



Access to technology for pupils with profound and multiple learning difficulties

‘Pupils with profound and multiple learning difficulties have severe and complex learning needs, in addition they have other significant difficulties, such as physical disabilities or a sensory impairment. Pupils require a high level of adult support, both for their learning needs and also for personal care. They are likely to need sensory stimulation and a curriculum broken down into very small steps. Some pupils communicate by gesture, eye pointing or symbols, others by very simple language. Their attainments are likely to remain in the early P scale range (P1-P4) throughout their school careers (that is below Level 1 of the National Curriculum).’

Department for Education

These pupils may need assistive technology to enable them to have control of their environment, to develop early language skills, to make choices, to play and have fun, to develop sensory awareness and to be involved with cooperative activities with others.

Where do we start?

Motivation:

Pupils with profound and multiple learning difficulties may be interested in or motivated by a very limited range of things. To make an accurate assessment of this takes time, but most experienced staff and families have a good idea of what their pupils like.

Music: Any music? All music? Pop – Ed Sheeran or The Queens of the Stone Age? Classical – Mozart or Shostakovich? Folk songs? Gregorian chant? Opera? Bollywood? etc etc. Have they been exposed to different types and shown preferences? Do they prefer it as loud as possible or very quietly? Can they wear headphones? Do they prefer you singing to recorded sound?

Pictures: Familiar ones – family and friends? Animals? Abstract designs? Rembrandt? Are these displayed on the wall or in a photo album? Are they in the form of slides on the whiteboard? Are you using matt laminate to avoid the light reflecting off the picture and making it impossible to see?

Lights and visual stimuli: Preferred colours? In the classroom or in the sensory room? Do they respond better to particular patterns or devices? Can they see some colours better than others?

Tactile stimuli: Preferred materials? Do they like massage? If so is it just in a particular place or in a particular way? Do they respond to vibration? Do they like to touch things or have things touch them?

Sound: Do they respond to loud noises – cars, Hoovers, washing machines etc? Or do they think it's funny if you whisper? Do they recognise familiar people's voices even if they do not understand the language?

Taste: Chocolate? Curry? Grapefruit juice? Etc etc.

(A formal way of assessing pre-intentional communication, including likes and dislikes is laid out in the 'Affective Communication Assessment' – Coupe et al, Manchester 1985. Reference is made to this in 'Communication Before Speech' 2nd Edition – Coupe-O'Kane and Goldbart, David Fulton 1998.

'Routes for Learning', published by the Welsh Government, is a useful assessment tool for all pupils working at these early stages. This can be accessed via <http://tinyurl.com/jq3xqns>.

How to access it?

Once a list of interests and motivating activities has been assembled then we have to think about the other things that may affect the pupils' access to technology. The two easiest and most direct are using switches and touchscreens.

Touchscreens

Touchscreen monitors, plasma screens, interactive whiteboards, tablet computers, iPads, iPod touches and other devices all have touchscreens. For a pupil with PMLD, this may be the most rewarding or motivating activity to start with. Firstly, the concept of cause and effect is direct: I touch something and something happens. Either the response is so big that everyone can see it (whiteboards and plasma screens) or close enough to me that I am able to concentrate easily (tablets and iPads).

However, some pupils may not be able to use their hands in a way that makes it easy for them to reach out and touch a screen or may not be able to touch and look at the same time. Using a switch is also more cognitively demanding in that the stimulus is not happening in the same place as the response.

Use of switches

Movement: many pupils with profound and multiple learning difficulties have physical disabilities. This often means that they have restricted movement and may only have control over certain parts of their bodies. Access to a switch can mean interaction with many other activities but the best switch position has to be established first.

Which movement is the easiest for the pupil and will allow them, once they are familiar with it, to use a switch easily without having to think about it every time?

Positioning: Many pupils with physical disabilities need adapted chairs, standing frames and other equipment. To access technology, they will need to be in their most comfortable and supported position where they can easily move to access their switch without straining. Support for the rest of their body is essential so that they do not have to concentrate on anything except what they are supposed to be learning.

Some of the preferred positions tend to be:

- Having the switch flat on a table or wheelchair tray at a comfortable height for the user to reach without straining. A Velcro board, Dycem, or suction plate can be used to stop it moving around. The switch can be positioned at an angle on a switch mount on a Velcro board on the tray or table.

- On a mounting arm attached to the side of the chair or to the tray within easy reach. This is particularly useful for people with athetoid cerebral palsy who may have very large movements.
- On a mount on the side of the user's head. Some people find moving their head much easier than moving their hands. Make sure that the switch is positioned on the side that they don't lean towards so that it is only activated by deliberate movement.

Pupils who have profound and multiple learning disabilities without physical disability may have other positioning problems to do with behaviour or very poor concentration.

Some pupils may need to have their position changed so often because of their health or discomfort that they will not be able to establish a comfortable working one. In that case, can you find access to stimuli that can be used in more than one position?

Prompting – a lot of pupils will need a verbal or physical prompt to start with. Whilst this is useful and important, it is also essential that the number of prompts and their intensity are gradually diminished. Keep the language for a verbal prompt simple and consistent. It is better to say 'Go!' than 'Go on, press the switch, that's a good boy, get the little men on the screen to dance around'... ad infinitum.

Consistency – it is important that using the switch becomes second nature. The pupil should not have to be spending more time looking for the switch than attending to what happens after he / she presses it. Once you have found a good switch position then stick to it – ideally, set the pupil up with his / her own equipment which can be attached easily and in the right position to whatever you are working on at the time.

Don't try to do other things at the same time. If you are working on learning to press a switch to make something happen, you don't need to be wearing your wrist splints (unless they make movement easier) or have the switch at the furthest extent of your reach because your physiotherapy programme says that you should be extending it. Do those things at some other time.

Which position will allow the pupil to access a switch easily and comfortably whilst concentrating on the response?

Vision: Can he/she see? If so how much? Do they need time to focus on things? Can they track? Does their visual attention vary from day to day / minute to minute? Do they have a restricted field of vision? Do they show visual preferences? If they apparently respond to visual stimuli, are you sure it is the visual element that is the interesting one? What advice have you had from the VI teacher / optician / optometrist? Did they have their eyes tested medically? Do you know or can you infer anything about their perception? If they appear to have fluctuating visual attention (eg can track one day but not another) or have very limited vision, should you be concentrating on hearing or another sense as the primary one for getting information? Which situation will give the pupil the maximum chance to use their vision?

Tobii Eye Gaze Technology have developed software to allow you to record what the pupil is looking at on the screen and how they respond to verbal commands to look at certain items. See <http://www.sensoryguru.com/product/tobii-gaze-viewer> for details.

Inclusive Technology have developed a system for assessing pupils' use of their eyes and developing their vision and cognition. See <http://www.inclusive.co.uk/insight>.

Which position / setting will allow the pupil to make the best use of their vision? If their vision is very limited should I rely on their other senses?

Hearing: Can he/she hear? Do they show preferences for particular sounds? Is it definitely the sound that is causing the response? Do they show signs of tracking interesting sounds? Do they display 'listening' behaviour (stilling, moving the head towards the sound, weaving)? Is the general noise level in the classroom too high to allow concentration and active listening? If so, should we be working somewhere else? What medical advice / advice from the hearing impaired teacher is available stating how much the pupil can hear? If they have glue ear, their hearing may fluctuate depending on the weather and their state of health.

Which position / setting will allow the pupil to concentrate on a sound response?

Health: Some pupils with PMLD have health issues that affect their learning. Epilepsy, asthma or other breathing difficulties, tube feeding, pain etc can all affect their readiness to learn. Do they sleep a lot during the day? Is there a time of the day or the week when they tend to be more responsive? Of course you will want to do everything at that time so prioritisation is important as well!

When would be a good time for this pupil to do individual work when they are most likely to succeed?

Personal Care / Therapy: All individual learning has to be balanced against the importance of appropriate meeting of personal care needs and various therapies. Again, prioritisation and good timetabling is essential. It is also important to remember that some therapy periods are very tiring – hydrotherapy particularly – and that some personal care needs – eating – may also cause the pupil to be less responsive afterwards.

Is my timetable set so that the pupil has regular times for individual work when he/she will be responsive?

Switch use

I have identified motivating activities, a switch position to try, a place to work in and an appropriate time on the timetable. What next?

Cause and effect: Pupil presses the switch (or the touch screen) and responds to what happens. Once the reward sound / picture has stopped, do they press it again to make it happen again? Do they turn towards the response, are they concentrating on the switch itself or are they waiting for you to say 'well done'? If they seem to be fascinated by the 'click' the switch makes when it is pressed, it might be a good idea to try a switch such as the Pal Pad which is silent when pressed.

Once he/she is pressing the switch and paying attention to the response, you need to look at their timing skills. Do they wait for the response or keep banging on the switch with no apparent idea about the fact that the response continues? Is the response time very short? For some pupils, they need quite a long response time so that they can either work out where it is coming from or adjust their head and their vision so that they can look at the screen. Most programmes will let you adjust the response times for longer or shorter sessions.

Generalisation – once you've got them interested in controlling one activity with appropriate switch movements and timing, can they do something else? Like all educational activities, you can't say you've learnt it until you can generalise it across people, places and responses. Think of using other computer programmes, switch

operated toys, small electronic devices connected to a mains controller, items in the sensory room etc. Remember your list of motivating items but throw in something unusual or unknown every now and then, just to keep them on their toes. No one likes at 12 what they liked at 8.

Use across the curriculum – if pupils are working on cause and effect with switches then many activities can be timetabled in to ensure they practise in a variety of circumstances. For example: use your switch with a single message device to answer the register, make sound effects for the story, take a message to the office, start a race in PE etc. Use the switch with a mains controller and the liquidiser or food mixer in cookery. Liquidise your own lunch. Activate the fan, a small fountain or the microscope in science. Play a CD, MP3 or YouTube videos in music. Help the staff show the rest of the class or the whole school a presentation on the whiteboard. Use appropriate software to identify colours on screen in maths. Activate a camera or video camera to make a record of what you are doing. etc etc.

And finally

Independent use. Control your own leisure time by doing something you enjoy on your own. It is also important that pupils learn that the response they are looking for is what is on the screen, or changing in the environment, not a member of staff saying 'Good boy, well done'.

Where do we go next?

Moving on from cause and effect.

Many pupils in SLD schools seem to get 'stuck' on cause and effect activities. Whilst these activities can be very useful things to continue as part of the curriculum, once the pupils have generalised a simple switch movement to a wide variety of activities then they need to move on to something else. At this stage, we can go one of two ways. It may be that you think that working on both of these at once would be appropriate.

Using two switches: If the pupil is able to have enough control over his or her movement to access two switches then they can move on to choosing using them. To start with, each switch can be attached to something interesting and rewarding for the pupil. The pupil will then have to be shown that there are two switches and that they both do something different. Once they have established this skill independently then you can attach one of the switches to something boring or that they are not interested in. They should be allowed to have this response so that they learn that choosing one switch over the other can be rewarding. If they have some understanding of language and/or some symbolic understanding you can attach each switch to a single message device and move on to active choosing using symbols, pictures or objects of reference as appropriate. Again, make sure that you go through a stage where one of the responses is boring and ensure they are bored before you ask them to choose again.

Two switches can also be used with two pupils for turn taking. There are computer programmes which allow you to set up a game which means you have to press each switch consecutively to continue. Talking books can also be used with one switch used to turn the page and the other one to read what is on it.

Using one switch – beyond cause and effect: there are several activities that enable pupils to develop their skills beyond cause and effect.

'Build up' – this is the sort of computer programme that requires you press the switch several times to get a response. Very good for developing the concept of a delayed reward.

'Timing' – this is an important skill to learn before moving on to scanning. Can you press the switch when something happens, not to make it happen? Again, there is software

designed for this but you can also use the switch into the single message device and join in with a song, a story or the register, pressing your switch in response to a cue.

'Latching' – mains controllers and sensory rooms tend to come pre-programmed with this function. One press of the switch turns the activity on, another press turns it off. This is very useful for developing independent leisure – turn your music on to listen to it, turn it off when it's lunch time. People who tend to bang the switch regardless of the response might take a bit more notice of what they are doing if the thing they enjoy keeps going off! It is also useful for the solitary switch user in a more physically able class – be in charge of the music for Musical Statues or similar games.

'Timed response' – again this can be set up via a mains controller, software that contains the function or the sensory room. Pressing the switch activates the reward activity for a short time, whatever has been set by the member of staff, and then it stops. Pressing the switch again produces the same short burst of whatever it is.

Scanning: This is the action of choosing an item from an array in front of you by responding to a series of visual or sound cues using a switch or similar.

This is an intellectually challenging exercise and anyone who can do it independently probably no longer qualifies as PMLD according to the criteria at the top of this article.

ALM 2017