively more complex than direct selection, but requires less motor control.

Variables influencing physical access method of choice:

An individual's physical abilities will affect both the selection method and choice of control interface. Therefore it is important physical abilities are fully assessed. The assessment should consider:

- Does the individual have a controlled voluntary movement?
- How accurate is the chosen movement? This will determine the size of items on the selection set if direct selection is chosen. The size and position of the switch will be affected if indirect selection is being used;
- What is the range of movement? This will determine the position and choice of input devices, e.g. the need for a smaller keyboard if an individual cannot reach all keys on a standard keyboard;
- How repeatable is the movement? An individual will need to repeat the movement over and over again to achieve successful access;
- What strength does the individual have when performing the movement? This will affect the choice of input device;
- Is the individual able to perform the movement quickly / slowly? This could influence the most appropriate selection method and input device;
- Is the individual able to perform the movement at will? When considering single switch use it will be necessary to check that the individual can make a switch activation within a given time frame;
- Is there more than one movement that can be utilised? Different access methods may be required for different assistive technologies
- Is a second movement available? For a potential switch user who does not possess reaction-timing skills, a second movement may be required for two switch scanning.

Environment

An individual's environment can influence the use of technology significantly. Distractions such as noise and light can hamper an individual's concentration and limit their ability to focus on the task. These factors should be considered alongside the need for the individual to be with their peers.

Support

Whilst the use of technology is ultimately aiming to enhance an individual's independence, there is still a need for support in the set-up, training and development of its use. This has many implications for the identification of responsibility for this support. There may be a need for training the person whose responsibility it is to offer the support and the provision of supervision for that person.

Trial of resources and equipment

Whilst an assessment can inform on possible technology solutions to meet an individual's needs, it is likely that the success of the recommendations can only be identified over a period of time. The trial of equipment will establish its potential to 'make a difference'. It is also important to anticipate the possibility of changing needs. The individual may also acquire and develop skills, making the use of recommended resources redundant, or in need of modification.

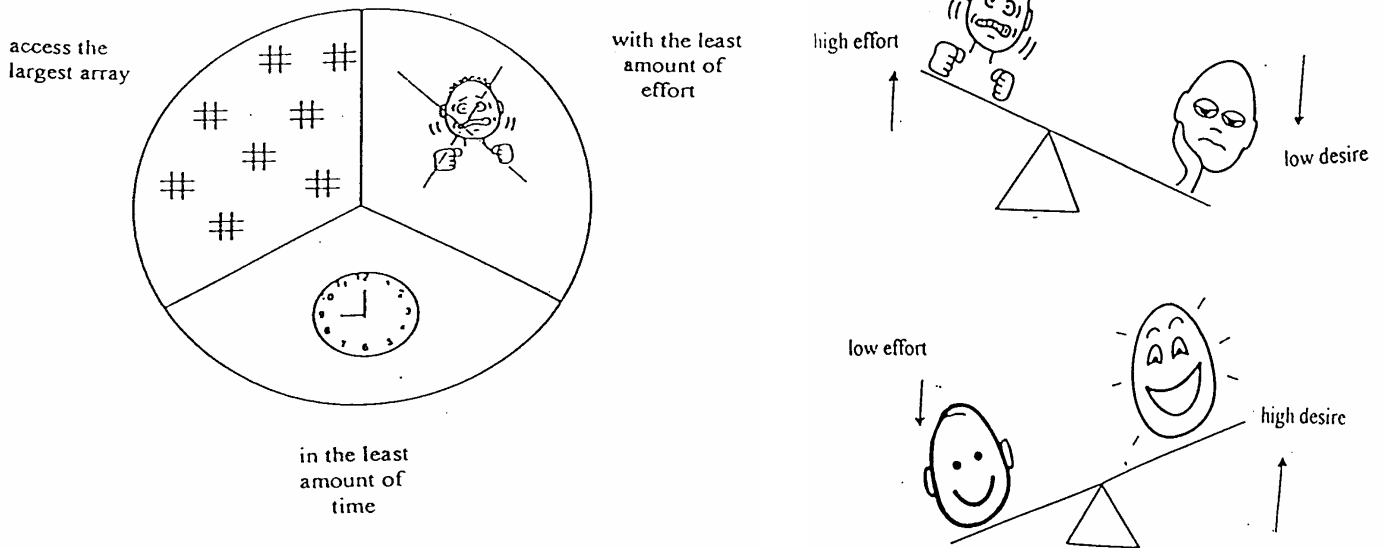
Training

It is important that people who are supporting an individual feel confident about the use of technology they are working with, and are aware of the different ways in which it can be used and developed. It is always desirable to include family and/or carers and friends in training.

Summary

For individuals to be successful with assistive technology resources and systems, the access method chosen need to be one that is the easiest, quickest and most reliable. An individual may have a combination of access methods e.g. eye pointing for communication aid and a switch operated by their head to control the computer.

In short, choose the selection method that allows the individual to.....



Further Reading

Cook and Hussey. (1995) **Assistive Technologies, Principles and Practice** Chapter 6; Mosby.

Pennington et al. (1994) **My Turn to Speak**; Winslow Press.