ESCalate Developing Pedagogy and Practice 2009 Grant Project Final Report

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Project Leader	Dr Nigel Beacham
Institution	University of Aberdeen
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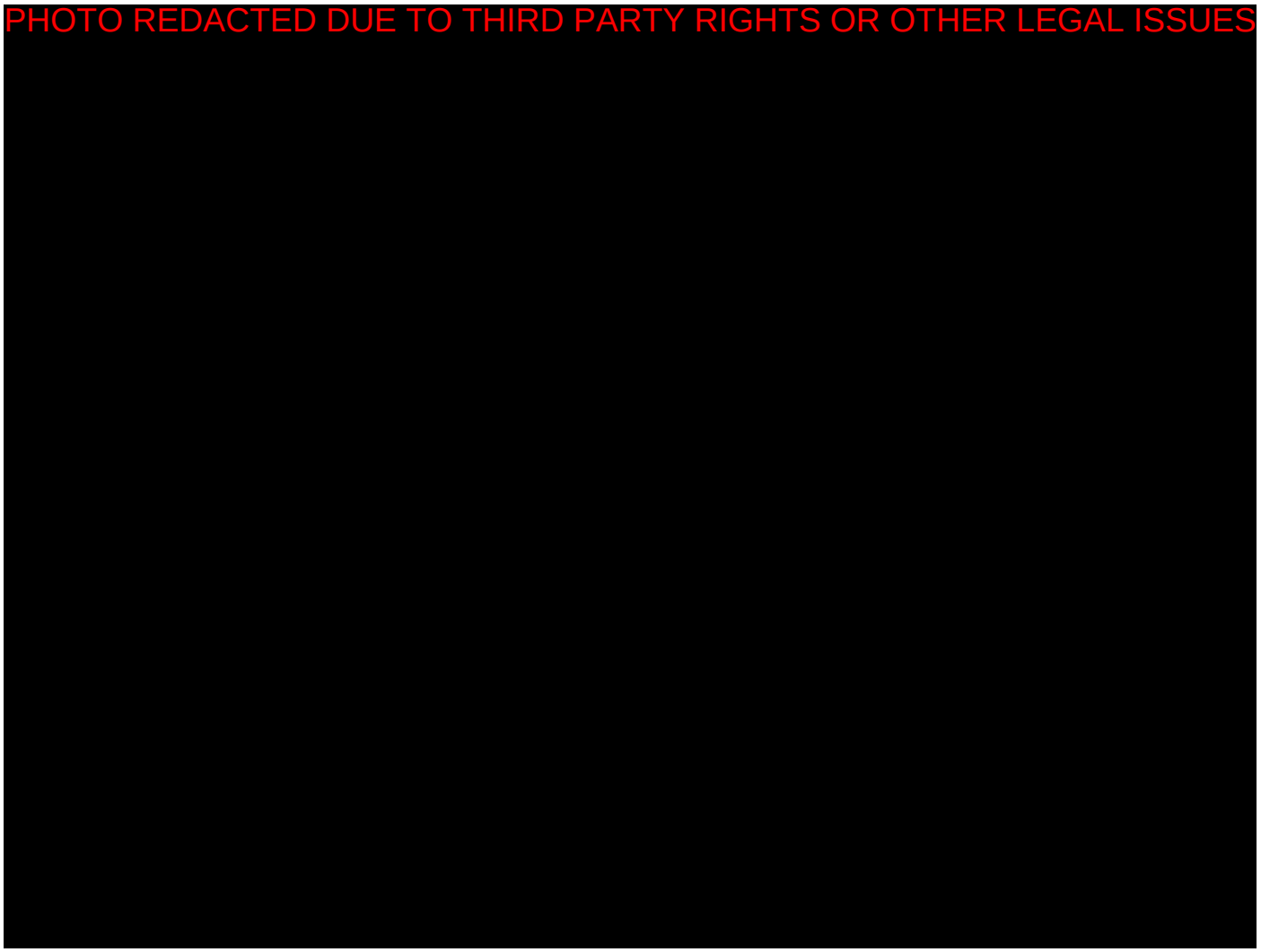

Dr Nigel Beacham

School of Education

University of Aberdeen

Aberdeen, Scotland, UK

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Executive Summary

This report presents the findings of the project 'Developing e-pedagogies for Inclusion'. The purpose of the project was to study and develop the preparedness of newly qualified teachers (NQTs) to use e-pedagogies for inclusion. The work was supported and funded by the Higher Education Academy (HEA) Subject Centre ESCalate and conducted between January 2009 and December 2010 by the School of Education, University of Aberdeen. This document serves as a final report documenting the work carried out and the outcomes of the project for members of the ESCalate team and educational practitioners.

The project consisted of a scoping survey and follow up visits to a number of mainstream schools in Scotland. The scoping survey aimed to investigate to what extent NQTs are aware of the impact that Information and Communication Technology (ICT) can have on e-pedagogies for inclusion and what the main difficulties in using ICT are as part of their inclusive teaching practice. The follow up visits to schools aimed to investigate in more detail the opportunities and barriers experienced by a small number of NQTs when using e-pedagogies for inclusion and to help better prepare the NQTs in future.

The key findings from the study showed that:

- The research approach enhanced the extent to which e-pedagogies for inclusion can be studied.
- The NQTs surveyed were unaware of the main external and internal forces associated with how ICT can be used as a barrier to inclusion.
- NQT's e-pedagogies for inclusion were narrowly centred on ICT accessibility to curriculum content to support pupils with learning needs within the classroom.
- The study enhanced NQT's ability to reflect and share knowledge and understanding of e-pedagogies for inclusion.
- A common characteristic of the e-pedagogies used by the NQTs was the replication of excluding barriers from traditional learning environments to virtual learning environments.
- The decision by NQTs to use ICT for most or some pupils as opposed to all pupils, impacts on educational inclusion and that new approaches are needed which allow all children to use and share their own ICT alongside the school's ICT resources for learning both inside and outside school.

Such findings have important implications in the future for initial teacher education (ITE), NQTs, Local Authorities and the Scottish Government. These implications include:

- Giving NQTs' time and space to use the full capabilities of ICT when using e-pedagogies for inclusion.
- Empowering schools with the resources and skills to enhance their ICT infrastructures to allow pupils, teachers and parents to use their own ICT for learning inside and outside

school.

- Enabling LAs to enhance learning communities and use ICT to develop closer links between schools, families and external agencies.
- Supporting Government in allowing schools greater power to consider, plan and control the requisition of ICT so that there is greater educational equality between people and schools.

The following recommendations have been provided based upon the findings. This project has highlighted the need to:

- Conduct further research to substantiate the findings.
- Investigate to what extent the pupils who are educationally excluded are also digitally excluded.
- Dispel teachers' and schools' negative views about using some forms of ICT such as mobile phones in classrooms and allow pupils greater opportunity to use and share their own ICT for learning in class.
- Provide all schools with improved ICT infrastructure to support wireless internet access.
- Better prepare teachers to be aware of, reflect and address the barriers to exclusive education caused through the use of ICT and the e-pedagogies they use.
- Further study the effect digital exclusion is having on schools and teachers in particular regions of the country.

This project has begun to raise many more important issues and areas for further research, such as whether school policies to ban the use of mobile phones and whether difficulties using virtual learning environments like GLOW[1] are limiting the full potential of e-pedagogies for inclusive available to teachers. The work is raising the awareness of e-pedagogies for inclusion and well founded principles of inclusion to reflect on how NQTs use ICT in their classroom; an area of research which has received little attention to date but nevertheless is becoming increasingly important with the introduction of Curriculum for Excellence in Scotland.

[1] GLOW – is the world's first national online community for education which provides tools to enhance learning in a safe environment for pupils, practitioners and parents (http://www.ltscotland.org.uk/usingglowandict/glow/index.asp).

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Introduction

The topic of teacher education for inclusive education is an area of growing national and international concern (EADSNE, 2009). Recently, researchers within the Inclusive Practice Project (IP Project) at the University of Aberdeen pioneered an approach to initial teacher education to ensure that teachers have the pedagogical knowledge to respond to the challenges of inclusive education (Florian & Rouse, 2009). Building on this work, the 'Developing E-pedagogies for Inclusion' project piloted an approach to develop e-pedagogies for inclusion for newly qualified teachers (ESCalate, 2010).

In this report ***pedagogy*** *is defined "as both the act of teaching and its attendant discourse and postulates three domains of ideas, values and evidence by which both are necessarily framed"* (Alexander, 2004). In the light of greater use of Information and Communication Technologies (ICT) in education, in this report **E-pedagogy** refers to the study of the process e-teaching – the decisions and strategies NQTs perform when using ICT as part of their teaching.

The literature on the effectiveness of ICTs for teaching and learning is mixed. This is largely due to the complex nature and contexts in which ICT is used within teaching methods. Whilst some have argued that teaching methods have changed little over the centuries, there is little doubt that ICT is having an impact on education (Elliott, 2009). With the recent developments in inclusive education and practice, it is important NQTs take such developments into account when using ICT.

Inclusive education has been defined as *"a process of increasing participation and decreasing exclusion from the culture, community and curricula of mainstream schools"* (Booth & Ainscow, 2002). Florian (2009) suggests that *"**inclusive practice** is what people do to give meaning to the concept of inclusion". Florian (2009) reports that, "in an attempt to become more specific and detailed in answering questions about inclusive education and practice, [Florian and colleagues are] developing the notion of **inclusive pedagogy** … as a lens through which judgments about the process of inclusive education and the activities associated with inclusive practice can be made".*

The process of inclusive education and the activities within inclusive practice do not occur in isolation (Hodkinson, 2005; Jones, 2006; O-Neill et al, 2009). Cousin (2005, p. 118) wrote: *"Pedagogies never live independently of the prevailing media... Technologies work dynamically with pedagogies, not for them, and in the process they become mutually determining."* In spite of the encouraging findings about sustaining pre-service teachers' beliefs and attitudes towards inclusive practice from recent research, such as the IP project (Beacham & Rouse, in press), more studies are needed to ascertain the impact of other inter-related aspects of inclusive education. One such aspect which is related to education inclusion and received very little attention in terms of initial teacher education and teacher professional development is digital inclusion (Milner, 2007; Selwyn & Facer, 2007).

Digital inclusion (or e-inclusion) has been defined as *"Above and beyond having the necessary access to resources, digital inclusion is therefore predicated on the ability to make an informed choice when and when not to make use of ICTs. Digital inclusion is not therefore simply a matter of ensuring that all individuals make use of ICTs throughout their day-to-day lives, but a matter of ensuring that all individuals are able to make what could be referred to as 'smart' use of ICTs, i.e. using ICTs as and when appropriate. In this sense not making use of ICTs can be a positive outcome for some people in*

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some situations, providing that the individual is exercising an empowered 'digital choice' not to do so" (Selwyn and Facer, 2007). Abbott (2007) states that **digital inclusive practice** (also known as e-inclusive practice), is *"a term which emphasises the interaction between digital tools, contexts and people, and focuses attention on the activity of the use of digital technologies by or with people with learning difficulties.* In this report, digital inclusive practice is derived from Florian's (2009) definition of inclusive practice, as what educational practitioners, including NQTs, do using digital technology to give meaning to the concept of inclusion. This derived definition is more fitting since it addresses the issue of including and entrusting all children, not only those with learning difficulties, and includes how NQTs use digital technology for inclusion when working with and through others. Similarly, **e-pedagogies for inclusion** in this report refers to *"a lens through which judgments about the process of inclusive education and the activities associated with inclusive practice can be made which incorporate digital technologies*". Such a framework is intended to address the dilemma for NQTs which relates to determining the effectiveness of using e-pedagogies for inclusion. Its use within this project was intended to explore how NQTs accommodate individual differences using ICT while avoiding or minimising actions that would stigmatise or mark some pupils as different. As opposed to the types of digital technology used, it accounts for the application and affordances of digital technologies which is suggested as one of the main factors when comparing e-pedagogies (Florian & Hegarty, 2004). A more detailed description of the application and affordances of digital technologies are presented in the Theoretical Framework section.

Recent research on digital exclusion shows that the same groups of individuals excluded as part of education exclusion are also excluded within digital exclusion (FutureLab, 2009). These excluded groups are associated with disability, low socio-economic status, parents with no qualifications, minority cultures and looked after children. Consequently, for some children, digital exclusion further exacerbates educational exclusion and capacity to learn. With studies showing that digital inclusion/exclusion is temporal and relative in nature, NQTs' practices can also at times result in deeper forms of exclusion (Warschauer, 2004).

To date much of the research conducted within these two areas remain separate despite the growing evidence that they are inter-related and that digital exclusion can have an impact on education (FutureLab, 2009; UK Online Centres, 2008; Sefton-Green, 2004; Teo & van Schaik, 2009; Yu, 2006).

Whilst there are some developments in the areas of social, educational and digital inclusion and educational technologies, there is no holistic understanding and support of e-pedagogies for inclusion for NQT's. So whilst many NQTs possess positive views and the knowledge and skills for using various digital technologies as educational tools, research suggests (BECTA, 2008; BESA, 2009; Elliott, 2009; Wang, 2008) that they are not adequately aware of the affordances conveyed by ICT and prepared to use ICT as part of their inclusive practices, even when such technologies are available and accessible. Observational evidence suggests that NQTs fail to apply inclusive key principles adequately when using ICT and make use of children's knowledge and skills of digital technologies. The evidence suggests that NQTs tend not to use e-pedagogies in ways that reduce the disruptive affordances of digital technologies.

This topic was identified as being of importance to NQTs in providing them the necessary affective foundation upon which to teach inclusive lessons incorporating digital technology, such as virtual

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worlds (VWs). This is because as Elliott (2009) states "*VWs are not just another educational tool – they provide unique opportunities for teachers and learners, offering unprecedented levels of motivation and emotional engagement. They don't "fit in" with existing pedagogies. Rather, they have the potential to radically alter the educational experience."*

Project Methodology

The aims of the project were:

- To raise NQTs' awareness and understanding of e-pedagogies for inclusion.
- To develop NQTs' use of e-pedagogies for inclusion.
- To explore the impact of using e-pedagogies has on NQTs' inclusive practice.

The work addressed the following research questions:

- To what extent are NQTs aware of the impact e-pedagogies can have on inclusive practices?
- To what extent is ICT considered and used in inclusive pedagogies by NQTs?
- What are the barriers preventing NQTs from using e-pedagogies for inclusion?
- To what extent is the use of e-pedagogies for inclusion by NQT's improved when based on an approach to develop e-pedagogies for inclusion?

The aims of the project were achieved by:

- Targeting NQTs from the 2007 and 2008 cohorts of initial teacher education courses within the School of Education at the University of Aberdeen.
- Using a survey as a scoping exercise, to obtain NQTs' awareness of e-pedagogies for inclusion and the extent of their use in their teaching practices.
- Using focus groups to obtain insights from a sample of NQTs' experiences using e-pedagogies for inclusion and their opportunity to reflect on such practices.
- Using classroom observations and teacher interviews as part of a follow up study to allow NQTs to develop e-pedagogies for inclusion and explore a sample of NQTs' e-pedagogies within their inclusive practices.

The following section gives an account of the theoretical frameworks used to underpin the project methodology.

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Theoretical Framework

Three theoretical frameworks were used in this work with the intention of developing a clearer understanding of the ways in which ICT is used within inclusive practices and of the impact ICT can have on educational inclusion and exclusion. These included 'Transformability', *"a firm and unswerving conviction that there is the potential for change in current patterns of achievement and response, that things can change and be changed for the better, sometimes even dramatically, as a result of what happens and hat people do in the present."* (Hart et al, 2004) The other frameworks used were the Framework for Participation (Black-Hawkins et al, 2007), and the 5Cs of Digital Inclusion (Bradbrook & Fisher, 2004). These frameworks were used within this project to explore how NQTs accommodate individual differences using ICT while avoiding or minimising actions that would stigmatise or mark some pupils as different.

Transformability

Transformability is a pedagogical concept pertaining to learning capacity developed by Susan Hart and her colleagues (Hart, Dixon, Drummond and McIntyre, 2004). The concept represents and alternative way of thinking about learning to the concept of fixed ability. Underlying the concept is a recognition of the external and internal forces which expand or constrain an individual's capacity to learn. These forces, whilst often perceived by educational practitioners to be fixed, are able to be controlled by the choices and actions which teachers make. Consequently, the decisions that teachers make have a significant impact on transforming learning capacity.

At the core of the transformability model are three categories of teaching purposes which teachers need to adopt in their practices: affective, social and intellectual. Affective purposes relate to strengthening all learners' confidence, security, competence and control. Social purposes relate to increasing acceptance, belonging and community. Lastly, intellectual purposes relate to ensuring access, enhanced relevance, meaning and reasoning during learning. To realise how these purposes can be achieved though the choices that teachers make, the concept of transformability includes three key pedagogical principles: 'co-agency', 'everybody' and 'trust'. The principle of co-agency advocates the need for teachers to harness their own power to empower pupils to apply their power. Everybody is a principle which advocates the need for teachers to act fairly and equally in the interest of everybody and to work with and through others to enhance the learning capacity of young people. Lastly, the principle of trust advocates that teachers make their choices from the basis of trusting the learner. This theoretical framework has been used in the new approach to initial teacher education developed in Aberdeen to ensure that teachers have the pedagogical knowledge to respond to the challenges of inclusive education (IPP, 2010).

Framework for Participation

A fundamental aspect of educational inclusion is participation (Black-Hawkins, Florian & Rouse, 2007). The Framework for Participation provides a tool for exploring educational inclusion and exclusion in classrooms, schools and communities. The Framework contains four elements:

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- Participation and access
- Participation and collaboration
- Participation and achievement
- Participation and belonging

To date, the framework has been used to take account of inclusive practice in classrooms and inside schools.

The 5Cs of Digital Inclusion

Whilst the theoretical frameworks described above have shown to be extremely effective in terms of reflecting on inclusive education and practice, their elements and application tend not to focus on the affordances from ICT, particularly in terms of participation and belonging. Consequently, there are few if any examples in the literature where they are used as part of e-pedagogies.

Norman (1992, p. 19) defines affordance as a *"technical term that refers to the properties of objects – what sorts of operation and manipulations can be done to a particular object"*. For example in terms of education, books afford opening and ICT afford accessing information. Perceived affordances are particularly important when designing learning environments since they convey what a pupil thinks can be done. For example does the design of an educational computer game suggest that it should be played on one's own or with one or more players?

Like objects, *"environmental affordances are defined as what the environment permits or provides for interaction, such as objects, people or possible activities in a particular situation."* (Torres-Antonini, 2001, p59) They can be viewed as the opportunities an environment affords or qualities of an environment that invite action. They can also be *"thought of as non-verbal cues for behavior ... that are expressed through, or encoded in, environmental features."* (Torres-Antonini, 2001, p151)

Affordances are conveyed by both the physical and virtual environments which exist in classrooms, schools and learning communities. For example, both the physical and virtual environments offer an array of opportunities for satisfying needs such as presence and belonging (Cobb & Fraser, 2005; Torres-Antonini, 2001). It is therefore important that affordances are built into e-pedagogies for inclusion which facilitate both formal and informal opportunities within the physical and virtual environments to participate and include others (Cobb & Fraser, 2005).

This is important because if an NQT views ICT as an educational tool separate from inclusive pedagogies, it can cloud their practice in terms of how and to what extent the ICT impacts on inclusion. For example, when viewed as an educational tool separate from e-pedagogy, if pupils with dyslexia are provided with access to assistive technologies it is likely that the tool will improve their capacity to learn by limiting the amount of text they are required to read and write.

Whilst ICT can help to support pupils with ASNs access the curriculum, pedagogically it is only part of the picture in terms of using ICT to enhance inclusion. What is often overlooked by NQTs is that ICT is not a neutral partner when applying e-pedagogies. ICT affordances can also inhibit pupils and staff

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from accessing curricula. In terms of educational inclusion, the same situation can result in pupils being excluded from the class to access the tool, or by peers who see such decisions by the teacher as favouring others. Such characteristics of ICT are reported in studies on digital exclusion (Bradbrook and Fisher, 2004).

Bradbrook and Fisher (2004) argue that *'digital inclusion should not be thought of as an "in or out" phenomenon'*. They provide a clearer account of what is meant by ICT access and usage by suggesting that access to ICT is one of five key aspects of digital inclusion which can result in barriers to not just social but also educational inclusion. These (also known as the 5 Cs) are: connection (access), capability (skill), content (medium), confidence (self-efficacy) and continuity (daily life use). For example, connection refers to the way in which individuals access ICT such as the Internet. Capability refers to ICT skills that can improve quality of life for pupils. This includes the ICT skills possessed not only by pupils, but also teachers, parents, support tutors, auxiliary staff, and agency staff and local authority staff. Content refers to relevance and representation of medium, such as in the curriculum (i.e. the medium which forms the learning materials, instructions, assessments and feedback). In this case, confidence refers to how motivated and emotionally prepared an individual is to use ICT. Like capability, it not only refers to pupils but also teachers, parents, etc. Finally, continuity refers to on-going ICT usage, such as pupils' and teachers' progression using ICT to enhance their knowledge and understanding. This also includes the role ICT plays in their daily life and the need for ICT equipment in homes and schools to be updated and barriers to ICT use addressed.

Using these five aspects of digital inclusion alongside the frameworks mentioned above is intended to give NQTs a greater understanding of the affordances conveyed by ICT and the impact it can have on educational inclusion. It is also intended to help NQTs reflect on their practice and provide a shared understanding for discussing aspects of e-pedagogies for inclusion.

Scoping Survey

The scoping survey aimed to provide a vehicle for exploring the ways in which digital technology was used by NQTs as part of their e-pedagogies for inclusion. A pilot survey was first conducted to ascertain the effectiveness of the instrument before circulating it as part of the main study. A pilot survey also aimed to obtain evidence that substantiated the hypothesis that NQTs' e-inclusive pedagogy tends to be informed by e-pedagogies and the pupil's learning needs rather than by inclusive pedagogies.

For example, when a teacher plans to teach a concept, some begin by reflecting on inclusive pedagogies and practices to allow all pupils to participate, but when they come to implement ICT, the application of ICT changes their inclusive practice, and as a result can develop into a differentiated approach. This change in practice to incorporate ICT could result in practice which might not be as inclusive as originally planned, such as when a teacher plans to arrange their class into small groups with each pupil assigned a role. Observational evidence, from school visits conducted as part of the IP Project, has shown that when such arrangements are made, a pupil with autism was left excluded using the computer. The teacher planned to improve the inclusiveness of the pupil with autism by encouraging the pupil to take on a fact-finding role and as part of this role

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be required to use the internet to research a particular concept. Other members of the group were appointed the roles of presenter, editor, graphic designer, etc. Whilst the inclusive pedagogy was well formed and intended, requiring all the pupils to use the same types of digital technology, in this particular case the pupil with autism became isolated working alone on the computer. There was no account of the pupil involving the group in searches, and no account of the group involving the pupil in their associated roles. What had began as an e-inclusive pedagogy resulted in exclusion.

The following study was developed with the intention of identifying both successful and not so successful examples as given above.

Pilot Methodology

A group of 10, from a possible 30, NQTs were targeted to pilot the survey. The NQTs were taking the MSc. in Enhanced Professional Practice (EPP) programme run by the School of Education at the University of Aberdeen. The cohort of 30 NQTs included both PGDE and BEd pre-service teachers who had finished their programme in June 2009 and had become newly qualified teachers. The participants were selected from a group of 11 NQTs who attended a half-day workshop held within the School of Education for NQTs taking the MSc EPP. The person who did not take part in the pilot needed to leave early.

The survey instrument employed in this pilot study was developed by members of the inclusive practice team (see Appendix A). The team was employed to assure basic understanding of inclusive education and practice, and e-pedagogies and digital technologies. The survey consisted of 3 sections. The first section, consisting of 5 items, explored how NQTs use digital technology in their classroom. The second section, consisting of 3 items, explored their use of digital technology as an aid to inclusive practice, and the third section requested NQTs contact details if they wished to be further involved in the project. Of the 8 items contained in the first two sections, 7 consisted of open-ended questions.

The pilot survey was circulated at the end of the half-day workshop to the 10 NQTs, after a short presentation about the survey and the project. Whilst the participants were given 15 minutes to complete the survey, all those which needed slightly longer were happy to stay in order to complete it fully.

Pilot Results

All 10 of the NQTs completed the survey and all reported that they use ICT in their teaching. There was a very broad range of ICT used by NQTs. Examples of ICT used included digital cameras, interactive whiteboards, websites (such as SpellingCity[2], World Maths Day™[3], EducationCity[4]) and Microsoft Office applications. One NQT reported using handheld devices such as Alphasmarts and

[2] SpellingCity - http://www.spellingcity.com/

[3] World Maths Day™ - http://www.worldmathsday.com/

[4] EducationCity - http://www.educationcity.com/

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portable game consoles running Guitar Hero and Brain Training software. All NQTs also reported using two or more types of ICT. The most reported types of ICT were interactive whiteboards, websites and digital cameras. Only four out of the ten NQTs reported using GLOW. Of these four NQTs, only one mentioned that they used GLOW groups to create class material. One other NQT reported that they thought GLOW was very hard to use and that their school did not really use GLOW at present. NQTs report using ICT for: pupil enjoyment, interest, addressing shyness, recording evidence of learning, recording classroom events, evaluating learning, accessing, collating and sharing resources, informing parents, formative assessment, multimedia learning, improving engagement, imagination and creativity, documenting progress, producing learning materials, collaboration, cross-curriculum activities and visualisation.

Seven of the NQTs reported that they had changed their practice to accommodate ICT. Of these seven NQTs, one mentioned that they had changed the way they used ICT to reflect cross-curriculum activities. Another NQT reported that they changed the way they used ICT to target areas where children needed support and to reduce the extent to which children received additional adult support.

Eight of the NQTs reported using ICT for ASNs. The types of ICT used for pupils with ASNs included Alphasmarts, note taking tools, voice recording tools and e-learning tools such as e-chalk. The two NQTs that reported they did not use ICT for ASNs, implemented ICT into their teaching but not specifically for pupils with ASNs.

Overall, it could be interpreted that nine of the ten NQTs used digital technology either as part of conventional e-pedagogies used within the school or conventional support procedures for pupils with ASNs. It is clear from the survey that the majority of NQTs do not allow all children to use assistive technology, and those pupils with ASNs that were allowed, use it only when the teacher authorises it is alright to do so. Only one NQT could be seen to have used digital technology as part of e-pedagogies for inclusion. This NQT reported *"Included it [e-pedagogy or inclusion] in planning document… Asking children how they would like to record work… [and] everyone encouraged to use [ICT]"*. That said, other NQTs could have used e-pedagogies for inclusion but failed to report it. For example, the NQT that reported using ICT to target areas where children needed support and to reduce the extent to which children received additional adult support might have adopted this strategy for a number of reasons as a way to improve inclusion. They might have felt that involving an additional adult would change the dynamics of the relationship between the pupil with ASNs and the rest of the class. By using ICT the NQT might have felt it provided opportunities for other children in the class to help the pupil with ASNs. Further investigation is therefore required to explore how the application of e-pedagogies is used for inclusion. Interestingly, no NQT reported issues of disruptive technology, and no account was mentioned by NQTs in terms of sending pupils to their school's Learning Support Centre for additional support and to use the centre's ICT. No account was mentioned by NQTs in terms of how their e-pedagogies reflected inclusive practice. The findings seem to support the view that ICT is a tool for communication or learning. None of the NQTs reported that they used ICT to help pupils participate in group activities or to develop a greater sense of belonging and trust. There was also no account of co-agency given by NQTs where they had used ICT.

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By the end of the workshop the group of NQTs conveyed a sense of support towards the project. Only one NQT reported being against the increased use of ICT in education because of implications for reading and writing books. From the completed surveys, seven NQTs reported that they would be interested in being further involved in the project.

Discussion

Findings from the pilot survey showed that NQTs use ICT in two broad ways. They used it either as a learning resource for most of the class, or as a support tool for some pupils with ASNs. An important aspect of e-pedagogies for inclusion is that the ICT is implemented for all learners, as opposed to 'some' or 'most' learners, that all pupils are empowered to choose whether they wish to use ICT, and if so, where possible what and how ICT is used. Since there were few accounts of pupils with ASNs using ICT to participate more fully within classroom activities, the extent to which e-pedagogies for inclusion are evident from the findings was inconclusive. The findings do, however, help to identify individual cases that were suitable for further investigation within the next follow up stage of the project.

Limitations

Whilst piloting the scoping survey was a useful exercise to establish the effectiveness of the instrument, the activity was performed in a closed and controlled setting, using a paper-based format and based on face to face communication. Consequently, most of the NQTs completed and returned the survey.

Main Scoping Survey

Since the findings from the pilot survey were encouraging, and no major problems were found with the instrument, the survey was also emailed to 233 NQTs who completed their PDGE course at the University of Aberdeen and who had agreed to be contacted as part of further research. These NQTs were selected from the two cohorts 2007-2008 and 2008-2009. The survey was also emailed to those NQTs who were taking the MSc. in EPP programme but who were unable to attend the workshop. Based upon an expected response rate of 30% it was expected that around 70 NQTs should return their survey. However, no additional emails were received. It emerged that many in the cohorts were subsequently enrolled on the MSc EPP course and had, therefore, already completed the survey as part of the pilot exercise.

Encouraging NQTs to return completed surveys remotely as part of an open and dynamic online setting has many challenges. Reports suggest a good response rate is approximately 26%-44% of the population (Bryman, 2008). However, while larger online surveys are cheaper to administer, the larger the population the lower the response rate tends to be. In the literature, it is also reported that online surveys are returned considerably more quickly and with fewer unanswered questions than, for example, postal surveys, and that open questions tend to be more likely to be answered

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online and to result in more detailed replies (Bryman, 2008). For this reason open questions were created and an online survey approach was used.

14 of the 233 (approx. 6%) NQTs completed and returned the survey by email. The ICTs used by the NQTs tended to be similar to those listed in the pilot survey. These included digital cameras, interactive whiteboards, websites, and Microsoft Office application. Only 4 NQTs reported using GLOW. Thirteen of the NQTs reported using ICT for pupils with ASNs. Such ICTs included Alphasmarts, laptops, specific software (such as Day Dream Business Studies CDROM), PC tablets, websites, screen readers (such as Read & Write), voice recognition software, WordShark, SpellingCity, educational games. Interestingly, no NQT reported using GLOW for pupils with ASN and no NQT reported giving all pupils the same opportunities to use the ICT that was made available to pupils with ASNs. Instead NQTs tended to target specific types of ICT for particular pupils with ASNs.

Similar to the pilot survey, NQTs reported using ICT for many of the same reasons. All of the NQTs reported that they had changed their practice to accommodate ICT. These reasons included wanting to make greater use of ICT, wanting to improve pupils' motivation and engagement, wanting to support pupils' with ASNs learning difficulties, or wanting to increase their own ICT skills and confidence. All the NQTs reported that ICT created barriers towards learning. They reported having difficulty using ICT, not having enough time to prepare, the unreliability of ICT to work properly, lack of ICT in classrooms, and having difficulty scaling resources for large groups.

Clearly the small response rate from the main survey was disappointing. In adopting this approach it highlights an issue only targeting NQTs with access to the internet. Restricting the survey to online populations could have been an issue for some NQTs that may themselves be considered digitally excluded. It is therefore important that future research considers carefully the extent to which NQTs who return the survey are themselves digitally excluded. This finding also has implications for NQTs when adopting e-pedagogies for inclusion for example in cases that require set homework for pupils to be completed online.

Out of a total of 24 respondents from the pilot and main surveys, seventeen reported that they were interested in taking further part in the project. Results of the follow up stage of the project are presented in the next section.

Follow-up Study

The follow up study aimed to provide a clear account of how NQTs implement and use ICT as part of their inclusive practices.

Follow-up Methodology

Five participants were chosen from the scoping survey (2 secondary and 3 primary schools) to take part in the follow up stage of the project on the basis of school location being relatively close to Aberdeen. The participants had also reported that they felt well prepared to deliver sessions using ICT which were for all their pupils. In four of the five cases, NQTs provided time after their session to

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be interviewed about their e-pedagogy for inclusion. This resulted in obtaining a relatively large and rich data set. The four case studies were examined in order to investigate the use of e-pedagogies and their impact on classroom inclusion.

Table 1: Codes and definitions used to analyse data

Code	Definition
Connection	Pupils and teacher has access to ICT (speed, quality, location) – (Bradbrook & Fisher, 2004)
Capability	Pupils and teacher possesses ICT knowledge and skills (technical, social, critical, creative) – (Livingstone, Bober & Helsper,2005)
Contents	Pupils and teacher able to comprehend and utilise content/curriculum using medium (Bradbrook & Fisher, 2004)
Continuity	Availability of ICT in pupils' and teacher's everyday life – (Dutton & Helsper, 2007)
Confidence	Pupils and teacher confidence using ICT – (Haddon, 2000)
Co-agency	Pupils and teacher learn together as equal partners – (Hart et al, 2004)
Everybody	Teacher works with and through others to teach all pupils – (Hart et al, 2004)
Trust	Teacher, pupils, parents, and agencies trusting each other – (Hart et al, 2004)
Object for inclusion	Learning about inclusive ICTs such as how to use an Alphasmart – (Moonen & Kommers, 1995)
Tool for inclusion	Using ICT such as an Alphasmart and other ATs in the classroom for completing assignments, collecting data, communication, documentation, researching topics. Typically, AT used independently from the subject matter (i.e. inclusion) – (Moonen & Kommers, 1995)
Medium for inclusion	Using ICT to teach inclusion to teachers, pupils, parents and other parties. Using ICT to teach learners about the principles and strategies of inclusion – (Moonen & Kommers, 1995)
Participation and access	Pupils and teacher being in the class using ICT – (Black-Hawkins et al, 2007)
Participation and collaboration	Pupils and teacher learning collaboratively using ICT – (Black-Hawkins et al, 2007)
Participation and achievement	Pupils and teacher performing shared learning achievements using ICT – (Black-Hawkins et al, 2007)
Participation and belonging	Pupils and teacher showing a sense of recognition and acceptance of diversities when using ICT – (Black-Hawkins et al, 2007)

The participation framework was modified to provide a 'lens' through which to observe inclusive practice using ICT (see Appendix B). The framework was modified to take into consideration the key elements of the digital inclusion '5 Cs' framework. It also included identifying the nature in which the

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ICT was used: object, tool and media. The modified framework resulted in an instrument which provided a greater picture of e-pedagogies for inclusion currently not possible which the original framework. The modified participation framework was used to observe and produce notes of the inclusive practice and e-pedagogies of each NQT visited. Interviews were held with the NQTs after observing their practice to explore deeper into issues which arose during the observation. Interviews were unstructured and conversational to allow the NQTs freedom to answer in their own terms and time.

The observations were focused on a range of issues faced by NQTs when trying to teach inclusively using ICT, the strategies by which they coped, and the variations in their experiences. The focus was very much on the strategies of NQTs, for example, whether the impact of NQTs e-pedagogies for inclusion on pupils was far greater than is often appreciated.

After the visits, the notes and framework were used to create case studies. A further account of each visit is described in the form of a case study (see Appendix C). Interviews were transcribed using the external organisation 1stclass Ltd (http://www.1stclass.co.uk/). Where available, policy documents were also obtained from the schools' website to supplement the data. Observational notes and transcripts were converted into RTF document files and then entered into Altas.ti for analysis.

The notes and transcripts were encoded using codes derived from the modified participation framework (see Table 1). For example, notes were encoded with the code 'connection' whenever it was observed that the NQT or pupils had difficulty accessing ICT or information via ICT due to its speed, quality or location, whenever pupils' differences was not accommodated due to ICTs' speed, quality or location, or whenever, the actions performed by the NQT stigmatised or marked some pupils as different due to ICTs' speed, quality or location.

Follow up Results

Table 2 gives a summary of the key characteristics of each case study. The table shows the extent of the variation and complexity of the case studies contexts. It is important to bear in mind that these case studies represent only a snapshot of the context taken from a part of the day. Such contexts could be perceived as very different if taken at another time of day, day of the week, week of the year.

The case studies featured four very different e-pedagogies. Case study 1 centred on the NQT using a PC and data projector to teach a class of secondary pupils about supportive learning environments and how to determine whether a learning environment is supportive. Case study 2 required each pupil in the class to research health exercises as part of their science curriculum and create a poster of the health activities they take part in. The pupils with ASNs were provided with wireless laptops to reduce the amount of writing required. Case study 3 entailed a class of pupils working in pairs to create a concept map on the topic of pirates. The ICT laboratory session pupils with ASNs were removed to receive additional literacy and numeracy support. Case study 4 involved a class of pupils developing a short digital video to promote their school to up and coming primary pupils. The class was split in to three groups responsible for titles, filming and interviews. A detailed account of the case studies is available in the Appendix C.

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Table 2: Characteristics of learning environment in each case study

Code	Case 1: BHS (Secondary)	Case 2: HS (Primary)	Case 3: MS (Primary)	Case 4: PS (Secondary)
Class size	14 S1s pupils	22 P5s pupils	28 P3s pupils	20 S1s pupils
Teacher gender	Female	Male	Female	Female
Teacher age range	Young NQT	Mature NQT	Young NQT	Mature NQT
ICT available	3 PCs, 1 IWB	2 PCs, 1 IWB, 5 Laptops (1 connected to camera projector)	1 Laptop, 1 IWB, 1 PC, Lab of 17 PCs	1 PC, Data projector, Digital camcorder, Digital audio recorder
Used Internet	No	Yes	No	Yes
Used VLE	No	To print	To print and upload work	No
NQT used own ICT	Hard drive, USB stick, Camera	None	Laptop	Laptop, MP3 player
Pupils used own ICT	Some only at home	Some only at home	Some only at home	Some only at home
Pupils access to mobiles	Only at break and outside school	Only outside school	Only outside school	Only at break and outside school
E-pedagogy	Multimedia delivery	Research and development	Brainstorm and educational game	Media production
E-pedagogy for inclusion	Inclusive learning environments	Access to curriculum	Access to additional curriculum	Group participation

In table 3, the figures represent the number of affordances for inclusion observed within each case study. It is important to bear in mind that the figures signify experiences recognised by the researcher. The figures should not be interpreted as comparative, since all experiences tend to be different in nature and mean different things to different individuals.

Table 3 shows that affordances relating to connection and capability featured more than content, continuity and confidence. Access and skills seemed to be the main technological barriers inhibiting

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exclusion. A possible reason for this is that whilst in each case the NQTs had implemented the ICT in highly controlled ways, due to unforeseen circumstances, the ICT did not operate as intended. Issues of continuity did not feature highly. A possible reason for this could be because the NQTs did not take into account pupils' prior knowledge of ICT as part of pupils' daily lives. Consequently pupils tended to be instructed when, where and how to use the ICT for learning when actually they were perfectly capable of working the ICT.

Table 3: Frequency of codes associated with each case study

Code	Case Study 1	Case Study 2	Case Study 3	Case Study 4	Total
Connection	18	31	40	29	118
Capability	29	26	24	32	111
Contents	8	9	17	9	43
Continuity	6	12	14	11	43
Confidence	4	9	13	9	35
Co-agency	16	28	34	32	110
Everybody	13	16	15	5	50
Trust	7	9	14	9	39
Tool for inclusion	13	12	11	2	38
Object for inclusion	3	6	15	10	34
Medium for inclusion	1	0	1	1	2
Participation and access	18	24	26	28	96
Participation and belonging	13	12	21	27	73
Participation and collaboration	7	22	27	17	69
Participation and achievement	11	11	11	18	51
Totals	167	228	279	238	912

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Table 4: Summary of digital and educational inclusive characteristics observed in each case study

Code	Case Study 1	Case Study 2	Case Study 3	Case Study 4
Capability	Unused	Used most of the time	Used most of the time	Used some of the time
Co-agency	No co-agency	some co-agency	little co-agency	full co-agency
Confidence	NQT Lacks confidence using ICT	NQT Very confident using ICT	NQT Mainly confident using ICT	NQT Confident using ICT
Connectivity	Only teacher	Only pupils with ASNs	ICT available to all pupils	ICT available to all pupils
Contents (Digital)	Available to all in class	Available to some in class	Available to all in class and some outside school	Available to some in class
Continuity	NQT regularly uses own ICT in class	Class regularly use ICT in class	Class regularly use ICT and make available on VLE	Class regularly use ICT in class
Everybody	Working with and through others	No working with and through others,	Working with and through others,	No working with and through others
Medium for inclusion	Conveying messages and affordances about supportive learning environments	n/a	n/a	n/a
Object for inclusion	n/a	n/a	n/a	n/a
Participation and access	Very little	Some	Most	All
Participation and achievement	Very little	Some	Most	All
Participation and belonging	Very little	Not ASN pupils	Not ASN pupils	Some ASN pupils
Participation and collaboration	Very little	Some	Most	All
Tool for inclusion	For teaching and learning	For teaching and learning	For teaching and learning	For teaching and learning
Trust	No trust	Some trust	No trust	Full trust

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In terms of the NQTs' inclusive pedagogies, affordances relating to co-agency featured more highly than trust or everybody (working with and through others). A possible explanation could be that whilst NQTs used their own ICT powers to affect how their pupils choose to use their ICT power, the choices available were very often teacher-directed and narrow. Furthermore, the way ICT was used seemed to be implemented to match pupils' needs as opposed to deliberately being left open to provide space for the pupils to make their own choices.

In terms of the nature in which the NQTs used ICT, affordances conveyed ICT as an educational tool. Very few affordances conveyed ICT as an object or tool. A possible explanation could be that many NQTs are educated to perceive ICT as a tool. Since NQTs are not expected to have an advanced knowledge of computing or media, it is not surprising that they do not perceive ICT as an object or medium.

In terms of participation, affordances relating to access and collaboration featured more highly than achievement or belonging (recognising and accepting diversity). It is not surprising that affordances for access and collaboration featured highly given the affordances for connection and capability. A possible explanation could be due to the NQTs' unpreparedness to design positive affordances for belonging into their e-pedagogies and virtual learning environments.

Table 4 gives a summary of the digital and educational inclusive characteristics which were observed in each of the case studies. For example, in case study 1 the ICT capability of pupils seemed to go unused, as opposed to case study 2 where the ICT capabilities of pupils were used most of the time.

E-pedagogies for participation and access

Using ICT to access resources when participating in activities showed sometimes to be a particular barrier to learning. Such ICT barriers emerged as a consequence of not just technical but pedagogical factors associated with pupils' identity and empowerment and with the NQTs' views and decisions.

In case study 1, one of the main problems of access during pupil participation was caused because the teacher's hard drive would not connect to the classroom desktop. Consequently, the learning activity planned by the NQT was initially not possible until the pupils were presented with the digital materials located on the NQT's hard drive. Whilst the class waited for technical support to arrive, the pupils were left in their selected seats. For one particular pupil, this meant sitting alone until the issue was resolved. It transpired that even if the NQT had the knowledge and skills to resolve the problem, the problem would still have required the technician who was called because the NQT did not have administrator rights to the desktop. With the NQT's attention distracted by technical issues barriers to learning and participation can develop.

In case studies 2 and 3, barriers related to participation and access were less technical but pedagogical in nature. In case study 2, access to ICT was restricted to those children without ASNs whereas in case study 3, access was restricted to those children with ASNs. In each case, in spite of all the ICT being fully operational and had internet connectivity, the decision made by the NQT to restrict the access of ICT had implications for inclusion in terms of class participation. In case 2, the NQT's decision only to allow pupils with ASNs to use ICT resulted in these pupils being located away from the rest of the class. Whilst the decision helped the pupils access the curriculum it did not

encourage class participation with their peers. Similarly, in case study 3, the decision made by the NQT to have pairs of pupils working on the computers together resulted in little whole class participation. Furthermore, the decision to have pupils with ASNs leave the class for some of the activity whilst the pupils learning literacy and numeracy needs were addressed, excluded them from taking full part in the class. It identified them as different and needing separate support.

In case study 4, a key barrier regarding access to participation was in terms of lack of ICT resources. All pupils were enthusiastic and motivated by the activity but some pupils were required to take a lesser role because of the limited ICT resources available. On some occasions this role was as a bystander who for one particular pupil with ASN resulted in him feeling excluded.

These findings showed that whilst NQT's good intentions were to use ICT to enhance inclusion through participation by improving access to the curriculum, in reality the ICT caused exclusion. It is therefore important that NQTs develop a sense and awareness of ICT barriers which restrict or inhibit learners from accessing resources as part of class participation.

E-pedagogies for participation and collaboration

The use of ICT during collaboration between pupils when participating also showed to be a particular barrier to learning. Such barriers seemed to arise as a consequence of decisions made by the NQTs regarding inclusive pedagogies and e-pedagogies.

In case study 1, the use of ICT resulted in most of the collaboration being between the NQT and individual pupils. There was little collaboration between the pupils themselves. Consequently, in spite of the NQT's efforts and availability of unused ICT, this resulted in excluded pupils failing to engage and participate in the activity.

In case studies 2, 3 and 4, the use of ICT resulted in varying levels of collaboration between pupils. In case study 2, there was collaboration between pupils who had no ASNs sat at each table, where as the pupils with ASNs using the laptops seemed not to collaborate as much. Similarly, in case study 3 the pupils mainly collaborated in pairs. Only in case study 4, did there seem to be full collaboration between the pupils.

E-pedagogies for participation and achievement

The use of ICT to enhance participation and achievement between pupils showed to be another particular barrier to learning. Such barriers also seemed to arise as a consequence of decisions made by the NQTs regarding inclusive pedagogies and e-pedagogies.

In case study 1, whilst the use of ICT helped all the pupils achieve an awareness of what a supportive learning environment was, ironically, the one example showing the use of ICT conveyed negative messages. Furthermore, there seemed to be a divide in the pupils' achievement in terms of demonstrating their understanding and application of a supportive learning environment. It seemed that the pupils who were unwilling to engage were facilitated by the mode in which the ICT was used.

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In case studies 2, 3 and 4, the use of ICT for participation and achievement between pupils varied widely, not just between cases but also between individual learners. For some of the pupils with poor levels of achievement this was inhibited because of their negative views towards ICT. For other pupils their achievements were restricted by the lack of knowledge and skills to use ICT or by the lack of ICT opportunities entrusted them by the NQT. In case study 3, there were also examples where in each pair one pupil dominated computer interaction.

These findings showed that whilst NQT's good intentions were to use ICT to enhance inclusion through participation and achievement between pupils, in reality the ICT did exclude. It is therefore important that NQTs develop a sense and awareness of ICT barriers that restrict or inhibit the achievement for pupils as part of class participation.

E-pedagogies for participation and belonging

One particularly interesting result is associated with observations made of e-pedagogies for participation and belonging. Such observations whilst initially seemed to be positive in terms of class identity were shallow when analysed in greater depth. All the primary children in both cases seemed to show strong tendencies towards belonging to their class. All the children seemed to recognise and accept each other's differences and were unaffected by those with ASNs receiving additional support whether delivered by ICT or through face-to-face tutoring. Belonging to a class seemed less of a case in the secondary cases. In the secondary cases, the pupils seemed to show a greater level of belonging to their subgroups. Furthermore, the pupils in case 4 seemed very much more accepting of diversity than in case 1. In case 4, the pupils seemed less critical and judgemental of one another. In case 1, despite the use of ICT to help include all the pupils, the pupils' behaviour, attitudes and beliefs towards each other were central to whether the ICT actually included individuals. In case 1, the individuals' identity seemed to be replicated in the virtual learning environment; whereas, in case 4, some pupils were able to take on different identities in the virtual learning environment which resulted in stronger acceptance tendencies in the classroom environment. For others who were unable to fully exploit changing their identity, the use of ICT failed to make much of a difference in terms of inclusion. The e-pedagogical decisions made by the NQT seemed to be reinforced within or through the ICT. In each case the e-pedagogical decisions made by the NQTs seemed to impact on the amount of space available for interaction and participation between learners and had either positive or negative implications for inclusion.

Interviews

The interviews aimed to gain a greater understanding of the actions performed by the NQTs in their observed session in terms of how they accommodated individual differences when using ICT while avoiding or minimising actions that would stigmatise or mark some pupils as different.

From the interviews, all the NQTs felt they had used ICT in a way that accommodated pupils' differences whilst avoiding or minimising actions that would stigmatise or mark some pupils as different. One NQT mentioned that:

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"For [Pupil X], it ... was the first time he'd tried using it [Alphasmart] for extended writing and I was amazed at the difference and …I've got him on film saying, 'look, I've managed to do excellent' and he basically says, if I didn't have this Alphasmart, if I was writing, I'd be going so slowly that I'd probably only get satisfactory."

Whilst such an example illustrates the benefits of using ICT to help improve the inclusion of pupils with ASNs in terms of accessing the curriculum and achieving difficult tasks, as the framework for participation outlines, inclusion also consists of other aspects such as participation and belonging. It is these other aspects of inclusion which were not commented on. One explanation might be that the NQTs were unaware of the impact ICT can have on these aspects, whereas planning and observing access, collaboration and achievement were more tangible elements to perceive. From their comments, it seemed less obvious to the NQTs how ICT accommodated pupils' differences while avoiding or minimising actions that would stigmatise or mark some pupils as different.

One key area of inclusion is including all pupils. Introducing ICT into the classroom for specific pupils does produce additional tensions which if not addressed, can manifest into internal and external forces. Whilst for some pupils using such ICT can be an inclusive experience, for others it can be an exclusive experience, depending on how well other pupils in their class accept the arrangement enforced by the teacher. One of the NQT mentioned that:

"... some of the other pupils did say, 'why can't I do that, why can't I do that?' So it is difficult to manage in some respects."

To resolve such an issue many of the NQTs try to implement ICT for everybody. One NQT spoke of how she implemented the ICT for everybody to try and make the learning objectives of the session as basic as possible in order to include the huge range of pupils' abilities in the class. This resulted in signs of frustration by the NQT that not all the pupils were engaged, despite reporting that she had planned the activity to address issues such as of pupil embarrassment. She mentioned that:

"I did try and choose things that I … thought people would cope with ..., especially when you've never done something like that before, I guess now we've done it, if we continue to do it, it would break down a, kind of, barrier about that type of thing."

Whilst the NQT had planned to use the ICT to enhance access to the subject, they had not realised that the way she had used the ICT gave some pupils the space to disengage from the class, since none of the photos or videos included examples of their experiences.

Another key area of inclusion is working with and through others. In one case the NQT mentioned that working with and through others was commonplace when using ICT. She mentioned that:

"there's a support network of people with different areas of expertise [to help with using ICT] and definitely here people are willing to share ... and there's another probationer who is a computing teacher so I guess I had a process in my head that there were some safety nets for learning with that kind of thing and like we were saying before the pupils are quite good at that too."

This illustrates that NQTs do perceive working with and through others as part of their e-pedagogies for inclusion. However, as the NQT later realises, not all these safety nets can be called upon as and when required. In one of the cases, it took a considerable length of time for a technician to answer the NQT's eventual call for help. Whereas on some occasions ICT problems can help build an

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inclusive community, on this occasion the pupils were not as willing and able to help and the NQT reported that she lacked confidence in asking for assistance. She said that:

"But now that that's happened, that would make me more confident in the future to contact them [technicians] and the times they have helped me they've been really good …but I probably don't contact them as often as I should, I probably shouldn't feel so bad about just asking things."

Working with and through others to improve inclusion is not just about improving the collaboration between teachers and support tutors or educational psychologists, schools and authorities. This illustrates that there are many others within the school community in which NQTs work, such as technicians and parents who have a role to play in helping to include pupils.

In spite of the negative and disruptive aspects of ICT there are many good examples of e-pedagogies for inclusion which the NQTs try to emulate. One NQT mentioned that:

"We did our Burns poetry and the kids went off. Once they knew the words they would go into a quiet place and they stood there and read their Burns poem out on to the mic and then I uploaded them all onto the blog, so all the parents who choose to access the blog got to hear their poems being recited. That was nice because you can't invite all the parents, especially a big school like this. There's 400 odd pupils and you couldn't have a whole school Burns Recital or something like that".

This illustrates that some of the NQTs see that in the right hands ICT can be, and is being, used in the classroom, and can be used to enhance inclusion in the community as well as in the school.

Trust is a very important aspect of inclusion. In terms of ICT, there were occasions when there seemed to be contradictory levels of trust being conveyed between the NQT and the pupils. On the one hand, the NQT mentioned that *"obviously it's my own equipment but I can trust them with the stuff"* and on the other, the NQT mentioned that *"some of the pupils [but not all], I can, kind of, trust to sit at her desk [the teacher desk whose room it is] and not nosey at stuff".*

This illustrates that when some teachers reflect on aspects of trust it is important that they not only consider the relationship between the teacher and pupil in general but also the situations, places and objects (such as ICT) which impact on such trust. Whilst such situations, places and objects often correspond to exceptions in the mind of the teacher, from the perspective of some pupils the actions of the teacher affords messages of difference and stigmatisation, and can lead to exclusion.

Trust is one of the issues at the centre of pupils using mobile phones in school. All the NQTs felt most of their pupils had either their own mobile or had access to one. Whilst most could understand why mobiles had been banned by the school, they were also sensitive to the fact that many of their pupils would benefit from using their phones in class for learning. All the NQTs felt trust played an important part when allowing pupils to use ICT. One NQT mentioned that:

"We have a flip camera in class. I was absolutely terrified that someone would drop it in water. But then I thought no, they're doing it not me. So even though I'm terrified that they are going to drop it in the water, but every few minutes I kept saying, 'don't hold it over water, could you step back a bit'. I thought god I sound like a right nagging wifey. But there is always that. Somebody actually dropped a jotter in the water later on. They hung it out somehow and just went 'oh oops'. See I just thought that could have been a camera, but thank goodness it wasn't".

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Another NQT mentioned that: *"... they use my phone for recording. They use my phone it has two dice on it, I don't know if you've seen that. It's a Samsung thing. But one of the things is if you set it onto this dice thing, you shake it, it sounds like two dice in a cup".*

And another NQT mentioned that:

"I even heard - the boy with the red hair ... saying one day to the person he was working with 'I don't think we can put that because I think that might hurt her feelings'. I think at that age to have that level of responsibility is remarkably well... But I remember that really clearly because I was actually quite proud of him. Because in a classroom setting, he's the one who always shouts out, he's the one who always gives the answer when you're asking somebody. But for him to say that that day I thought, oh well that's good because it shows you can just stop and think and take a step back ... before you type".

Although there will be incidents and accidents, these comments illustrate that through trust there will also be successes. It is important schools invest in ICT that is robust and hardy and can be dropped and well used by everybody. Whilst some teachers are entrusting pupils to use their ICT devices in class, at the same time pupils need to understand that it is their responsibility to look after resources whether it is their own or borrowed from others and that trust needs to be earned. The school environment is an ideal place to develop these e-skills within a learning community.

Another area NQTs need to be aware of when using ICT is to what extent their views are deterministic in nature. It was interesting to note within the interviews how some NQTs' views towards some pupils' use of ICT at home could be interrupted as deterministic views about pupils' achievement. One NQT mentioned that:

"... there's one or two of them [pupils] that will go home and will log onto the computer, maybe play about on spreadsheets and do stuff … they come in with things that they've done at home on the computer and they're the ones that really need stretched a bit more".

This illustrates that deterministic views about pupils' abilities go beyond what teachers perceive pupils are capable of doing in the classroom. Assumptions about the ICT skills that pupils use at home for learning can result in teachers making misguided decisions about pupils' abilities in the classroom. One NQT took the decision to not make information and learning materials available to the pupils and parent outside school via the internet because:

"Some of the parents, it's difficult…it's not making an excuse but some of the parents, I mean, I know that a few of the parents, like, say, for [one pupil], for example, lives with his granny because his mum and dad are drug addicts and stuff."

This illustrates that some teachers do have ICT views towards pupils' circumstances, such as of older guardians and parents in certain situations being less likely to have access to and use ICT, that can impact on their actions within their inclusive practices.

Access to ICT was one of the more observable aspects of inclusion. One of the main issues reported by the NQTs was a lack of school ICT resources, in particular, hardware such as laptops, desktops, camera, and internet access. All the NQTs mentioned the difficulties of balancing inclusive practices with the lack of inclusive ICT. One primary NQT mentioned that:

"they've [pupils have] got to learn to take turns so that's one of the things when you're using this [IWB], you've got to teach them to take turns, about the waiting bit and not shouting out because somebody's putting an

answer up, but it's difficult because I know they go home and play with their Nintendo Wiis, that have got a multi function interaction, two player system and they're coming into the classroom and they're having to not only learn how to share but also to share one person at a time on these types of things."

This illustrates the difference between affordances conveyed by ICT at home and at school. Such affordances do impact on the way pupils recognise and accept individuals' differences and diversities. At home networked multiplayer systems can facilitate inclusion by encouraging individuals to work together simultaneously on the same task, such as racing against each other, whilst at school standalone single user systems can inhibit inclusion by intensifying individuals' limitations and differences .

When asked if pupils should be allowed to use their own ICT in school, all the NQTs reported issues adopting this approach. One mentioned that: *"there's issues over stealing, there's been a lot of stealing in the class".* Another mentioned issues over timetabling. "I've worked in a school where's there's been an ICT suite and you go there for your computing and you come forty years into the dark ages back in the classroom, sort of, but I'm quite pleased we've got laptop buses here, I think that does promote inclusive practice because you're not taking them out the classroom ... to go and do specifically computer related ICT task, in the classroom you can support them with their language and their maths and with the use of ICT".

Some NQTs voiced concern about being videoed and the distractive nature of ICT, and the fairness of owning technology which was not available to all. This illustrates not only the exclusive nature of ICT within schools but also between schools, particularly between more and less prosperous schools. This illustrates that, as with many forms of technology, individuals need to be taught how to use them correctly and effectively, and penalties explained and enforced if caught abusing such powers. Banning certain forms of ICT is not a long term solution in education. Instead it is important to educate individuals about how to use and share ICT to include others.

Whilst the NQTs did not have a comprehensive understanding of the impact ICTs can have on inclusive practices, some of them were more awareness than others. One particular NQT was particularly mentioned that:

"... sometimes they'll [a pupil] say things like 'well I don't get to go on it because my dad plays poker'. Or 'I don't get to go on it because my mum's on Facebook'. So having it in the house doesn't necessarily mean they get to use it".

Yet, another NQT mentioned that:

"... there were two things I was very aware of. One would be the difference in ability, and the other would be difference in access. Because Peterhead is a very deprived area now, and we have got, in terms of the demographics of the kids, we've got kids who come from what are relatively affluent families, and what are relatively deprived families. And it's something that I have been aware of with all of my classes through the year, I have to watch what I ask them to do, because I know that they don't all have an MP3 player, or they don't all have access to a computer at home. So from that respect I knew that what I had to do I had to be able to contain it within the school where I could provide them with the technology. So that's why a lot of their homework might be to go and write a little paragraph on something, or to have a think about a particular aspect, and then bring it into the class, which is what we had today; they'd gone away, thought about songs and come back. In terms of the abilities and competencies with IT, what we did do right at the start was we did a little bit of personal writing, it was almost like writing a lonely hearts ad, with, 'this is the kind of person I am, these are the things that I'm good at, these are the things that I'm not so good at.' And then I tried as far as

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possible to organise the group so that we had somebody who is a natural leader, we had somebody who felt they were good with IT, we had somebody who felt they would be good in front of the camera, somebody who's a good writer. So I've tried as far as possible to mix their abilities there, mix their skills and hopefully they will be learning from each other".

This illustrates how extremely complex and challenging it is for NQTs to be prepared for inclusion. In terms of ICT, it is important NQTs not only have an understanding of the virtual affordances conveyed by ICT but also the external and internal focused at work outside the school. Such insight is particularly important when teaching pupils who are members of traveller families.

In terms of co-agency when using ICT, excluded pupils can miss out on opportunities and choices which are given to the rest of the class. One NQT mentioned that:

"The others who came back, they were quickly back into it and they did what they needed to do. But he [a pupil] was just maybe slower to get typing. But she [the support teacher] brings them back into class and I'd [the teacher] already chosen their activities".

This illustrates that the NQT was making decisions for excluded pupils when the rest of the pupils in the class were being trusted to make their own decisions about what learning task they preferred to do. Such difference in treatment is often recognized by pupils and can lead to the pupil resenting leaving the classroom.

Another account of co-agency is summed up by one of the NQTs when she says:

"I think as well once they've used something like that once, they're the ones who suggest. They're the ones who come and say 'can I do that'. Then you think well they're the ones deciding whether a particular piece of technology is necessary for them today doing their spelling, or whether they think, no, I'm just going to actually write my words out in code. Or do I need to say it and hear it. So it's their decision".

This illustrates the need for teachers to be given more control by schools and LAs as to the types of ICT their pupils are allowed to use in class. In some cases NQTs possessed the knowledge and expertise but needed to go to quite extreme lengths to resolve the issues which they felt should not have arisen. One NQT mentioned that:

"...I have brought my own laptop, simply because there were things that I was wanting to show them which were online, but they're blocked through the school firewalls. So I would bring my own laptop and use my BlackBerry as a modem to then get the files and just fiddle the wires so I could get it through the projector. So I mean that in itself is a huge issue. ... There are sites obviously you understand why they are blocked, but there are some sites you think well, why is this an issue? There's nothing there that's harmful and actually it would be really useful in the classroom".

Such comments illustrate that not all e-pedagogues for inclusion are made easily to implement. It is important that all teachers are supported both inside and outside school in terms of digital inclusion in order that they are able to deliver inclusive practices.

All the NQTs, in spite of receiving teacher education in inclusion, had conflicting views about retaining pupils in the classroom. One NQT mentioned that:

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"there are quite a few [pupils] that get taken out the class… they go out for reading, which I think is okay ... you know, they get to listen and they get one to one time, which I think is quite good to bring them on. I don't like them going out the class for maths".

Another NQT mentioned that:

"[Pupil X], he's one of the children from the unit. And he loves ICT. And he really doesn't like going out to do his reading, but he has to go. That's just the time that they're allocated. But with him particularly it's such a shame it just engages him. If I wanted him to go and sit in class and do a place value exercise I'd get nowhere".

This illustrates that NQTs' views towards inclusion can vary between different subjects. Only one of the NQTs mentioned using ICT more effectively to improve pupils reading whilst remaining in the classroom. She suggested that:

"And I think that's the great thing about English as a subject; we can use anything as a stimulus, you can take anything and you can use that, so you can cater more to their interests, and our outcomes are much more skilled based than knowledge based as they might be in the sciences".

This illustrates that some NQTs do, nevertheless, feel that pupils' reading and literacy difficulties can be addressed in the classroom by using ICT and inclusive practices.

Mixed-ability grouping forms a central part of inclusive practice. In all of the cases, pupils were either placed in mixed-ability pairs or small groups. One NQT mentioned that:

"They were very specifically paired. They were mixed ability pairings which is what we do most of the time. I don't tend to pair up the children from the unit together because I don't see that there are really any indications where that's necessary, unless they're doing a completely different piece of work and that very rarely happens".

The findings illustrate that mixed-ability grouping was a strategy which was being used by all of the NQTs regardless of whether they were using ICT or not. However, the effectiveness of the strategy seemed to depend on the relationship built between the individuals. One NQT mentioned that:

"They were all paired with, not necessarily the most able, so there wasn't a huge gap, but certainly it's quite hard to - with [Pupil X] for example, I paired him with a really quiet boy because I know [he] loves technology, and gave [him] kind of an opportunity to be in charge and be the leader. I could have paired him with other children who would be more able on a computer and he would have taken a back seat straight away, because he would have just thought 'oh I'll let them do it'. But it was good; sometimes it's good for the children in the unit to be the leader and the other children to follow. The girl with the blonde hair who was with [Pupil Y], she's very able, but she's also a really nice girl. So she would let him - he can be quite forceful, but she would let him take the lead a bit. Because there's no point having mixed ability groups if they just sit and watch the person do it. That's what happens sometimes as well, and you think well that's not serving anybody's best interests really".

This illustrates that in terms of ICT it also seemed to depend on whether the pupils were able to develop a sense of co-agency between each other when using the limited ICT resources. Having pupils sit around a computer can still result in one pupil being excluded particularly if s/he is made to feel different to the others and not made to feel they belong.

Whilst teaching pupils about ICT is important, it is also necessary that teachers also model ICT best practice. One NQT mentioned that:

"I think ICT, it's about getting them familiar with it, because we live in such a computerised world now, and there's much of that comes through modelling the use as just giving it to them and letting them get on with it. And I think it's really good for the relationships you build too... I know about MP3s and I can talk about the music that they like and what films are out on DVD, and so it builds all that relationship. And then they can teach me ... have you seen this, or have you tried this website?"

This illustrates the need for teachers to be seen by pupils as a respected and valued member of the learning community. Such relationships should also where possible be extended to parents.

E-pedagogies for inclusion have a place in NQTs' professional development. For example, all the NQTs have used GLOW as part of their professional development during their ITE, but did not use it much in their teaching. One NQT mentioned that:

"In school, no we haven't. A friend of mine teaches P3s over in Methlick, and a while we go we'd said oh we'll have to do a GLOW meet between my class and hers. But it's unreliability thing, because you put an awful lot of planning into it and then come the day you switch it on. So we're both kind of like oh no, we'll not bother. And it's a shame because it's good. I mean even the blogging we've had, a friend of mine works in the Cayman Islands teaching, so we've had a message from the Pirates of the Caribbean which is her class in the Caymans. Which they thought was 'oh a message from the Caribbean'. So that's how it should be working and that's what Glow should be like. There should be collaboration and contact. But I'm just finding it all a bit unreliable".

This illustrates the extent to which it is still very early days for GLOW in spite of all the NQTs seeing such great potential using the system. One NQT mentioned that:

"The other side of GLOW which I use quite a lot is I've a five year old son who attends Primary, this year they're piloting parental access. So I have my own GLOW account as a teacher, and then I have my parent's account, and it lets me go in. And with a kid in primary one it's really, really, really worthwhile, because I've gone from having him in nursery where I get daily feedback and what he's done and what he's had to eat, to he's in school and you get one parent's night and one report card, and that's it... You say to a five year old at the end of the day, 'what did you do at school today?' 'I can't remember, I don't know. I played in the playground.' Whereas what they're doing every week the teacher's posting up, 'this is our weekly routine, this is what we're going to be doing, here's a little bit of feedback on what we did last week.' So I've been able to track what he's doing there. So GLOW's been a big part of my life this year as a parent, but not so much as a teacher. But I think once the infrastructure's sorted out, because the kids as well, they say it's really slow and it's really clunky".

When e-pedagogies for inclusion are implemented in this way, it shows that ICT can open up not just further opportunities for all pupils to be included within a classroom situation but also to participate inclusively outside of school. It is however important that ICT is able to be reliably and seamlessly implemented into inclusive practices.

Overall, each NQT interviewed felt that their approach was inclusive and that the ITE course helped to prepare them for inclusion. However, they acknowledged that since inclusive practice is a process there are always areas which can be improved. The modified framework for participation presented in this work outlined areas where the NQTs needed to place greater attention when reflecting on their inclusive practice.

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Discussion

Having given an overview of the case studies, the remainder of this section discusses the findings in terms of research questions presented at the start of this report.

- To what extent are NQTs aware of the impact e-pedagogies can have on inclusive practices?

In each of the case studies, NQTs seemed very aware of inclusive practices and that using ICT had a central role to play in improving inclusion within the classroom. The NQTs all felt that by using ICT, it enhanced inclusion. A key reason for this was due to the core part of the NQT's pre-service course being centred on inclusive education and practice. The course provided them with a framework in which to reflect on their inclusive pedagogies. Whilst the NQTs were able to experience ICTs enhancing inclusion, such inclusive practices tended to be limited by access to ICT, as well as organisational and other barriers.

For example, in each of the cases, the NQT was not fully aware of the impact e-pedagogies can have on some aspects of inclusive practice in the classroom. Each NQT seemed to be aware that the way ICT is used in teaching could have an impact on pupils' access to learning and participation in the classroom, but were less aware of the impact it could have on pupils' achievement and belonging.

Decisions made by the NQT regarding inclusion tended not to be as a consequence of digital inclusion, but instead as one would expect, based on the NQT's perceived learning needs of the pupil. Consequently, the decisions tended to be focused on classroom activities. None of the NQTs considered the extent to which their pupils were digitally excluded outside school and whether their digital exclusion resulted in pupils being educationally excluded. The NQTs seemed to consider only pupils' ICT knowledge acquired and the ICT resources available for teaching. Such was the narrow focus it seemed to restrict the space and opportunities for developing co-agency, trust and working with and through others.

The NQTs conveyed little awareness of the impact that their use of e-pedagogies had on pupil's inclusion outside the classroom. In each case, the NQTs seemed to only focus on their pupils' inclusion within the classroom. Pupils' educational inclusion outside the classroom within the school and community did not seem to feature in the NQT's decisions.

Similarly, the NQTs tended to be less aware of the barriers to educational inclusion caused by digital exclusion, such as factors in their pupils' home and family life which resulted in barriers using digital technology for learning and, particularly, school work.

The NQTs were particularly unaware of the many barriers to learning within real world learning environments that are replicated in virtual learning environments. All the NQTs were unaware of the replication of such barriers in their VLEs and the full extent to which such barriers reinforced constraints in the traditional learning environments and inhibited learning opportunities, states of mind and resources when their pupils interacted with the VLEs. The inclusive decisions made by NQTs whilst seemingly addressing exclusion barriers in the classroom, often overlooked the barriers

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present in the schools' VLE. This tended to result in pupils being present in the classroom but isolated when using ICT.

- To what extent is ICT considered and used in inclusive pedagogies by NQTs?

ICT tended to be considered and where appropriate used in inclusive pedagogies by NQTs. Such decisions to use ICT tended to be based on enhancing curriculum accessibility and collaborative learning. NQTs' decisions tended not to consider whether the ICT facilitated recognition and acceptance of pupils' diversity. Learning achievements tended to reflect traditional educational abilities as opposed to including broader abilities which many pupils with additional support needs possess; particularly when using ICT.
Interestingly, all NQTs viewed ICT as a tool for teaching and learning. In terms of inclusion they viewed ICT as a tool for improving access to the curriculum. None of the NQTs considered ICT as an object or media for improving recognition and acceptance of children. The NQTs did not distinguish between e-pedagogies for inclusion and inclusive pedagogies. In each case, NQTs saw themselves as already using ICT in their inclusive pedagogies.

Many of the inclusive messages and views of ICT tended to be conveyed by the NQT to the pupils. Consequently, the children tended not to be aware of the inclusive affordances which ICT communicated, such as providing equal access time to use ICT, and recognising, accepting and respecting others in virtual environments.

In each of the cases, the NQT did not seem to consider the full range of affordances conveyed by ICT particularly in terms of Virtual Learning Environments (VLEs) and Computer Mediated Communications (CMCs). This resulted in many of the e-pedagogies used being centred on conventional teaching methods.

The NQTs tended to consider and use specific ICT for some or most of their pupils. They either used it to support individual pupils with ASNs or with most of the pupils whilst the pupils with ASNs received further learning support outside the classroom. Such decisions by the NQTs to use ICT for most or some pupils as opposed to all pupils could be perceived to be exclusive in nature.

- What are the barriers preventing NQTs from using e-pedagogies for inclusion?

In many of the case studies the main barriers preventing NQTs from effectively using e-pedagogies for inclusion included: issues of connection, confidence, continuity and capacity; issues of trust and working with and through others; and issues of ICT affordances. There were also organisational issues outlined in policies and strategies, and geographical and structural limitations which can be particularly difficult to change.

- To what extent is the use of e-pedagogies for inclusion by NQT's improved when based on an approach to develop e-pedagogies for inclusion?

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Early indications showed that NQTs use of e-pedagogies for inclusion improved. Previously all the NQTs had not experienced reflecting on their e-pedagogies for inclusion.

The approach enabled NQTs to consider inclusion from a broader perspective which included barriers afforded by virtual learning environments, CMCs and ICT used outside schools.

The approach also provided a framework that enhanced the way NQTs reflected on their inclusive practices and conveyed and shared their experiences with other practitioners.

It particularly raised awareness and concerns about how NQTs are affected by digital exclusion and the impact that has on their inclusive practices and inevitably their pupils.

Implications and Recommendations

Findings from the study showed that:

- This approach enhanced the extent to which e-pedagogies for inclusion can be studied.
- The NQTs surveyed were unaware of the main external and internal forces associated with exclusive barriers afforded by ICT.
- NQTs' e-pedagogies for inclusion were narrowly centred on ICT accessibility to curriculum content to support pupils with learning needs within the classroom.
- This approach enhanced NQTs ability to reflect and share knowledge and understanding of e-pedagogies for inclusion.
- A common characteristic of the e-pedagogies for inclusion used by the NQTs was the replication of exclusive barriers from traditional learning environments to virtual learning environments.
- The decision by NQTs to use ICT for most or some pupils as opposed to all pupils impacts on educational inclusion and that new approaches are needed which allow all children to use and share their own ICT alongside the school's ICT resources for learning both inside and outside school .

In terms of e-pedagogies, there were fewer strategies used by the NQTs which developed the belonging element of the participation framework. Many more strategies were used by the NQTs which focused on the access element of the framework. For example, in each of the case studies great consideration was given by NQTs to ensure that all the pupils with additional support needs were able to access the learning materials in class. Less attention was given to develop all the pupils' recognition and acceptance of diversity when using ICT for learning. Pupils with additional support needs were rarely placed in responsible roles where they are able to develop respect and trust from their peers.

Where ICT was used by pupils, there was a greater presence of co-agency and trust, than there was working with and through others. In many of the cases, NQTs relinquished full power and control

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and empowered pupils to take responsibility for their learning. The e-pedagogies used often involved entrusting the pupils with the NQT's own ICT. Less evident was the NQT's 'use of e-pedagogies when co-teaching or working with and through others.

Whilst all of the e-pedagogies used by the NQTs ensured pupils were able to access the curriculum in the classroom, little attention was given to allow pupils access to the materials outside school. Since all pupils were unable to access the materials outside school, it was often decided not to make the materials available remotely at all. Overall, the NQTs had little understanding of the digital barriers their pupils experienced both inside and outside school.

Educational inclusion featured extensively in the NQTs' planning. However, many aspects of digital inclusion were often overlooked. Consequently, many of the e-pedagogies adopted tended to use ICT as an inclusive tool for access and collaboration. Only one of the case studies featured ICT in the form of a media for inclusion. Such a role was predominantly left to the teacher.

Studies of digital exclusion have shown that exclusion is temporal and relative in nature and that the decisions and strategies implemented to address digital exclusion can result in individuals experiencing deeper forms of inclusion/exclusion (Yu, 2006). With e-pedagogies for inclusion, the temporal and relative nature of digital exclusion becomes an element of educational inclusion. Digital exclusion can not only inhibit the effectiveness of decisions made by teachers but in extreme cases, can result in inclusive strategies resulting in exclusion.

The study supports the view that teachers' decisions and strategies relating to implementing and using ICT can be productive or counterproductive in terms of educational inclusion. Whilst this study did not address the issue, it is also speculated that teachers' decisions and strategies relating to educational inclusion can be productive or counterproductive in terms of digital inclusion. Figure 1 below illustrates the interrelationship between educational and digital inclusion/exclusion. It is therefore important that teachers develop an awareness of digital exclusion and how it can impact of inclusive education within their learning communities.

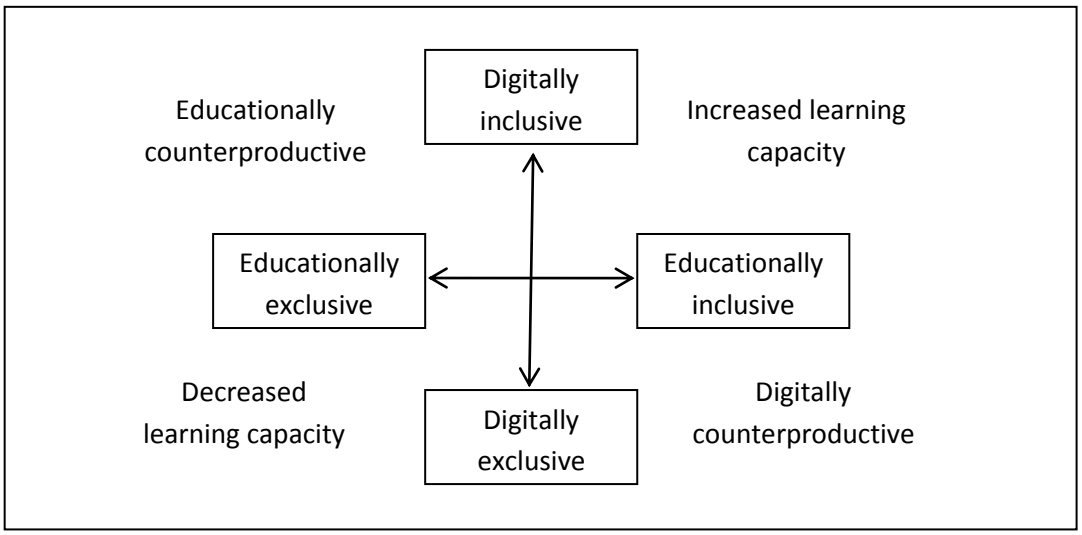

Figure 1: productive and counterproductive nature of educational and digital exclusion.

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Studies of teachers 'views towards educational inclusion have shown to affect their practices in inclusion (Hopkinson, 2005; Jones, 2006; Lambe & Bones, 2008; Sharma et al, 2008). Similarly, studies of teachers 'views towards ICT have shown to affect their use of ICT in their pedagogies and practices (Loveless et al, 2001; Wang, 2008; Hammond et al, 2009; Teo et al, 2009). The study supports the evidence that teachers' views towards ICT and views towards inclusion can have an impact on e-pedagogies for inclusion. It is therefore important that teachers develop their preparedness for inclusion using e-pedagogies.

Recent studies suggest that schools can be educationally inclusive and improve learning achievement (Black-Hawkins et al, 2007). The findings from this study support this evidence particularly if the decisions and strategies implemented using ICT complement those made for inclusion. As pupils' learning achievements involve the need for greater ICT activities which depend on greater understanding of e-skills, e-literacy and media literacy, such changes will inevitably impact on education inclusion.

Evidence exists indicating that pupils who are digitally excluded are also more likely to be educationally excluded (Bradbrook & Fisher, 2004). If digital exclusion is not fully considered and addressed by schools then there is a danger that there will be a gap open up between pupils and between teachers and staff.

E-pedagogies are by no means a panacea for inclusion. However, as ICT plays a greater role in education, it can be assumed that those who are digitally excluded will similarly be educationally excluded. This small pilot study has shown that NQTs narrow focus of e-pedagogies for inclusion will, if left to continue, inhibit pupils' learning potential and opportunities. More needs to be done to prepare NQTs for inclusion using e-pedagogies.

Implications for teacher education, NQTs, Schools and LAs

Whilst the findings from this pilot study need to be fully substantiated as part of a more substantial study, this section identifies and discusses the likely repercussions of these findings for NQTs, qualified practitioners, Local Authorities and the Scottish Government.

Since that the project was able to make the NQTs' more aware of the exclusive barriers caused by ICT when using e-pedagogies for inclusion, NQTs could face the dilemma of trying to take more care and attention when planning their teaching but limited to what they can actually achieve due to the limited ICT resources, as well as the knowledge and skills available within what can potentially be a difficult and changing working environment.

Since the project was able to obtain evidence of the exclusive and inclusive affordances of ICT when NQTs use e-pedagogies for inclusion, schools might usefully consider how best to share their ICT resources more inclusively.

Likewise, with the project able to obtain evidence of the exclusive and inclusive affordances of ICT when NQTs use e-pedagogies for inclusion, LAs could face the dilemma of how to enhance inclusion

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within their learning communities.

As shown from studies of digital exclusion, ICT is now a necessity both in education and in society as a whole. Better ways are needed to make ICT available in schools to those who need it and without it are likely to become excluded. Since most people have access to mobile technologies schools need to make more and better use of them. It is important that schools teach pupils how to use ICT responsibility for learning instead of banning ICT. School policies should open up the opportunity to exploit pupils' and teachers' own ICT given that it is a relatively inexpensive resource and then focus on using much of their ICT budgets on maintaining the ICT infrastructure and one-off purchases of larger forms of ICT equipment for specialized learning activities.

Instead of restricting and limiting access, the ICT systems NQTs and schools use need to become openly available to all and more transparent. That way when individuals misuse or abuse the ICT others are on hand to observe and address the situation. For example using the interactive whiteboard in a classroom as monitoring aid would allow all the pupils to use their own PSP to access the internet for learning. The whole class including the teacher could see what individual pupil's were doing. Teachers could implement e-pedagogies for inclusion centred on participation based on co-agency, trust and everyone. Such examples are based on technologies of today which would build on existing developments such as GLOW.

Recommendations for Teacher Education Schools, LAs, Government, ESCalate

The following are recommendations for consideration by Schools, LAs, Government and ESCalate. There is a need to:

- Conduct further research to substantiate findings.
- Investigate to what extent the pupils who are educationally excluded are also digitally excluded.
- Dispel teachers and schools negative views about using some forms of ICT such as mobile telephones in class and allow pupils greater opportunity to use and share their own ICT for learning in class.
- Provide all schools with improved ICT infrastructure to support wireless internet access.
- Better prepare teachers to be aware of, reflect and address the barriers to exclusive education caused through the use of ICT and the e-pedagogies they use.
- Further study the effect digital exclusion is having on schools and teachers in particular regions of the country.

Limitations of the study and lessons learnt

The study was formed as a small-scale exploration of e-pedagogies for inclusion. Consequently, this was the first time the modified framework for participation was used in a study. It involved NQTs

who had had specific teacher education in inclusion and were particularly supportive of inclusive principles and approaches.

Conclusions

This report sets out the need to study NQTs' e-pedagogies for inclusion by looking for examples of trust, co-agency and everyone using the modified framework for participation. The work, centred on an approach incorporating both educational and digital inclusion/exclusion barriers, such as outlined by the digital inclusion '5 Cs' framework and nature of using ICT, to show that NQTs' use of ICT can have both either a positive or negative impact on inclusive pedagogies, and particularly positive if NQTs' implement ICT for everybody not just most or some.

One of the key findings suggest that inclusive practices were less effective, when viewed both from a educational and digital exclusive perspective using the developed modified framework. Such research was intended to develop a clearer understanding of e-pedagogies for inclusion with the intention that, in the future, lessons from this work will be used to improve approaches to education inclusion research and initial teacher education.

This report stands to highlight the importance of e-pedagogies for inclusion which today lack consideration and research, and the need to continue improving teacher education in line with advancements in emerging digital technologies.

Schools with greater ICT resources will be able to address digital exclusion and if used effectively enhance education inclusion by allowing teachers to use e-pedagogies for inclusion wherever and whenever possible. Schools with poor ICT resources could exacerbate education exclusion by restricting pupils' potential and opportunities that can be enhanced via digital media.

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Abbreviations

ASN	Additional Support Needs
BEd4	Bachelor of Education (year 4)
CMC	Computer-Mediated Communication
E-pedagogy	Electronic pedagogy
EPP	Enhanced Professional Practice
HEA	Higher Education Academy
ICT	Information and Communication Technology
LA	Local Authority
MSC	Master of Science
NQT	Newly Qualified Teacher
PC	Personal Computer
PGDE	Postgraduate Diploma in Education
VLE	Virtual Learning Environment

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Appendices

Appendix A: Scoping Instrument

Appendix B: Modified Framework for Participation

Appendix C: Case Studies

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Appendix A: Scoping Instrument

E-Pedagogies for Inclusion Survey

Nigel Beacham (n.beacham@abdn.ac.uk)

This project explores how teachers use (or do not use) digital technology in their classrooms. This is sometimes called 'E-Pedagogy'. E-Pedagogy refers to the ways in which digital technology can be integrated into teaching and the learning experiences in the classroom (including the internet, digital cameras, mobile phones, interactive whiteboards, discussion boards, blogs, wikis, video conferencing, e-learning materials and assistive technologies such as AlphaSmarts and screen readers). The following questions aim to obtain information about the ways you use digital technology within your classroom and the impact digital technology can have on your *inclusive* practice.

The survey should not take more than 15 minutes to complete, however, please take all the time your need to complete it. All replies will be treated in the strictest confidence. Identification data will be used only by project staff to make contact with those who indicate that they are willing to take further part in the project.

If there is insufficient space available for your answers, further space is provided on the back page of the survey.

Part A: This section explores how you use digital technology in your classroom.

1. Do you use digital technology in classroom teaching? Yes ☐ No ☐

If you answered 'Yes' please go to question 2. If you answered 'No' please turn to question 7.

2. What types of digital technology are used in your classroom teaching?

3. What types of digital technology have you found most helpful in supporting learning?

PTO

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4. How have you used digital technology in your classroom? (*Please include examples.*)

5. Are you changing your practice to incorporate digital technology?

Yes ☐ No ☐

If '*Yes*' how have you changing your practice to incorporate digital technology?

Part B: This section explores your use of digital technology as an aide to inclusive practice.

6. Have you used digital technology with pupils with additional support needs? (*By additional support needs, we mean all pupils who are perceived to be having difficulties with learning and participation.*)

Yes ☐ No ☐

If '*Yes*' how have you used digital technology to include pupils with additional support needs in your classroom?

PTO

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7. What are the difficulties in using digital technologies in your classroom teaching?

8. Do you have any other comments about using digital technology to promote inclusive learning in your classroom?

Part C: This section requests your further involvement in the project.

Are you willing to take further part in the project by being involved in workshops and/or follow-up visits?

Yes ☐ No ☐

If you answered *'Yes'*, please provide the following contact details:

Name: _____

Email: _____

Telephone/ Mobile Number: _____

Name and address of school where you teach: _____

Thank you for your co-operation in completing this survey.

Survey created as part of the *Developing NQTs E-Pedagogies for Inclusion* project, in association with the Higher Education Academy Subject Centre ESCalate

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Please use the space below to continue answers if needed.

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Appendix B: Modified Framework for Participation

Framework for Participation in Classrooms/Schools/Communities using ICT

Table 1: Sections of the Framework for Participation using ICT in the Classroom/School/Community
1. Participation and **Access**: being there using ICT 2. Participation and **Collaboration**: learning together using ICT 3. Participation and **Achievement**: inclusive pedagogies using ICT 4. Participation and **Diversity**: recognition and acceptance using ICT

Table 2: Elements and questions of the Framework for Participation using ICT in the Classroom/School/Community
1.Participation and Access: being there using ICT • Joining the class/school/community o What ICT is used to enable a child to join part-time/full-time, frequent/infrequent? o What ICT is used which means a child is excluded part-time/full-time, frequent/infrequent? o What are the teaching strategies and practices involving ICT that promote (or reinforce barriers to) joining a class/school/community? o Why within the culture (values and beliefs) of the class/school/community is greater attention afforded to using ICT which enables some individuals/groups join? o Why is access to ICT withheld which would enable individuals/groups to join? • Staying in the class/school/community o What ICT is available to enable children to stay? And what ICT is available which means children are removed? o What are the teaching strategies and practices involving ICT that promote (or reinforce barriers regarding) staying in class/school/community? o Why within the culture (values and beliefs) of the class/school/community is greater attention afforded to using ICT which enables some individuals/groups stay? o Why is access to ICT withheld which would enable individuals/groups to stay? • Access to physical and virtual spaces and places inside the class/school and outside the school where ICT is available o What ICT is available/ not available for individual/group needs? o What ICT is available/ not available for the entire class/school needs? o What are the teaching strategies and practices involving ICT that promote (or reinforce barriers regarding) access to physical and virtual spaces and places? o Why within the culture (values and beliefs) of the class is greater access to the physical and virtual spaces and place using ICT afforded to some individuals/groups? o Why is access to the physical and virtual spaces and places using ICT withheld from some individuals/groups? • Access to the curriculum inside the class/school and outside the school community o Who is given/denied access to the curriculum using ICT and by whom/what? o What are the teaching strategies and practices using ICT that promote (or reinforce barriers regarding) access to the curriculum? o Why within the culture (values and beliefs) of the class is greater access to the curriculum using ICT afforded to some individuals/groups? And why is access to the curriculum using ICT withheld from some individuals/groups?
2. Participation and Collaboration: learning together using ICT • Children learning together in the class/school/community o Who learns together using ICT? And who does not learn together using ICT? o What are the teaching strategies and practices using ICT that promote (or reinforce

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barriers regarding) collaboration?
  - Why within the culture (values and beliefs) of the class is greater collaboration using ICT afforded to some individuals/groups? And why is collaboration using ICT withheld from some individuals/groups?
  - To what extent does ICT help children to build support networks within their communities?
  - To what extent does ICT give children a voice in constructing and negotiating their own contexts for learning
- Members of staff learning together in the class/school/community
- Members of staff learning with others from beyond the class
- Members of staff learning with children in the class/school/community

3. Participation and Achievement: inclusive pedagogies using ICT

- Members of staff knowing about inclusive pedagogies using ICT
- Members of staff using [or 'doing'] inclusive pedagogies using ICT
- Members of staff believing in inclusive pedagogies using ICT
  - Who achieves using ICT? And who does not achieve using ICT?
  - What are the teaching strategies and practices using ICT that promote (or reinforce barriers regarding) achievement for all?
  - Why within the culture (values and beliefs) of the class/school do some individuals/groups achieve using ICT?
  - Why are there barriers to the achievement of some individuals/groups when using ICT?
  - To what extent does ICT facilitate inclusive pedagogies within communities
- Children knowing about inclusive pedagogies using ICT
- Children using [or 'doing'] inclusive pedagogies using ICT
- Children believing in inclusive pedagogies using ICT

4. Participation and diversity: recognition and acceptance using ICT

- Recognition and acceptance of children, by staff
- Recognition and acceptance of staff, by staff
- Recognition and acceptance of children, by children
  - Who is/isn't recognised and accepted as a person and by whom? And
  - How does ICT aid/deny recognition and acceptance?
  - What are the teaching strategies and practices using ICT that promote (or form barriers regarding) recognition and acceptance?
  - Why within the culture (values and beliefs) of the class/school are some individuals/groups recognised and accepted using ICT? And why are there barriers to recognition and acceptance of some individuals/groups when using ICT?
  - To what extent does ICT help build social justice, empowerment, ownership and trust within communities?
  - The way that technology is used to recognise and address everyone's differences, including the needs and desires of minority groups, and the way in which it enables more people to communicate, socialise, join the debate and play a greater role in the development of society
- Recognition and acceptance of staff, by children

Adapted from Black-Hawkins, Florian and Rouse (2007) Achievement and Inclusion in Schools, Routledge, New York, USA.

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Appendix C

Case Studies

Appendix C contains four examples of teachers using e-pedagogies for inclusion.

	Case 1: BHS (Secondary)	Case 2: HS (Primary)	Case 3: MS (Primary)	Case 4: PS (Secondary)
Class size	14 S1s pupils	22 P5 pupils	28 P3s pupils	20 S1 pupils
E-pedagogy	Multimedia delivery	Research and development	Brainstorm and educational game	Media production

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Lesson observation 1: BHS

Classroom

The class consisted of 14 S1 pupils in a large city secondary school. In the class were three pupils with additional support needs described as writing and behavioural difficulties.

The classroom was not the NQTs own. The teacher only had a space in the common room opposite where there was a PC shared by other teachers.

The classroom contained 6 large tables each seating 4 pupils. At the start of the lesson pupils sat in groups of 2-4. One boy sat at a table on his own. This was because the other two boys he normally sat with were not at school that day.

Also present was a support tutor whose main role was to help those pupils in the classroom who experienced learning difficulties. They were not assigned to an individual but instead on hand to assist any pupil who asked for help.

Technology

The classroom contained a PC at the front connected to an interactive whiteboard (smartboard), and two PCs on a long shelf at the side of the room. The teacher mentioned that all the computers were relative old and slow. All the PCs had access to the school's network and internet. The teacher also mentioned that there was very little space on the school's network to store her teaching materials so some teachers like her had brought their own hard-drive and USB memory stick. The NQT had also brought a digital camera into school to be able to capture images of her practice for her professional development portfolio.

The NQT was aware of GLOW and had used it for her own personal development as part of a GLOW meet event. Unfortunately, this was only possible at her home on her own PC because the technology in the school was deemed by her to be not suitable.

Learning activity

At the start of the lesson the NQT needed to connect her own hard drive to the PC. Having tried it last week she was hoping it would work. However, despite leaving amply time she ended up having to call for a technician to help her. The PC would not recognise the device and assign a logical drive to it. Whilst the technician tried to solve the problem the NQT plugged in her USB stick and opened a file with part of the materials on. Whilst she waited for the technician, the NQT used the flipchart to draw a grid containing the information on supportive environments. She then asked the pupils to give examples of items which might be contained in the table. The pupils' answers were then entered into the table under the relevant column heading. Towards the end of this part of the lesson

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the support teacher also added a few items. Fortunately, after a few minutes the technician got the PC working so the NQT was able to access her hard drive.

The NQT was then able to show a number of photos which had been taken of the pupils learning during a previous lesson. The teacher posed the following two questions and then invited the pupils to say whether they thought the photos showed a supportive environment or not, and why, using the table shown on the flipchart.

- What evidence is there of a supportive environment?
- What evidence is there of people being 'on task'?

The photos shown included two boys working together, one boy using an Alphasmart on his own, and two girls working together. The teacher and pupils discussed why the boy with the Alphasmart was not seen as learning within a supportive environment despite being given access to assistive technology.

The entire activity focused on the IWB with lots of opportunities for pupils to interact, engage and participate.

Throughout the activity the teacher reminded that the main learning objective was for every pupil to contribute to the discussion. The NQT was aware that one of the tables at the back contained three boys who were not participating and contributing to the discussion. Towards the end of the session the support tutor went across to try and encourage them to participate. By the end of the session only one of the three boys on the table had actually participated.

The boy who was shown in the photo with the Alphasmart received several verbal warnings throughout the lesson. He was one of the most talkative pupils in the class. When he was also shown in one of the videos he became embarrassed.

Another video showed two girls working together. The NQT encouraged pupils to think about supportive environments in terms of what they look like, sound like and feel like.

One video was shown of a boy named Freddie. At this point, the class groaned. There was no praise or words of encouragement by pupils. It seemed this pupil was regularly 'picked on' because he was perceived as boring/clever.

When asked by the NQT if the pupils felt they were in a supportive environment, they all agreed.

Towards the end the NQT mentioned about the new teacher they were to receive next year, as she was leaving after her probationary period.

The boy who had been shown with the Alphasmart asked about his grade. The NQT explained that she was not required to grade the pupils so had not assigned grades. She also acknowledged that there were pupils of different abilities and levels and that everybody has their own strengths and weaknesses.

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Inclusive practice

From the NQT's perspective the session was based on inclusive practice. She not only tried to put into practice principles and strategies of inclusion but also explained to the pupils the concept of inclusion and supportive environments.

On seeing the lone boy sitting by himself, the NQT asked him to move to the table in front and join three other boys. The other boys found this fine and did not rebuff the boy sitting at their table.

The pupils did seem to be allowed to sit where they wished. This tended to be in small groups containing friends who they associated with. Girls tended to sit with girls and boys with boys.

One of the limitations to inclusive practice was that the photos and videos only showed friends together helping each other. It did not encourage boys and girls to work together or all pupils of different abilities to work together.

There seemed also to be a lot of peer-pressure in the class. Pupils seemed to only help each other if it was acceptable to others. This situation was evident both within the class (physical learning environment) and the electronic contents (virtual learning environment).

Final thoughts

The way in which the technology was used did add to pupils most being included. However, in this case the way the technology was used seemed to favour girls learning rather than boys. The girls were able to collaborate and express their feeling about supportive environments.

With the e-pedagogy being teacher-led this did seem to limit the extent to which the technology was able to be used for inclusion. Greater inclusion could have been achieved if the pupils were entrusted to use the technology themselves and given the space to use it.

It was interesting to see that the only example shown where ICT was used reflected a case of a not so good supportive environment. The NQT was very good it explaining to pupils the ways in which the technology supported learning but at the same time how it could be seem to exclude the pupil.

It is important teachers first focus on inclusive pedagogies and then on if and how technology can be used to enhance it.

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Lesson observation 2: HS

Classroom

The class consisted of 22 P5 pupils within a city primary school. The pupils were arranged in groups of three or four to each table.

The classroom was open plan onto a connecting corridor. This resulted in low-level noise from the other classes but nothing that was distractive. It consisted of seven tables arranged around the room. Around the walls was information for the pupils' learning and examples of the pupils' work. On one of the walls was a list containing who the pupils were paired with. The teacher tried to pair children according to who needed support and who was able to befriend them. Once paired, they could sit anywhere to work on the task together.

At the back of the room at one side were a small desk and a mobile bookcase with traditional learning resources on it.

At the back of the room opposite the bookcase was the teacher's desk and behind that a desk with two desktop computers.

Technology

The two desktop computers behind the teacher's desk were tucked away in one corner of the room. They were relatively new PCs only a year old containing Intel Core2 Duo processors and Windows Vista. Both PCs were RM computers with flat monitors and headsets. None of the headsets had microphones. Both PCs were networked to the school's virtual learning environment and provided access to printing facilities and the internet.

Both PCs were positioned on an unmoveable desk. Only the chairs were adjustable. There was room for two pupils to sit beside each other at each of the PCs, and there was also just enough room to accommodate about three further pupils standing behind if the teacher was not sitting at their desk.

Beside the PCs, on the wall in front of the class, was an interactive whiteboard (IWB - SmartBoard). The IWB was unable to be adjusted and was positioned quite high for many of the pupils to reach areas at the top.

Beside the two PCs was a laptop connected to a digital portable projector camera. The projector camera allowed the teacher to place objects under the camera and have them displayed on the IWB. This facility was totally down to the effort, knowledge and skill of the teacher. The teacher had taken it upon himself to search for unused ICT in the school and having found the camera was able to install it.

In addition, the teacher had setup four wireless laptops on a table in front of the entrance to the classroom. Each laptop allowed two/three pupils to sit around. These laptops were part of a central resource of 16 which are able to be reserved by any of the teachers in the school. At the time 12 of

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the laptops were being used by other teachers. Like the PCs, the laptops were also only about a year old, containing Intel Core2 Duo processors and Windows Vista. All were RM laptops providing remote access to the internet and the School's virtual learning environment for printing facilities. The laptops were battery powered and were extremely heavy.

Learning activity

The pupils had been given the task of creating an A4-sized poster on the topic of exercise as part of their mini project on health and science. They were given an example on a portable whiteboard positioned beside the IWB. The example was arranged into three sections. These sections represented warm up, main and warm down activities, and the pupils needed to provide two or three examples for each. There examples could be in the form of drawings or text.

With the limited number of computers the teacher allocated them to five pupils who were perceived to struggle with literacy. These pupils could use the laptops to print of images, cut them out and glue them on to their poster or use the laptop to create a poster completely. On the whole, many of selected pupils used the laptops themselves. It was difficult to ascertain whether the pupil's peer-support was sitting next to them with one of the other laptops or not. On the odd occasion when they needed help, the pupil next to them did provide them with assistance. The rest of the pupils used coloured pens and pencils to create their posters.

Later on in the session when many of the pupils using the laptops had obtained the printed images they needed, the teacher rotated the pupils on the laptops to give other pupils who were felt to need technology assistance. It was only at this stage it was observed two pupils using the same laptop together. One pupil with literacy difficulties was being supported by his assigned peer.

The teacher constantly went around the class observing the pupils progress. The teacher paid particular attention to the pupils working on the laptops. Less attention was paid to the boy with additional needs over on the PC behind the teacher's desk.

At the end of the session, the teacher finished with a game. The game involved appointing two pupils; one of the pupils to play the role of a lighthouse and one to play the role of a ship. The pupil playing the ship was blindfolded and the pupil playing the lighthouse was asked to sit somewhere in the classroom. The rest of the pupils played the role of rocks. The aim of the game was for the ship to steer towards the lighthouse by avoiding the rocks by listening for the lighthouse horn (made by the pupil playing the role of the lighthouse). Whenever the ship came near a rock pupil playing the role of the rock would make a sound of the waves hitting it. All the class enjoyed the game. It created a good sense of learning community. Interestingly, no ICT was used.

Right at the end the pupils were handed two pieces of paper to take home. These papers were for their parents and related to parents evening. It was interesting to note that technology was not being used to support or replace the activity.

Inclusive practice

Very early on in the session one boy was observed using a desktop on his own. The teacher mentioned that this pupil was one that needed additional support. He would normally be accompanied by a support tutor, but the tutor was away. Very few pupils were interacting with him. He did not seem to have peer support like the other pupils. He also did not seem to know what he was supposed to be doing, other than finding images on the PC. From time to time the boy would leave the PC and go over to other pupils to see what they were doing. At one point he repeatedly placed his hand on the camera to display it to the rest of the class. Most of the other pupils ignored him, so after a while he went back to looking for images on the PC.

Later on in the session a boy and girl used the other PC to look up images. The girl seemed to be having difficulty using the PC so the pupil with additional support needs helped her. Whilst the girl appreciated being helped she did not seem to show a close comradeship with the boy like she had with the boy who was her peer support.

At no point did the pupil with additional needs print any images, despite attempting to draw by hand some examples on his poster. It was clear that the other pupils using the laptops were trusted by the teacher to collect their print outs from the printer down the corridor.

When it came to the end of the session the teacher asked the pupils to check each other's work to ensure that there was the right number of examples shown before taking it to the teacher for marking. At this point the pupil with additional support became lost. In the end the pupil took it straight to the teacher.

Those pupils which were perceived to have produced the best posters had them placed under the camera and displayed to the whole class. Other pupils could then volunteer to have their posters displayed too. The pupil with additional support put his hand up to have his poster displayed but was not chosen by the teacher.

Whilst ICT played a central role in the teacher's inclusive pedagogy, there were occasions when ICT did not feature. At the end one girl asked if she could play a different game. The teacher agreed that if time they could. The girl was asked to collect three items in a bag and if time the class would be asked to guess what they were. Unfortunately for the girl, the class was having such a great time with the first game that there was no time to play her game at the end. She seemed to take it well and still enjoyed the first game. The way in which the teacher handled the situation seemed much more influenced by his understanding of inclusion than when situations arose which involved ICT.

Technical difficulties

At one point when the teacher was showing pupils work on the IWB, to make the pupils poster clearer the teacher turned off the lights. In doing so the IWB also went off. The teacher quickly rectified the problem by putting the lights back on and proceeded to make the pupils poster as clear as possible.

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Between rotating the pupils on the laptops, the computers had automatically logged out. Some of the pupils were unable to log on to the laptops but the teacher was on hand to help. With only four laptops this did not take much time.

Interestingly, when the teacher used the camera to display the pupils work, the teacher would place the work under the camera not the pupil. The teacher seemed to feel pupils would have difficulty doing this.

Closing thoughts

Technology was not seen as anything special. It was viewed as just part of the learning environment. However, there seemed to be very little interaction between those pupils on the computers and those pupils sitting at other tables.

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Lesson observation 3: MS

Classroom

The class consisted of 28 P3 pupils within a small village primary school. The classroom was open plan with an art area and another classroom adjoining. In the classroom were five large tables seating 6 pupils. One of the tables was able to seat eight.

Technology

In the classroom was the teacher's laptop connected to an interactive whiteboard (Smartboard). At the back of the classroom was a desktop. The desktop was an Intel Celeron D PC from RM with Windows XP installed. It had a set of headphones and a microphone connected. It also had access to the internet and the school's virtual learning environment.

The teacher mentioned that the school has a set of Nintendo DS devices which they use from time to time. The school also has a Nintendo Wii and a number of flip camcorders. Only four pupils at a time can use the Wiis so the teacher rotates the pupils from week to week to practice on the brain-training programme. Because the teacher is unable to supervise the use of the Wii a teaching assistant helps if they are available.

The school also has an ICT room containing a suite of 17 desktops. All the PCs are the same as the one at the back of the classroom. All except four PCs are arranged around the edge of the room. These four are located in the centre of the room, two either side of a large desk. One of the PCs nearest a large projector screen is connected to a data projector. There is also a coloured printer networked to the PCs. All the PCs have headphones but not microphones. At the back of the ICT room there is a RM Notebus containing a set of laptops which teachers can borrow.

Learning activity

The learning outcome of the session was for the pupils to create a word cloud on the theme of pirates. The teacher would then place the pupils' clouds on the school's blog for parents to see. The teacher was keen for parents to be as involved as possible. The teacher also was aware some pupils had parents working offshore, so placing pupils' work on the school blog helped to keep parents informed of their children's progress.

In the ICT room most of the pupils worked in pairs. Many of the pairs had been assigned by the teacher. Most pairing consisted of boys or girls. However there were four pairs which consisted of a boy and girl.

At the start of the session the teacher asked the pupils to log on and access the website on Wordle. The teacher asked the pupils to watch how to access to website and use the tool for creating word clouds. The teacher took the pupils through an example. The teacher showed them how to create a

cloud, how to put words in the cloud, how to make specific words appear larger and how to enter word phrases using the '~' symbol. The teacher then went on the show the pupils how to change the font, arrangement and colour of the text in their clouds using the custom pallet. The teacher then mentioned that s/he would be looking to see pupils taking turns and asked the pupils who needed help accessing the website. The teacher and the support tutor went around ensuring all the pupils were able to create their clouds.

Most of the pairs worked together. In some cases the pupils took turns using the PC. In other cases there was one pupil who carried out much of the PC interaction. In these pairs there tended to be one pupil who was more dominant and who took control of the PC. The less dominant pupil was then required to give verbal support if and when required. Interestingly, it was not always the boys who took control. Two of the four girls seemed to be particularly engaged.

Four pupils were then asked to leave to receive additional support on their numeracy and literacy. One of the boys to leave had literacy difficulties and the remaining boy and girls numeracy difficulties.

One of the girls working alone then took over control of the PC that was connected to the data projector and created her own cloud. The girl was eventually joined by a boy when the teacher asked if they would work together. When the pupils returned towards the end of the session one of the boys worked on their own supported by the teacher. The others rejoined their other peers.

The pairs were very well behaved with every pupil engaged in the task. The only minor infringement was when one of the boys started to annoy another but this did not last long.

All the pupils seemed to find creating the clouds easy. Towards the middle of the session the girl on the teachers PC ask if she could print out the cloud. When the girl printed off the cloud the boy with her was really pleased. At this point many of the other pupils turned around and joined the pair to look at what they had produced. The rest of the pupils then asked if they could print their clouds too. At one point there was quite a group standing around the printer waiting for their clouds. After each cloud was printed the group would inspect the work.

One pair of girls had difficulty printing out their cloud. The PC displayed the popup window but the printer failed to print. To save time the teacher moved the girls to one of the other PCs that were no longer being used because the pupils had left the room to receive additional support. When the girls who received support returned towards the end of the session the teacher split up the returning pair to work with two other pairs. The teacher did not ask one of the girls to work with any of the pupils working alone. The teacher took a screen capture of the cloud on the PC that would not print as evidence. The teacher also proceeded to save other pupils clouds so she could put them on the school blog.

For those pupils that had finished and printed out their clouds, they were able to choose whether to continue learning from Spell city or Topic box. All the pupils seemed to choose the dinosaur game from the Topic box.

Another technical problem occurred when two boys were playing the dinosaur game. The teacher had noticed that they only needed to find one more dinosaur and was interested to know what happen when all were found. Unfortunately, the PC went wrong and the pupils were required to

start again. The boys were really disappointed. One said “so not worth it!” Their disappointment was further deepened when a short time after one of the boy’s with additional support needs, working alone, managed to find all the dinosaurs. The teacher announcing it to the class asked the class to applaud the boy. The disappointed boy asked if they should get a clap for second. The teacher replied that you get nothing for second.

At the end of the session the teacher asked the pupils to log off and shutdown the PCs. The one boy that really got to use the PC asked the teacher if the PCs not used needed to be shutdown.

Having returned to the classroom, the teacher reminded the class that they were going to have the head teacher read to them.

The teacher then when on to tell two of the pupils in the class about the open day they had which they missed. The teacher spoke about the boats they had made and how they filmed the boats using flip cameras sailing across a tank. The teacher asked the two pupils to guest which of the boats was the fastest. The teacher also mentioned that if time tomorrow the two pupils would get chance to sail their own boat.

Inclusive practice

At the start of the session there were two girls and boys who each sat at a PC alone. Interestingly the teacher asked one of the boys and girls to join as a pair and work together. The other two were left to work alone. Interestingly, when the boy joined the girl it was the boy that took over the control of the PC.

There was one girl who preferred to work alone and one boy who receives additional support. This boy was called out of the class to receive additional support for literacy. There was also three other pupils in the class who were also removed to receive additional support for maths. The teacher mentioned that this is the only time which is convenient for such pupils to receive additional support. Throughout the session there was also a few other pupils taken out to receive additional support for maths.

There was also one boy who was from a minority culture. This pupil was paired with a girl. Throughout the session it was the girl who took control of the PC and the boy just sat and watched.

There was also one boy who never really got to use a PC. He sat back and gave verbal support to the girl throughout the session. The only time he did get a very short go was when the pair started to play one of the games after completing their cloud.

For the majority of the session the teacher assistant was helping support additional needs pupils outside the ICT room.

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Final thoughts

In many cases it was the boys that took over the PC; at least in the beginning. Many of the girls were perfectly capable. After a short period many of the boys become bored or were unsure what to do. At this point the girls take over and take control of the situation. This is one example where ICT can be seen to be disruptive. It is therefore important that effective inclusive practices extend to those situations which involve using ICT. In this case the boys were unaware of how their behaviour was restricting their peers' access to resources and affecting these peers capacity to learn. Furthermore, the pupils were engrossed in the learning task and paid little attention to how they were learning.

Adopting e-pedagogies for inclusion can only be effective if the e-pedagogy adopts inclusive principles. In this case the classroom activity centred on finding time for the pupils with ASNs to receive additional support. Unfortunately, the support involved the pupils receiving the additional support outside the classroom. Whilst the use of ICT can have an impact on pedagogy, this example has shown how inclusive pedagogy has impacted on the use of ICT. For some of the pupils, particularly those who received support in their assigned pairs, leaving the classroom seemed to have less of an impact on exclusive than those who went alone. Those pupils that were sat at a computer alone and who then left the room for support seem to find returning to the classroom more of a excluding experience.

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Lesson observation 4: PS

Classroom

The class consisted of 20 S1 pupils in a secondary school located within a small town. The pupils were perceived by the teacher as mixed ability ranging from level C to E, with most having transferred from primary with level D. The majority of the class were from white families. Only one pupil was from a minority group. There were two pupils that had recently joined the class toward the end of the first year.

The classroom was laid out in rows of desks 8x4. Most of the boys sat together and the girls also sat together.

Technology

Much of the school technology available to the teacher was relatively old. The teacher reported that there were still a number of Pentium II PCs still around the school.

In the classroom there was a single PC connected to a data projector hanging from the classroom ceiling. There was a pull-down screen over a green chalk board for projecting the images on. The PC was located on a desk at the front of the class and had speakers attached. The PC had Microsoft XP installed and was able to access both the internet and the share drives on the school's virtual learning environment. The teacher was also able to obtain a digital camcorder and a digital sound recording microphone. These were devices given to the school by the Learning and Teaching Scotland team for use with GLOW.

To supplement the school's technology the teacher had brought in her own mp3 player and laptop. Like the PC the laptop also had Windows XP installed. However, the laptop was not able to access the internet or the schools virtual learning environment. The mp3 player was her own personal device and the laptop was given to her for being part of an ongoing project. The teacher mentioned they could have borrowed a laptop from a portable trolley of laptops, but that they are often reserved by other teachers.

Learning activity

The learning objective was to develop a promotional video about the school for P5 pupils in their local primary schools. The video is intended to show P5 pupils what it is like at secondary school.

The teacher had divided the class into three groups. Group 1 contained 8 pupils who were responsible for creating the video. Group 2 contained 6 pupils who were responsible for the voice overlay for the video. Group 3 also contained 6 pupils who were responsible for creating the credits at the end of the video.

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The teacher apologised for not editing the video appended to the title clip the pupils had taken the session before. A pupil asked if they could do it in the lesson if there was time at the end; to which the teacher agreed.

Before they were sent away to continue with their assigned activities the teacher asked the pupils to decide which song they would like to play on the video as a backing track. The teacher asked a pupil sitting under the projector to switch it on. The teacher first played four songs whilst at the same time playing the title clip of the video; three which the pupils had suggested and one the teacher had obtained. This was intended to help the pupils visualise what the video would sound like with the song saved as the backing track. The teacher also tried to get the pupils to listen to the lyrics by commenting on the words in the track. This however did not seem to work. The pupils seemed focused on the music not the words. There was a fifth song but the teacher was unable to find a copy to play. The teacher did ask the pupils if they could sing it, but none offered. Throughout the songs there was one girl who placed her head on the desk. She might have been listening but she was unable to see what it sounded like overlaid on the video. A number of the boys became very excited and proceeded to jump out of their seats and dance around.

The teacher then used Word to display the names of the songs and the band that played them. The teacher then asked the pupils for their opinions as to the relevance and suitability (catchy/uplifting) of each song. The teacher entered the pupils' comments under each song title. In the main there were a number of pupils who dominated the feedback. The teacher did at one point ask one of the quieter pupils (a girl who was quiet spoken) to comment but this was met with shouts of objection. One boy did say that "everybody has their opinion", but this did not seem to make a real difference. There were some pupils who put up their hands but these were overlooked by pupils who just shouted out.

After the pupils had given comments on the fourth song, the teacher asked the pupils if they would prefer to choose which song would be used for the video using hands-up or by a secret ballet. The pupils chose the hands up method. The teacher asked the class to put up their hand for the song they thought would be used for the video. For each of the songs displayed on the screen, the teacher deleted the pupil's thoughts and replaced them with the number of pupils with their hands up. This did not go well. By the end of the vote, only 12 of the 20 had put their hands up. One pupil even asked if they could change their mind. Consequently, the teacher decided they would use the secret ballet method at the end of the session. The teacher then switched off of the projector and left the PC on for the pupils to use for creating their voice over.

Throughout the session the pupils were extremely excitable. The teacher would regularly warn the pupils to be quiet and to behave. Only on one occasion did the teacher ask one of the pupils to step outside the room for a minute. The teacher then went out and spoke to the pupil before allowing the pupil back into the room.

The start of the learning activity was teacher-led. However, once the songs had been played and discussed the teacher gave more control to the pupils. The teacher released each group to continue on with their assigned tasks. Group 1 left the classroom to finish filming the video. Groups 2 and 3 stayed in the classroom working on their tasks.

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After a while one of the pupils from the filming group returned with the camera saying that the batteries was dead. The teacher asked the pupil to go to the staff room and ask a member of staff to give them another camera.

The teacher tried to scaffold the task to help the group that were creating the voiceover by suggesting them write down what they plan to say before recording it. The teacher also positioned the video at the start time so the pupils could easily find it.

The teacher also helped the group creating the credits by asking them questions about what should be in the credits and how they should look on the video. The teacher asked one of the boys to lead the task as he had experience using PC. One of the girls mentioned that she too had experience but was ignored. Another girl at a desk behind where the boys were sat using the laptop said nothing and just looked left out. The boy selected to use the laptop realised the girl was being left out and pickup the laptop and placed it on her desk. He then turned around and continued to use the laptop so she could see what he was doing.

The teacher then turned her attention to see how the group creating the voice over were doing. One of the boys had possession of the digital microphone but was unable to get it to work. He called on others in his group but still they could not get it to work. The boy asked for help but was not keen on giving up control of the device. He wanted the others in the group just to explain how it worked. In the end the teacher explained to him how the microphone worked. In the meantime the girls in the group were writing down a script on paper whilst using the PC to view the video. This was one of the few times to girls got to take over the PC. When the girls had finished the teacher told the group to go to another room where it was quiet to record the script. The teacher then went with them to get them started.

After a short while the teacher returned to see how the group creating the credits were progressing. The group had not progressed very far so the teacher repeated the instructions what they needed to do. One of the pupils came up with a funny credit describing one of the pupils (Chief chatterbox). This was a sign of inspiration for the rest. They then continued trying to come up with funny credits for the rest of the class. One of the girls was writing down the credits on paper. One of the boys asked the teacher whether there was a way to enter the credits straight onto the video. The teacher explained that the tool was unable to do that. The boy then asked if they could use notepad or Microsoft Word to write the credits. The teacher thought this was a good idea and thought it would make merging the credits easier.

One of the girls asked about the teacher's mp3 player if she could listen to the songs on the player. The teacher explained that she thought the iPod was over-rated for the money and that was why she had an mp3 player. The teacher agreed to give the mp3 player to the girl but unfortunately one of the boys got hold of the device first and would not give up the device until he had proceeded to view every song on it. This infuriated the girl. The girl and boy proceeded to argue until the boy had finished with the device. When the boy had finished he handed the device to the girl but the girl then complained that she did not get the device when she wanted it. While this was happening the teacher was asking the pupils on the laptop to think about what colours and fonts to use for the credits.

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When the group returned from creating the voiceover it was unclear who had produced the voiceover.

Not long after the group recording the film returned and the teacher asked for the equipment back and for the laptop to be turned off. It was left to one of the girls to switch of the computer.

The teacher then mentioned about creating a cover for the DVD next time. One of the boys suggested it should be homework but others in the class disagreed. One pupil asked if they were able to print covers out in colour. The teacher explained that this was not going to be possible because of printing costs.

Finally, the teacher handed out pieces of paper and asked the pupils to write the name of the song they wanted the video to play. After collecting in the pieces of paper and countering the votes the teacher announced the song which was to be used. Whilst the majority of the class approved, there were some in the class who disapproved. However, all of the class were happy to except the decision in the end.

Inclusive practice

Throughout the session the teacher gave the pupils space to participate. This space placed an important part in developing the learning community. For example when the boy using the laptop recognised the girl behind was being excluded from the task so he moved the laptop to her desk and proceeded to use it so she could see what he was doing. The girl showed her appreciation and from then on played a central role in helping to produce the credits with the boy.

Two of the pupils were new to the class. One girl seemed to have fitted in fine, but there were concerns about the boy. The boy complained about being excluded but when the class tried to involve him he did not engage. The boy mentioned that he finds school boring. He does not like using technologies and would prefer to play on his bike with his friends at home. He enjoys cooking and is interested in engineering and plumbing.

Final thoughts

Interestingly, the boys often tended to take over the technology and the girls were left to do the work using often pen and paper. The boys were the first to take over the PC and digital microphone until it actually came to create the voiceover. It was left to the girls to script the material. In the case of the credits the boys took control of the laptop until it came to the point of writing what should go into the credits.

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Further details about this report and the project can be obtained by contacting:

Dr Nigel Beacham

School of Education

University of Aberdeen

Aberdeen, Scotland, UK

Email: n.beacham@abdn.ac.uk

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