**Special educational
needs and/or disabilities
Training toolkit**

For PGCE trainees

Every Child Matters

ICT and SEN

Self-study task 5

tda

developing people, improving young lives

Introduction to the self-study tasks

These self-study tasks are designed to help trainee teachers on PGCE courses learn more about teaching pupils with special educational needs (SEN) and/or disabilities. They can be used as stand-alone activities or to supplement and extend taught sessions on SEN and disability provided by the school or local authority.

There are 17 self-study tasks in all. Each task will take about two hours to complete, excluding practical activities.

Every Child Matters	
SST1	Inclusion and Every Child Matters
SST2	SEN and disability legislation
SST3	English as an additional language and SEN
SST4	Children's needs and development
SST5	ICT and SEN
Cognition and learning	
SST6	Moderate learning difficulties
SST7	Dyslexia and specific learning difficulties
SST8	Working memory
Behavioural, emotional and social needs	
SST9	Behavioural, emotional and social difficulties
Communication and interaction	
SST10	Speech, language and communication needs
SST11	Autistic spectrum disorders
Physical and sensory impairment	
SST12	Visual impairment
SST13	Hearing impairment
SST14	Handwriting
SST15	Developmental coordination disorder/dyspraxia
Working in partnership	
SST16	Working with colleagues in school
SST17	Working with parents/carers and other professionals

How to use the materials

This is an online resource. Some of the tasks are for you to do on your own; others are particularly suitable to do working with a partner.

Where some of the tasks ask you to record information you need to print out the relevant material first. Other tasks may involve using the internet, which gives you access to rich sources of information about SEN and disability and online forums for additional advice.

Each task includes the following elements:

• the professional standards addressed

• learning outcomes

• an opportunity to explore the concepts, definitions and research findings most relevant to the topic

• ideas for implementing the national curriculum inclusion statement in relation to the topic, including target setting, practical strategies, the role of additional adults and pupil grouping

• practical activities – including action research, child study and class observation

• resources – including books and websites

• an opportunity to evaluate your progress against the outcomes and plan your next steps.

A useful resource to support your studies is **Implementing the Disability Discrimination Act in Schools and Early Years Settings (DfES, 2006)**. It is available free to all schools and there should be a copy in your training institution or school. (If you haven't got a copy, you can order one using the link.)

It should be read in conjunction with **Promoting Disability Equality in Schools (DfES, 2006)** – which you can view, download or order by following the link.

Evidence and sources of information

As you work through these self-study tasks, try to keep a critical and evaluative attitude. Much of the understanding we have of what works, or doesn't work, in relation to meeting the needs of pupils with SEN and/or disabilities has not been fully researched.

Remember:

• many interventions suggested for one group of pupils with SEN and/or disabilities will often benefit other groups of pupils, including those without SEN and/or disabilities

• the quickest way to find out what to do is often to ask the pupil or their parent/carer what they think works.

Literature reviews of 'what works' in relation to literacy and mathematics for pupils with SEN and/or disabilities, which has been investigated in some depth, are available at: **www.dcsf.gov.uk/research/data/uploadfiles/RR554.pdf**

Other sources of information are listed at the end, under 'References'. You can use these to follow up and learn in greater depth about the material covered in this self-study task.

Self-study task 5

ICT and SEN

Professional standards addressed

Q4 Communicate effectively with children, young people, colleagues, parents and carers.

Q5 Recognise and respect the contribution that colleagues, parents and carers can make to the development and well-being of children and young people, and to raising their levels of attainment.

Q8 Have a creative and constructively critical approach towards innovation, being prepared to adapt their practice where benefits and improvements are identified.

Q23 Design opportunities for learners to develop their literacy, numeracy and ICT skills.

Q24 Plan homework or other out-of-class work to sustain learners' progress and to extend and consolidate their learning.

Q25 Teach lessons and sequences of lessons across the age and ability range for which they are trained in which they:

(a) use a range of teaching strategies and resources, including e-learning, taking practical account of diversity and promoting equality and inclusion.

Q28 Support and guide learners to reflect on their learning, identify the progress they have made and identify their emerging learning needs.

Learning outcomes

You will understand:

- how barriers to participation and learning can be removed through ICT
- that ICT can enhance opportunities to include pupils with SEN and/or disabilities, and
- your role in supporting pupils with SEN and/or disabilities using ICT.

Activities

Activities		Timings
Activity 1	Checking the accessibility of the information and communication technology (ICT) you use in lessons	20 minutes
Activity 2	Laptop computers	20 minutes
Activity 3	Using ICT to include pupils with SEN and/or disabilities	20 minutes
Activity 4	A case study	20 minutes
Activity 5	Teacher use of ICT for inclusion	10 minutes
Activity 6	Two case studies	20 minutes
Activity 7	Points for action	15 minutes
References		
Appendix	Suggested answers and solutions	

Activity 1

Checking the accessibility of the information and communication technology (ICT) you use in lessons

Approximate timing: 20 minutes

ICT is both a subject in the National Curriculum and a key functional skill.

Inclusive teaching will enable pupils with SEN and/or disabilities to be confident and capable when using ICT systems and tools to meet a variety of needs in a range of contexts. These include:

- finding, selecting and bringing together relevant information
- developing, interpreting and exchanging information for a purpose
- applying ICT safely to enhance their participation and learning and the quality of their work.

For pupils with SEN and/or disabilities ICT can offer ways of removing barriers to participation and learning across the curriculum. But before teachers can use ICT resources to promote inclusion, they need to make sure that the ICT equipment itself is accessible to all learners in their classes, including those with SEN and disabilities. Some pupils with SEN and/or disabilities will need assistive technology tools to help them make the most of the possibilities offered by ICT.

Checking accessibility

Look at table 1, which shows some of the difficulties pupils might have in using ICT equipment.

Think of the classes you have taught or observed during your school placement. Consider which of the problems might apply to particular pupils and suggest possible solutions in the right-hand column. There is space at the end for you to add any other problems not covered in the table.

Table 1: Accessibility audit	
Problem	**Solution?**
The screen font is too difficult for the pupil to see comfortably	
The cursor or screen pointer is too difficult for the pupil to locate	
The glare on the screen from reflected light is uncomfortable	
The pupil complains of fatigue when working at the computer	
The pointer moves too quickly across the screen	

Table 1: Accessibility audit continued

Problem	Solution?
There isn't enough time to double-click the mouse button	
It is difficult for the pupil to hold down the mouse button and move it at the same time	
Moving the mouse around the table is causing difficulty	
The keyboard is too complicated, with lots of keys that the pupil doesn't need	
The keyboard has keys written in upper case and the pupil has difficulty recognising them	
Strings of unwanted characters appear because the pupil can't get their fingers off the keys fast enough	
Typing every letter is slow and laborious for the pupil	
The pupil uses text-to-speech software, but it distracts others	
The pupil can see the font on screen but has difficulty reading the printout	
Others...	

Read the following sections:

- Access features built into the operating systems, and
- Access features to support pupils with particular SEN and/or disabilities.

Then add further solutions to table 1 as you discover them. When you have finished, compare your table with the suggested solutions in **the appendix**.

Access features built into the operating systems

Access features built into today's operating systems and software applications mean that ICT can be made accessible to a wider range of users without having to add extra software or hardware. Accessibility options enable the behaviour of the computer to be modified to suit the user. For example, the font can be enlarged to make it easier for pupils to see, or the keys can be prevented from sending strings of letters to a word processor if they are pressed for too long. Addressing these problems will benefit all pupils, not just those with SEN and/or disabilities.

Useful access features to support pupils with SEN and/or disabilities include:

- **Keyboard settings** – such as 'sticky keys', 'filter keys', 'ignore repeated keystrokes' and 'slow down the repeat rate' – can support pupils who have difficulty holding down more than one key at the same time, who hit unwanted keys accidentally, or who have difficulty releasing their fingers from keys.

- **Sound settings** – can help support pupils who have restricted vision or who are unable to access on-screen text warnings by providing visual indications when warnings or sounds are played.

- **Display settings** – can help visually impaired learners make the most of their vision by adjusting display settings and changing the font or background colour to suit their needs. This can also be helpful for dyslexic or beginner readers. Systems have options for setting the size of fonts, menu bars and window background, the size and spacing of icons, and other properties of the desktop and windowing environment. These can be stored under a computer user's profile so that they are automatically set when they log on to the system.

- **Mouse settings** – where the speed of movement, size, click speed and visibility of the mouse pointer movement can all be adjusted. For those who cannot use a mouse or an alternative controller, such as a trackerball or joystick, system accessibility options may allow them to use the numeric keypad to steer the mouse pointer around the screen.

Accessibility features can be assigned short-cut keys to allow them to be switched on and off quickly. This can help a teacher or teaching assistant to support a pupil, for example, without having to be encumbered with a slow response from the keyboard.

Other features, like serial keys, can be added to the system to allow external devices, such as communication aids, to act as keyboards or mice (these are known as keyboard or mouse emulators).

Access features to support pupils with particular SEN and/or disabilities

A number of accessibility features can be used to support pupils with particular SEN and/or disabilities.

Visual impairments

The range and types of visual impairment are wide, from partial sight to blindness, so accessing information through a computer screen can be difficult or even impossible. Although it may be possible for some visually impaired pupils to use low-vision aids for reading text, it is often the retrieval of information that is the greatest barrier to a learner's independence.

Increasingly, information is delivered in a digital format on the internet, so support to be able to read it, or an alternative to sight, is essential. A range of technology can help with text display, input and output, including:

- screen magnifiers – screen magnification software enlarges text and other objects so they can be seen more easily – 16 times magnification and greater is common

- screen readers – many users with no usable vision can access screen information with screen-reading software, which reads out text and describes images.

Physical disabilities

Many people with physical disabilities are unable to use pointing devices such as mice or trackerballs. Physical disabilities embrace a wide range of needs:

- Some pupils may have uncontrolled hand movements that prevent the precise manipulation needed to guide a mouse pointer across the screen. These pupils depend on standard or alternative keyboards for access.

- Others with minimal movements – for example, pupils with muscular dystrophy or motor neurone disease – often cannot access keyboards easily and rely on alternatives such as on-screen keyboards or voice commands to control the computer.

- Using a mouse and dragging and dropping objects on screen is particularly difficult for many users with fine motor difficulties. (See above for adjustments that can be made to mouse characteristics.) There are also alternative and specialised hardware alternatives to the mouse, such as trackerballs, joysticks, mouse and keyboard emulators, headpointers and eye-gaze systems. These need to be carefully selected to suit individual users.

- Where users are unable to operate a computer reliably through any input device, speech recognition can provide access. This enables users to dictate text, choose menu items, and control operations entirely through speech. Speech-recognition systems are becoming more user-friendly, but still require 'training' – as does the user. They are not suitable for all pupils.

Hearing impairments

Where learners have only minor hearing impairments, adjusting the standard system volume control can help them to access sound and music files, CDs and DVDs. Use of headphones can also support learners, but only in circumstances where doing so does not isolate them from the rest of the class.

Those with more severe hearing impairments might be helped by:

- Visual indicators of sounds – increasingly, multimedia uses sound (speech or music) to provide an additional channel for information, or to motivate learners. Well-designed software provides text alternatives, so learners can access the same or similar information, but much software does not. In these cases software such as Microsoft Sound Entry provides a visual indication that a sound is playing, and can give more information if it is available.

- Signing avatars – some software includes small on-screen video clips of signers interpreting the speech and sound, to support users who cannot hear. Virtual avatars can provide a similar function. However, because British Sign Language does not use the same grammar construction as spoken or written English, it is not possible to produce a simple equivalent of text-to-speech (see below).

Language and cognition needs

There is a significant group of learners with communication, language or learning difficulties that require simplification, or other forms of differentiation, in their use of learning resources. For example, some might find the language structure, its form or representation, and the vocabulary level of text too complex. Such users may also struggle with elaborate menus, options and dialogue boxes.

A number of approaches can support learners in accessing, recording and vocalising information, including:

- Symbol systems – a number of different symbol vocabularies have been designed to help those who find text difficult or impossible. These can be used to help learners access information, as well as for writing activities. Common symbols include Widgit (originally Rebus), Makaton and Mayer-Johnson. Software is also available to enable symbol users to use e-mail and the web.

- Supported word processing – many learners find the effort or cognitive abilities required to create a word from scratch, either by hand or typing, is beyond them. On-screen word grids, in which users simply select their chosen words, can enable them to create written work. Word-prediction software can decrease the amount of effort required to produce text or, if the learner has a very slow letter rate, speed up their typing. Talking word processors can also offer support for many hesitant writers, including those with dyslexia.

- Text-to-speech systems – using standard text-to-speech utilities can help many users with reading difficulties gain more from educational resources. If text-to-speech is not available in the software itself, it may be possible to export text by copying and pasting it into a utility that will speak it.

- Communication aids, which come in many forms and vary in the complexity they offer for communication.

You can find out more about access options at **http://schools.becta.org.uk/upload-dir/ downloads/improving_access_with_assist_technology.doc**

Activity 2

Laptop computers

Approximate timing: 20 minutes

This section looks at one piece of equipment that can support the learning of pupils with SEN and/or disabilities – the laptop computer.

Start by making a list of the ways in which a laptop computer can support pupils' learning. When you have finished, compare your list with that in the left-hand column of table 2 on the next page. Add any additional features in the empty cells at the end of the table.

Who needs a laptop?

Table 2 lists some of the ways in which a laptop can support all pupils' learning.

Laptop computers can be particularly helpful for pupils with SEN and/or disabilities.

In the middle column note the barrier to learning and/or participation that each particular feature might help to remove. For example, the requirement to produce neat, legible, handwritten work, which can be a barrier for some, can be overcome using a laptop because it allows pupils to produce neat, legible copy.

In the right-hand column, note the types of **learning need** (not particular conditions) where the feature might be beneficial – eg the requirement to produce neat, legible, handwritten work can be a barrier for some pupils with physical or motor difficulties. You could use the areas of need from the SEN Code of Practice, ie:

- communication and interaction
- cognition and learning
- behavioural, emotional and social
- sensory and/or physical.

Table 2: Laptops		
What a laptop offers	**Barrier**	**Who is likely to benefit**
Easier method of recording		
Recording other than with handwriting		
Improved speed of working		
Improved presentation of learning tasks (so pupils can see things more easily)		
Improved presentation of work		
Access to screen readers/ voice-output software		
Access to diverse resources		
Activities presented in more accessible formats		
Personalised tasks		
Status of using new technology		
Access to peripherals (eg closed-circuit television (CCTV), touch screen)		
Continuity between home and school		
Communication with others		

Whose responsibility?

Pupils requiring complex technological support will usually have a statement of SEN and provision is made through the local authority following an expert assessment. Sometimes – for example, when voice output communication aids (VOCAs) are required – decisions require the involvement of health personnel such as speech and language therapists, physiotherapists or occupational therapists, as well as children's services staff.

Laptops are increasingly being provided by schools. It is the teacher's job to make sure the use of the technology is appropriately integrated into lessons. However, this can be a complex task and will require support from a range of others, particularly teaching assistants and technicians. It can be helpful to draw up a plan showing when the laptop will be used and who will take responsibility for what. Often pupils can do a number of these jobs themselves, eg keeping the laptop charged up.

Managing a laptop in a classroom

Managing a laptop in a classroom can require input from different people with a range of roles and responsibilities. These may vary considerably between schools and even between pupils within schools. Some will take on a large degree of responsibility for it themselves, while others will need a great deal of support.

Imagine that a pupil in a class you teach has a laptop to help remove barriers to participation and learning.

Complete table 3, by filling in who you think should be responsible for what part of the support. Some tasks may have more than one person's name. Those involved may include: special educational needs coordinator (SENCO), teaching assistant, pupil, parent/carer, class or subject teacher, technician, school keeper, headteacher, form tutor, peers, health professionals, local authority – or someone else.

When you have finished, compare your table with the suggested responses in **the appendix**. There is not a 'right answer' in relation to who does what, but there is a need to coordinate all the tasks, and you should know who does this work in your school.

Table 3: Whose responsibility?	
Task	**Responsibility**
Keep battery charged	
Print out work	
Provide electronic versions of worksheets	
Upload worksheets	
Submit work electronically	
Ensure laptop is kept securely	
Seating the pupil where there is room for the laptop, plus books and peripherals, suitable lighting – and sometimes a network point and socket	
Loading software and keeping it up to date	
Virus checking	
Internet safety	
Setting it up in class	
Getting it to the lesson on time	
Insuring it	
Providing the laptop	
Making sure everyone does what they should	
Deciding what lessons to use it in	

Click here for suggested solutions

Activity 3

Using ICT to include pupils with SEN and/or disabilities

Approximate timing: 20 minutes

20 mins

Audit of ICT use

Use table 4 to list the ways in which ICT can be used to include pupils with SEN and/or disabilities in lessons across the curriculum. Draw on your reading, your own experiences and your observations from your school placements.

Table 4: Using ICT to include pupils with SEN and/or disabilities
Ways in which ICT can be used to include pupils with SEN and/or disabilities in lessons

In its publication, Overview of Special Educational Needs and ICT Provision, Becta, the government ICT agency, identified four ways in which ICT can benefit pupils with SEN and/or disabilities:

- **ICT can be a motivating medium:** Many learners are attracted to computers and want to learn through them. Software applications incorporating colour, pictures, animations, sound and humour can build on that interest, creating attractive learning opportunities to engage pupils.

- **ICT presents information in different ways:** Pupils learn through different channels so information presented in multimedia form gives them more opportunities to engage. They can gain access to information through text, graphics or sound to suit the pupils' individual learning styles and strengths.

- **ICT offers an opportunity for social interaction:** Pupils can work together around the computer, focusing on the learning task. Through this medium they can develop their language and social skills as well as learn from one another, as we saw in activity 1.

- **ICT provides a range of assistive technology tools,** hardware and software, to enable many learners with access difficulties to overcome barriers to learning.

Compare your list to the Becta categories and consider if the uses you have identified fit under these headings.

You might have identified other benefits, such as using ICT for risk-free experiment. For example, some software, eg Immersive Education's Kar2ouche: Social Communication, allows pupils on the autistic spectrum to try out strategies for social situations that they find difficult in a safe virtual environment first.

Abbott (2007) has suggested a different way of thinking about how ICT supports pupils with SEN and/or a disability. He identifies:

- technology to train or rehearse – 'drill and practice' software

- technology to assist learning

- technology to enable learning.

You have already considered how technology can assist learning in activity 1. The rest of this section looks at Abbot's other two categories.

Technology to train or rehearse

Much use of technology in the 1980s and early 1990s fits into this category, as does much current use. Although such technology has its place, it should be in the background and only used when needed. Too often this technology has taken centre stage.

Take another look at the list you made at the beginning of activity 2. Can you identify examples of this sort of technology?

They may include:

- software to learn spellings – such as Wordshark or Starspell

- mathematics reinforcement – such as RM Maths, SuccessMaker or Accelerated Math

- online multiple-choice exercises with unlimited attempts permitted to answer.

Jot down why you think such programs might be useful for pupils with SEN and/or disabilities and then compare your list with the list on the next page.

Benefits of 'drill and practice' programs:

- opportunities for reinforcement, practice and 'over-learning'
- automatic marking
- objective assessment
- summative assessment
- more acceptable, accessible and presentable than pages of calculations
- pupils can work at their own pace
- pupils can automatically move on to higher levels
- offers reporting systems
- consistency of presentation.

Now jot down possible disadvantages of using 'drill and practice' software.

You may feel, for example, that just as pupils may be able to chant all the times tables, without understanding how any answer is related to the one previous to it, or following on from it, 'drill and practice' programs can be seen as dull and mechanistic while not leading to any depth of learning.

The attraction of these approaches to software developers is that they are comparatively easy to design as they are built on databases of varying complexity. Because of this design they can produce different types of report, and participants can be monitored and moved on automatically, given particular triggers within the system.

For teachers and pupils they offer exercises that are containable, that meet specific objectives, and that provide ready feedback.

Using technology to enable learning

Abbot's third category – using technology to enable learning – is far less common than is often claimed. Here technology is used to make learning possible where it was not possible before.

Look again at the list you compiled at the beginning of activity 3. Can you identify uses of ICT that offer learning opportunities not available through other means?

Examples might include:

- Developing Tray, which helps pupils develop reading strategies
- a flight simulator
- a 'fly through' of an ancient monument
- changing the parameters of a virtual model to ask 'what if?' questions.

Activity 4

A case study

Read the following case study, which explores a range of results from the introduction of a new technology – personal digital assistants (PDAs).

The project described in the case study explored how such technology can improve standards and raise attainment, particularly in English and mathematics.

An article about the advantages of hand-held devices can be found at:
www.guardian.co.uk/education/2007/jan/09/elearning.technology1

Case study: PDAs in Feltham, West London

All 60 year 6 pupils in an urban primary school, Victoria Primary, in Feltham, West London, were given PDAs for a year. The pupils were responsible for the PDAs for 24 hours a day, could 'personalise' them with games and music and enjoyed taking them home and sharing their learning with their parents. The teachers enjoyed working with the PDAs and experimented with many new approaches to learning. They were both comfortable with the technology; one had specialist ICT expertise.

The programme was initiated in partnership with the leaders of the local City Learning Centre (CLC). Professional and technical support was available quickly and formally from the centre.

Here are some of the findings:

English
Pupils with concerns about their handwriting found "it [the PDA] makes your writing neat" and appreciated the reduction of anxiety. Teachers explained that pupils with poor handwriting, because of fine motor control impairments, could not, at first, get the PDA to accept what they wrote with a stylus. Soon, however, they learnt to form the letters properly so that the PDA recognised them. They then printed out an elegant fair copy.

The teachers encouraged drafting and redrafting of writing through the PDAs – for example, to teach the development of essay structure and chapter headings. Pupils could also use games and activities to practise spellings.

Pupils downloaded e-books onto the PDAs. Staff were cautious about the appeal of 'the library' on offer which was weighted towards Victorian and Edwardian classics for young people. The pupils made it clear that this was not an issue. A teacher said, "It's opened up a whole new world for the children… they're all reading e-books for half an hour during the morning…".

Mathematics
The PDAs supported striking learning gains, for example in relation to mental mathematics. The teachers attributed this to many factors, but specifically to the ability to "practise efficiently". For example, a year 5 group without PDAs in the academic year 2004/05 found practising times tables difficult and uninspiring. In contrast, the year 6 group in 2005/06 found learning tables with the PDAs clear and motivating. So they kept trying and learnt them. Teachers reported that children who used the PDAs most made the biggest gains.

The story of 'S'

One teacher told this story: "'S' was on the special needs register... he found most areas of the curriculum very difficult... I think the PDA gave him the confidence to feel that he could succeed, especially in maths. In our first mental mathematics test of the year, which was marked out of 20, 'S' scored zero. He practised on his PDA practically every night. We were able to 'beam out' to him personalised games, things that he particularly needed to practise... and he went on to get a level 4 at the end of the year."

Personalised learning

Staff liked to select specific aspects of learning for pupils to explore. Rather than formal homework, the pupil could go home with games or other activities on their PDA and practise until they were clear about the process to be learnt.

Metacognition: Learning to learn

All pupils enjoyed the 'over-learning', the continuity of practice in and out of school. This was also evident at revision times – for example, when the pupils were preparing for the national curriculum tests.

The project also demonstrated the possibilities of wireless technology for peer-supported learning in the classroom: ideas for learning were swiftly beamed between individuals for immediate use.

The PDAs were seen as cool and personalisable: they were 'owned'. Children who might otherwise have rejected many forms of teaching appreciated the status and fun of the PDAs and were drawn into formal and informal learning.

The important and year-wide gains in general ICT confidence and expertise were so 'embedded' that they could easily have gone unremarked. Pupils were clearly comfortable with the technology and its many possibilities.

The PDAs were valuable for pupils with SEN. For example, those concerned about their recording and handwriting could make, draft and share versions of work for their class assignments.

The project was built on the commitment of the whole school community. The headteacher and the ICT coordinator gave it their full backing. Parents showed support by high attendance levels at information evenings and their day-to-day commitment to helping pupils maintain the PDAs charged and ready for use. The PDAs proved reasonably robust, so taking care of them was relatively straightforward. In an unplanned benefit, the project generally enhanced home-school communication with year 6 parents and carers. The PDAs provided a 'bridge' around which conversations on many aspects of pupils' progress and participation in school, including sensitive issues, could be structured.

Conclusion

The evaluation concluded: "Given the consistency of the quantitative end-of-year results with the qualitative data gathered, it is hard not to accept the view of all respondents that, while other factors were obviously involved, the PDAs had a major role in transforming learning and teaching, and thus achievement, in year 6 classes during the academic year 2005/06."

To identify the best approaches to introducing new technology, Becta carried out two research summaries (Becta, 2003) of evidence on factors that enable or hinder the use of ICT in education. The evidence suggested that all five factors need to be in place to make a technological innovation in education 'stick'. The factors remain relevant whether the technology is being introduced for all pupils or for pupils with SEN and/or disabilities.

Look at table 5, which relates these factors to the Feltham PDA project, and try to answer the questions about the case study in table 6 on the next page to check your understanding of the content of this activity.

Table 5: Factors for enabling ICT use	
Becta enabling factor	**Feltham PDA project 2005/06**
Leadership and planning	Leadership and planning available from school and CLC leaders
Personal confidence in ICT; time and access to ICT resources	Both teachers were comfortable with ICT – one had particular technical interests, eg in downloading material from the internet
Collaboration with schools and the community	Strong collaboration between the school and its community of parents
Professional (informal and formal) development	Professional development available through the CLC support team
Lack of technical faults and the quick remedying of any that do occur	The equipment was robust – staff could readily give time to putting matters right, if necessary
Willingness to change among teachers	Teachers committed to innovation

Table 6: Checking your understanding

Questions	Your answers
The extract refers to several examples of 'technology to train and rehearse'. Can you identify them?	
Can you identify an example of 'technology to assist learning' in the extract?	
Can you identify examples of times where the PDAs encouraged learning in a way that would not have been possible without them?	
Why were parents more comfortable about discussing sensitive issues with teachers during the programme?	
The Becta surveys of the literature suggested that all five factors identified had to be in place for an in ICT innovation to be successful. However, if you were introducing an ICT innovation, such as the PDAs, in a learning environment, you would have to choose priorities for action. Which of the five factors might you prioritise?	

Now compare your answers with those in **the appendix**.

Activity 5

Teacher use of ICT for inclusion

Approximate timing: 10 minutes

So far, this self-study task has focused on the way that pupils' use of ICT can help remove barriers to participation and learning. However, teachers and teaching assistants are increasingly using ICT as a routine part of their preparation to modify/adjust their teaching to include pupils with SEN and/or disabilities. ICT can also be a valuable tool for teachers and others in managing the provision that is made for pupils with SEN and/or disabilities.

Jot down the ways in which you and/or colleagues you have observed during school placement use ICT to support pupils with SEN and/or disabilities. When you have finished, compare your notes with those in the left-hand column of table 7.

Table 7: What can ICT offer teachers of pupils with SEN/disabilities?		
What ICT can offer teachers	**Why is it important?**	**What help is there?**
A tool for differentiation/ personalisation	Many software applications offer different levels of difficulty to suit different needs. Tasks created by teachers can be saved, and then adapted to provide the level of support required by an individual pupil.	Materials and software from the web can be downloaded and personalised. The TEEM site (**www.teem.org.uk**) offers teacher evaluations of a range of resources.
A means of creating relevant teaching materials of a high standard	Images taken with a digital camera, recorded voices and appropriate text, can all be incorporated into software packages to create resources that learners can relate to through their personal experiences.	The Teacher Resource Exchange (**www.tre.ngfl.gov.uk**) offers teachers the opportunity to share electronic materials they have created.
Access to freely available information, materials and support	The internet is a source, not only of free materials to enhance the curriculum, but also of information about a wide range of SEN and disabilities and professional support on aspects of inclusion.	The Inclusion site (**www. inclusion.ngfl.gov.uk**) is a catalogue of resources you can use to meet individual needs. It also lists e-mail forums that focus on SEN and inclusion, such as those managed by Becta.
Efficient access to records	Individual records of pupil progress, interventions and contacts with outside agencies should be available to all staff from school systems.	

Activity 6

Two case studies

⏰ **Approximate timing: 20 minutes**

Read the case study appropriate to the phase you teach and complete the associated activity.

1 Secondary: Lynne

Physical disability – statement of SEN – year 10

Lynne, now 15 years old, is in her local comprehensive school. She has mild cerebral palsy. She is usually independently mobile. Her speech and language have been affected by her condition, and she needs time to organise and sequence her thoughts, though her attainments are within the average range for her age. Her writing is well formed, neat and legible, but slow. She follows the full curriculum and is studying eight GCSE subjects.

Lynne has a statement of special educational needs. The school asked for an assessment of her; as a result, she was supplied with a laptop and trained to use it. She also had some touch-typing lessons. While she found the computer helpful, carrying the laptop around the large campus has caused problems. Until now, Lynne has not needed individual help and she does not like an adult carrying the equipment for her. She is refusing to use the computer at school.

A follow-up assessment noted that Lynne's typing speed was still poor. However, her speed of handwriting has increased. The report acknowledged that Lynne's independence was very important to her.

Note down in table 8 what resources, activities, support, monitoring and review might be appropriate for Lynne. When you have finished, compare your answers with what the school actually did, as described in the text following table 8.

Table 8: What did the school do?
Who did the SENCO consult in reviewing support for Lynne?
What new equipment did the school bring in for Lynne?
How did Lynne and the school resolve the issue of carrying the computer round the school?

After a discussion between Lynne, her parents, her class tutor and the SENCO, it was agreed that Lynne would use the laptop at home for coursework and longer pieces of writing, but would take notes by hand in class. She would take the computer to school on the days when she had private study time, when she would have support in writing essay plans and expanding them on the word processor. No new equipment was brought in.

Do you think this solution is appropriate? Could a better solution have been found?

2 Primary: Rahul

Speech, language and communication needs – School Action Plus – year 3

Rahul is eight years old, and is taught in a class of 29 year 3 pupils. His class shares a teaching assistant with another year 3 class. Rahul's communication skills are poor. He has had several chronic ear infections during his early years and his teacher has noted his poor auditory discrimination. Rahul limits his verbal communication to one-word replies or short utterances, needing help to order his thoughts and put together longer statements. The school is in need of refurbishment and the acoustics in Rahul's classroom are not good.

Rahul can write the alphabet, but is reluctant to do any writing other than to copy short sentences. He enjoys reading when it is a shared experience, but rarely continues when adult support is withdrawn. In general, Rahul is a quiet child who does not initiate conversation, and who is happy to sit uninvolved on the edge of a group. He finds it difficult to understand the purpose of most learning activity and is not, therefore, absorbed or interested. He does, however, enjoy using the computer, and his concentration and motivation are considerably extended when using it.

Note down in table 9 what resources, activities, support, monitoring and review might be appropriate for Rahul. When you have finished, compare your answers with what the school actually did, as described in the text following table 9.

Table 9: What did the school do?

Who did the SENCO consult in reviewing support for Rahul?
What did the school do about the acoustics of the classroom?
What new equipment did the school bring in for Rahul?
How did the school resolve the issue of involving Rahul more in group work?

After a discussion between Rahul, his parents, his class tutor and the SENCO, it was agreed the school would support Rahul in his regular use of speech output of electronic text to reinforce his understanding. He will be encouraged to write short stories, which can be 'read' back. He will use a web browser that allows simplification of web pages to support science and other investigatory work.

The use of an overlay keyboard will help Rahul to use visual clues to structure his language, and the clear, neat printout of his work can be displayed. It is hoped that this will improve his sense of achievement. Materials for his use, including those supporting his work in groups, such as prompt cards on asking for help, will be produced in text and symbol.

The ability of computer displays to support exploration of text and pictures by small groups will be exploited to build Rahul's confidence in small group discussion.

The school brought in a sound field system to enhance the clarity of communication in the classroom. Rahul and the whole class benefited; he found it much easier to understand what was going on, and the teacher found she did not have to raise her voice to be sure the class could hear her. Behaviour in the class also improved, perhaps because everyone could understand what was being asked of them.

Do you think this solution is appropriate? Could a better solution have been found?

Activity 7

Points for action

Approximate timing: 15 minutes

Spend a few minutes reflecting on this self-study task and record key points for action below.

What do I want to do next to develop my practice?

_____

_____

_____

_____

How will I do this?

_____

_____

_____

_____

What is my timescale for this to happen?

_____

_____

_____

_____

How will I know if I have been successful?

_____

_____

_____

Do I need to involve anyone else in enabling this to happen?

_____

_____

_____

References

Abbott, C, 2007, E-inclusion: Learning difficulties and digital technologies, Futurelab

Becta, 2007, An Overview of Special Educational Needs and ICT Provision

Peacey, N, 2006, Handhelds in Feltham: An evaluation – available online at:
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Appendix

Suggested answers and solutions

Table 1: Accessibility audit – suggested solutions	
Problem	**Solution?**
The screen font is too difficult for the pupil to see comfortably	Change the font size Change the font style to one that the pupil finds easier to read Set a better contrast between the text and the background by changing their colours or selecting the computer's 'high contrast' settings Use a word processor with a text-to-speech facility so that the pupil can get auditory support
The cursor or screen pointer is too difficult for the pupil to locate	Change to a larger pointer Add a trail to the screen pointer
The glare on the screen from reflected light is uncomfortable	Reposition the monitor or the pupil Alter the lighting conditions
The pupil complains of fatigue when working at the computer	Check the heights of the chair, table, monitor, keyboard and mouse to make sure they are appropriate for the size of the pupil, rearranging or repositioning if necessary Tilt the monitor to a better angle if it is adjustable Place a wrist support in front of the keyboard
The pointer moves too quickly across the screen	Change the mouse speed (the rate at which the pointer moves in relation to the mouse movement)
There isn't enough time to double-click the mouse button	Increase the setting for the time allowed Use a programmable mouse or rollerball to transfer the double-click action to a single click
It is difficult for the pupil to hold down the mouse button and move it at the same time	Turn on the click-lock access facility Use a mouse or trackerball that has a locking facility
Moving the mouse around the table is causing difficulty	Use a trackerball rather than a mouse to navigate Use a different mouse mat to slow down or speed up mouse movement

Table 1: Accessibility audit – suggested solutions continued	
Problem	**Solution?**
The keyboard is too complicated, with lots of keys that the pupil doesn't need	Put a mask over the keyboard so that only the required letters are visible Use a simplified keyboard or an overlay keyboard with a simple 'qwerty' keyboard overlay on it
The keyboard has keys written in upper case and the pupil has difficulty recognising them	Stick lowercase letters over the letter keys to make them stand out Use an overlay keyboard[1] and make a lowercase 'qwerty' keyboard overlay for it
Strings of unwanted characters appear because the pupil can't get their fingers off the keys fast enough	Switch off or slow down the keyboard's auto-repeat setting
Typing every letter is slow and laborious for the pupil	Teach keyboard awareness with a typing tutor program Provide ready-made word banks of the key vocabulary the pupil will need for an activity, either on screen or on an overlay keyboard Use a word predictor that runs alongside the word processor Use paired writing with an adult or peer to share the task of scribing
The pupil uses text-to-speech software, but it distracts others	Use headphones
The pupil can see the font on screen but has difficulty reading the printout	Change to a larger font before printing out Use an enlarging photocopier

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1   Overlay keyboards are plugged into computers and used in place of ordinary keyboards. They can help to improve access and control and are particularly useful for early learners or people with special educational needs. Once a user has become familiar with the overlay keyboard, a conventional keyboard can replace it.

Table 3: Whose responsibility? – some suggested answers

Roles and responsibilities will vary depending on the age of pupils and the extent of their SEN and/or disabilities.

Table 3: Whose responsibility? – some suggested answers	
Task	**Responsibility**
Keep battery charged	The pupil
Print out work	The pupil
Provide electronic versions of worksheets	The teacher
Upload worksheets	The teacher
Submit work electronically	The pupil, through a school-provided facility such as a learning platform
Ensure laptop is kept securely	The pupil – school should provide safe storage for their use
Seating the pupil where there is room for the laptop, plus books and peripherals, suitable lighting – and sometimes a network point and socket	The teacher, perhaps with initial support from the premises manager and ongoing support from a teaching assistant
Loading software and keeping it up to date	The school's technical support system
Virus checking	The school's technical support system
Internet safety	The teacher working within the school's ICT policy in collaboration with parents/carers
Setting it up in class	The pupil, perhaps with teaching assistant or teacher support
Getting it to the lesson on time	The pupil
Insuring it	The school
Providing the laptop	The school or local authority, perhaps through a statement of SEN
Making sure everyone does what they should	Depending on the situation, the SENCO, the school's ICT coordinator and parents/carers
Deciding what lessons to use it in	Depending on the situation, the SENCO, the school's ICT coordinator, the pupil and parents/carers

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Questions	Your answers
The extract refers to several examples of 'technology to train and rehearse'. Can you identify them?	Practising handwriting, mental mathematics and spellings Note: The project's discovery that the styluses used on the PDAs' screens were effective 'training' devices for those with concerns about their handwriting led to their use right through the school in the teaching of handwriting
Can you identify an example of 'technology to assist learning' in the extract?	You might have chosen the example of the pupils 'concerned about their handwriting' using the PDAs to write up and present their work
Can you identify examples of times where the PDAs encouraged learning in a way that would not have been possible without them?	• The games that could be sent home to personalise learning tasks • The 'beaming' of ideas round the classroom encouraging peer partnerships
Why were parents more comfortable about discussing sensitive issues with teachers during the programme?	Parents tended to come to the school to discuss the PDAs and were then encouraged to move on to talk about more sensitive issues
The Becta surveys of the literature suggested that all five factors identified had to be in place for an in ICT innovation to be successful. However, if you were introducing an ICT innovation, such as the PDAs, in a learning environment, you would have to choose priorities for action. Which of the five factors might you prioritise?	With most innovation in schools, management support is the single most important factor to be established early on. You may of course have found convincing reasons for choosing another one!

Note the way that the PDAs were of special benefit to some pupils with SEN and/or disabilities, as well as benefiting everyone in the class academically and socially.

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