Introducing Mobile Technology
A handbook for all schools in Northern Ireland
How to use this Handbook

Schools across Northern Ireland have been contacting the Creative Learning Centres seeking advice, training and solutions on how best to deploy and integrate mobile devices in their classrooms.

This handbook is designed to provide guidance to school leaders hoping to introduce mobile devices in primary or post-primary schools and to support them in making informed, well balanced choices.

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INTRODUCTION

CONTEXT

The creative use of technology in our classrooms has been an exciting development, presenting schools and school leaders with both opportunities and challenges for learning. The pace of change reflects the unprecedented revolution in the use of technology in wider society and continues to challenge our education system and our policy makers.

The CLCs work with a range of schools and are funded by DCAL. These schools are a mix of grant-aided schools and all grant-aided schools. The CLCs work in close collaboration with teachers, leaders and other organisations in our community. They are an innovative and dynamic network of learning organisations and venues that offer an integrated programme of support and training for all organisations involved with young people.

THE CREATIVE LEARNING CENTRES

The Creative Learning Centres (CLCs) presently operate from the Nerve Centre in Derry~Londonderry, the AmMA Centre in Armagh and Studio ON in Belfast. Funded by DCAL and managed by NI Screen, the CLCs work together to offer an integrated programme of support and training in digital literacy and the creative use of media and technology for the education and youth/community sectors. The remit of the CLCs is to work with young people, teachers and leaders throughout these sectors.

CREATIVITY AND DIGITAL LITERACY

Creativity is a process that has been described as the capacity in all people to combine skills, knowledge and resources to solve problems in new ways in any context and within any group. (DCAL, 2000)1. Creative learning involves an active, structured approach and relies on the application of acquired knowledge, the mastering of materials and techniques and the organisation of ideas. It is not a separate capacity that some young people have and others lack. Creative learning can take place in all areas of activity including the arts, sciences, work, play and other social environments. It encourages innovation by connecting ideas not previously connected.

Digital literacy

Digital literacy is the ability to access, understand and create communications in a variety of contexts using digital technology. Young people receive their ideas, stories, information and entertainment not only from books and other printed forms of media, but also from television, films, DVDs and increasingly from the internet and mobile devices.

In order to become valued citizens who contribute and participate fully in society and the workplace, our young people need the skills to actively understand, criticise and use these media in creative ways, rather than just passively consuming them. This digital literacy should be a basic entitlement for every child in every school in Northern Ireland.

1 DCAL, Unlocking Creativity: A Strategy for Development, 2000, p 15

"On 1st April 2012, the new C2k Education Network contract came into place which will deliver the next generation of education technology services to all grant-aided schools across Northern Ireland. The new service has been designed to recognise and facilitate the changing nature of technology, including the use of personal smart mobile devices and tablet computers, alongside the specific educational requirements of Northern Ireland’s schools.”

"Although print literacy is immensely important, it is no longer enough to ensure young people’s full participation in the culture, social life and politics of the 21st century.”

A Wider Literacy (NIFTC/BFI, 2004)
1.0 : INTRODUCTION

FUTURE CLASSROOMS

WHY MOBILE?

Mobile devices are increasingly growing in popularity in the home and at work. According to recent research, 39% of 2-4 year olds have used a smart device, while a Cisco report says the number of smartphones, tablets, laptops and internet-capable phones will exceed the number of humans in 2013.

Research by the British Educational Suppliers Association (BESA) concluded that at least 6% of desktop/laptop computers in schools would be tablets by the end of 2012 (4.5 per cent in primary, 6.9 per cent in secondary), with this rising to 22% by the end of 2015.

New tablet computers and smart phones are offering the opportunity to access a wealth of resources and information that can support pupil led learning and a variety of learning styles. However, it is the access to inbuilt cameras and microphones, as well as an ever-growing list of "power apps" that makes these devices really exciting. Mobile devices are no longer just for consuming media, they allow you to document, edit and create. This means pupils can demonstrate their knowledge and understanding in any area of the curriculum through creative means.

Add this to the long battery life, quick boot time, wireless capabilities and portability and you have a device that can also facilitate anytime learning, group work and collaboration both within and outside class and between pupils, teachers and parents.

Marking their books wouldn’t empower me to know exactly what their understanding is, whereas them talking about it is a lot better way to assess what their understanding is. Traditionally, you just mark their books; now we get much more powerful evidence of how they’re actually learning and what they are thinking as well. That’s a real plus that the iPads have brought.

Teacher, Honywood Community Science School

7 Apps that offer similar capabilities to desktop software.

Case Study

Kilronan School, Magherafelt

Touch devices are also revolutionising the lives of children and adults with additional needs. For people lacking motor skills touch screens are more intuitive as there is no mouse, keyboard or pen intercepting their communication with the screen. There are an estimated 40,000 plus apps developed for this demographic and devices are now being used as an alternative to very expensive touch-to-speak technology and for other accessibility purposes for those with physical and/or learning disabilities.

Lisa Brown, teacher/ICT Co-ordinator at Kilronan School, outlines how mobile technologies have impacted on teaching and learning in the classroom.

"As a teacher of pupils with severe and profound learning difficulties, the use of mobile technologies has transformed the way many of our pupils learn and indeed how we teach. For many pupils with physical difficulties, iPads have provided opportunities to explore and engage with curriculum activities, which would not have been physically possible when presented on an Interactive White Board (IWB) or laptop. Mobile technologies are user friendly in terms of their ease of use.

From our youngest pupils who enjoy simple early years apps on the iPad at our 'mums and tots' (age 1-3 years) to one of our oldest pupils who takes his iPod on work experience to help him communicate and record his experiences during the day.

We feel this is such an exciting time for our pupils and staff alike and cannot wait to see what else we can do with our mobile devices! It has opened up so many possibilities for our very special pupils on the Autistic Spectrum, those with communication difficulties and those with profound difficulties."
When planning to introduce mobile technology, schools should be aware that they may still need to support and/or invest in machines capable of higher end computer processing. This is especially applicable for post-primary schools offering subjects at GCSE and A-Level such as Moving Image Arts, Technology and ICT. It is also advisable to have dedicated machines to manage school owned mobile devices. (please see section 2.7 for more detail).

It is important to remember that existing technology and equipment can and still should be a key part of schools’ ICT Strategy. The Creative Learning Centres therefore continue to provide comprehensive teacher training and partnership programmes dedicated to creative teaching and learning through PC and Mac software.

A recent report on using 1:1 Android devices with 5th Graders concluded: “We believe that 21st century students need personal AND ready access to high quality, responsive desktops and laptops, but that if we have to choose between them, always-on, always connected personal mobile devices provide the greater advantage.”

**DESKTOP VS MOBILE**

Although mobile devices have come a long way in the short space of time they have been available, there are still some areas that desktop computers/laptops are currently better suited for, (e.g. extended essay writing, advanced audio and video editing and use of other specialist software).

### Mobile device
- Instant on
- Portable
- Longer battery life
- Built in cameras, video and microphones
- Touch enabled, engaging content
- A wealth of free and low cost apps
- Wireless capabilities

### Desktop /laptop
- Smaller screen size
- Less storage
- Not as powerful for production or typing on screen
- Not all existing resources and websites will work
- Management and configuration issues

**Desktop /laptop**
- Longer boot time
- Less portable
- Do not usually have built in cameras, microphones or video capabilities
- Software usually more expensive
- More storage and more processing power
- Larger screen and full keyboard
- Existing resources and websites can be used
- Can be easier to manage file sharing and storage

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**PLAN**

What needs to be considered before I introduce mobile technology to my school?

**KNOW YOUR STARTING POINT**

Before new technology is introduced, it is vital that a school evaluates the success of its current ICT provision. If current technology is not being used successfully, then it is unlikely that new technology will be used to its full potential without some significant changes within the school. A readiness assessment will provide a starting point and help to build a strategic path of where you want your school to be.

**What is technology being used for?**

Recent criticism of ICT provision in schools has mostly been centred on the argument that teaching children how to word process and create spreadsheets is not enough to equip them for a changing economy where a mix of creative and technical skills is increasingly important.

The development of “Using ICT” as a cross curricular skill within the Northern Ireland Curriculum attempts to address this by including new areas such as moving image and animation, design, game making, 3D modeling and programming into the statutory assessment. Schools need to evaluate how well they are integrating ICT into all areas of the curriculum and their effectiveness at delivering a well-balanced programme that will develop digital literacy as well as engage and inspire pupils.

**ESTABLISH A STRONG VISION AND CLEAR ICT STRATEGY**

It is vital that any rollout of new technology is guided by a clear vision. This should:

- Be a key part of the School Development Plan and should be drawn from the curriculum rather than the technology
- Consider and develop current e-Learning and ICT strategies
- Provide a plan for exploiting existing equipment and introducing new technologies
- Clarify ways in which new and existing technologies will improve pupil learning
- Be future proofed enough to be applicable to any new technologies that may be introduced over the coming years
- Provide purpose and direction, and guide future decision making
- Be shared with teachers, pupils, parents, governors and other stakeholders

The Department of Education’s key policy “Every School a Good School” focuses on improving the outcomes for all pupils and in particular pupil attainment in literacy and numeracy. Any technology led approach should underpin this strategy and should also focus on increasing the following pupil centred goals:

- Digital understanding, skills and literacies
- Personalised learning - support of a variety of learning styles and abilities
- Independence and self-initiated learning
- Access to quality digital resources (including eBooks, PDFs, videos, podcasts, apps etc.)
- Access to a broad range of software/apps for organising, documenting, exploring and creating
- Access to collaborative learning tools (e.g. VLEs, shared documents, blogs etc.)
- Digital showcasing of pupils work
- Extending learning beyond the classroom

“In a world that is becoming increasingly reliant on technology, young people need to be given the opportunity to learn ICT skills in an interesting, challenging and relevant way. Schools should provide a range of ICT courses that are suitably matched to students’ needs, support them with their learning and prepare them for higher education and for skilled work in a technological age.”

“Young people have huge appetites for the computing devices they use outside of school. Yet ICT and Computer Science in school seem to turn these young people off. We need school curricula to engage them better if the next generation are to engineer technology and not just consume it.”

Professor Matthew Harrison, Director of Education at The Royal Academy of Engineering

FUTURE CLASSROOMS

2.0 PLAN

EVALUATE CURRENT ICT SUPPORT AND FORM A PROJECT TEAM

When considering the introduction of mobile technology, schools need to evaluate whether there is adequate technical support within the school. If your school is considering a shared set of mobile devices then it will be important to have skilled and enthusiastic staff in place to setup, manage and maintain the devices.

Often, current ICT coordinators/staff may be unfamiliar with the deployment and management of mobile technology and may require training and guidance. Most ICT technicians will be skilled in managing PC systems but may find devices such as Apple iPads beyond their experience. Investment in training for these staff will be vital to the success of your school’s mobile device rollout.

Extra training and time out of teaching will almost certainly be required at the beginning of a mobile device rollout, and continued investment in training will be vital to the success of your school’s long-term ICT strategy. The Creative Learning Centres have built up considerable knowledge and experience in this area and are offering a variety of training and support, including twilight teacher training and partnership programmes for schools.

Considerations:

• Who will form my project team?
• Is there someone within the team with enough passion, seniority and time to act as a driving force to push the rollout forward?
• Does your existing ICT Coordinator or e-Learning Coordinator have the knowledge and skills required to effectively manage the rollout of mobile technology?
• Do they require time out for training and support?
• Can I free up these coordinators to give them time to design and implement the new ICT Strategy?
• Are there teachers within the school who could work with the project team and mentor other teachers in the embedding of technology in the classroom?
• Is there enough technical support to deal with the setup, management and technical issues that may arise?
• Do they need advice and training on mobile devices?
• If extra support staff will be required, have I revisited job descriptions and updated them for the proposed technology and infrastructure? (You may consider including curriculum development and staff training as part of the responsibilities)

Case Study

Bangor Central Integrated Primary School, Bangor, Co. Down

After a partnership with Studio ON Creative Learning Centre, Bangor Central has gone on to develop a clear and effective ICT Strategy as part of their School Development Plan. They have recently invested in a shared set of iPads for their P1, P4 and P7 classes. Their ICT Coordinator, Marian Murray sets out an outline of how they have planned for the use of technology in the school.

"Firstly, I met with each year group to find out what the year group topics were. In year 3 – 7, we have chosen a range of suitable CCEA UCT tasks to link usefully with topics. Long-term learning intentions were written for each year group ensuring progression. Most lessons on the long term ICT planners are taught in the computer suite but we also use iPads in the classroom to link with learning intentions, particularly literacy and numeracy, to teach topic work and to develop the creative use of ICT across the curriculum.

Each teacher from year 1 – 7 researches suitable apps that help achieve or reinforce their learning intentions. Every Monday morning each year group write up their app of the week and details of what the app is used for. Apps are then written into weekly planners. I then collect in planners every six weeks to monitor and evaluate what each year group are teaching in ICT and to ensure that every year group are following the ICT learning intentions from the long term planners and to ensure that apps are linked to learning intentions."
FUTURE CLASSROOMS

2.0 PLAN

DESIGN AN ICT INFRASTRUCTURE DEVELOPMENT PLAN

Wireless connectivity

Although mobile devices do not necessarily need wireless connectivity to work, access to a wireless network greatly enhances the potential of the devices. For example, local wireless access will allow devices to connect to projectors/whiteboards/computers and other devices whilst internet connectivity can allow instant access to information during class and may be required for certain apps.

Schools should be aware that ideally each classroom would have wireless access with appropriate bandwidths to cope with the demands of the numbers of tablet (and other wireless) devices deployed in the school accessing the network simultaneously.

Until the full C2k solution is available to schools a temporary solution may be to use wireless routers to provide connectivity (but not internet access). Thus devices will be able to connect to one another and also to take advantage of wirelessly sharing mobile screens through a data projector.

C2k wireless provision:

“As part of the C2k Education Network contract, C2k will be providing all schools with a number of wireless access points (WAPs). Post-primary schools will receive 1 WAP for every 30 students; primary schools will receive 1 WAP for every 50 students. In addition there is an allocation of 1 WAP for every 30 staff. Schools will have to decide how best these should be deployed to provide the best wireless access for the school. C2k has published advice for schools on how to optimise their wireless signal range in terms of the placement and installation of wireless access points. The design and construction of school buildings may also affect the wireless range so an element of experimentation may be required to achieve the optimum coverage.”

Considerations for alternative internet provision

If alternative wireless internet provision is invested in it is important to refer to the DE Circular 2011/12.

Storage and file sharing

Another infrastructural consideration will be the sharing and storage of files created on mobile devices. As most tablets and phones are designed to be personal wireless devices, it can be challenging for schools to integrate them into existing network and storage solutions. For example, iOS devices do not allow more than one user account and therefore if the devices are to be shared there may be considerable time spent managing the backup and deletion of pupil and teacher work and the deployment and removal of different apps for different purposes.

One way of managing this is through cloud-based storage systems where pupils and teachers upload and store their work in a “cloud”, or online storage area that also allows file sharing and collaboration. Examples of these are Google Docs, Skydrive, Dropbox, and the school’s VLE. Both Google Docs and SkyDrive are accessible through the C2K network and provide free storage and file sharing.

The new C2K service will provide a custom cloud based system that will work in combination with the school’s VLE. However, it is important to confirm that files are accessible on the mobile device in use.

This section outlines several options for rolling out mobile devices in your school. It begins by looking at the pros and cons of four options: bring your own device (BYOD), teacher only, shared set of devices and 1:1. It then suggests three possible ownership models: personal ownership, layered ownership and institutional ownership.

**BYOD**

**PROS**
- Can work well for teacher and pupil organisation and productivity (i.e. note-taking, access to email, calendar, resources etc.)
- Can help to encourage self-management and responsibility
- Can extend school resources – teachers and pupils can make use of the built-in cameras for photos and videos and various apps for content creation etc.
- Can allow teachers to focus on content/pedagogy while the pupils manage their own devices and solve their own technical issues

**CONS/CONSIDERATIONS**
- A mixture of devices and operating systems can be difficult to manage in terms of internet access and user settings/restrictions
- File formats can vary and cause problems when teachers and/or pupils are collaborating on work
- It may be difficult to ensure all the devices have similar key apps for content creation (for example for word processing, creating presentations, creating videos, editing images etc.)
- Is it the responsibility of the school or teachers/pupils/parents to buy these apps?
- If the teacher and pupils own the devices, how do you implement fair usage and content policies and draw the line between home and school use?
- Possible security issues when devices are not in use

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*For the purposes of the rest of this document we will be not be discussing BYOD as a rollout model. The difficulty in managing multiple device systems, combined with finding appropriate apps that allow for powerful content creation and are available across all devices means BYOD cannot presently offer a solution that adequately facilitates pupil learning, creativity and digital literacy. However, the CLCs do believe that allowing pupils and teachers to bring their own devices into school, combined with access to other computing devices for content creation, can work well for certain scenarios such as pupil productivity and self-management or for augmenting equipment in the classroom.*

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**Teachers only**

**PROS**
- Good starting point for piloting mobile devices in school
- Teachers can gain confidence using the technology in the classroom
- Teachers can share experiences and ideas
- May be great for teachers creating and sharing resources such as interactive presentations and displaying interesting and engaging content through subject specific apps

**CONS/CONSIDERATIONS**
- Pupils have limited or no access to explore and create on the devices
- Do teachers or the school buy the devices?
- Do teachers or the school buy apps?
- If teachers buy their own devices how does the school manage personal use (e.g. access to email, use of photos etc.)?
- There are also potential security concerns, for example issues with access to personal data, including emails if the device is left unattended or shared with a student. (However, this could be the case with all models)
Shared set of devices

**PROS**
- This method may be used as the next step after the teacher only model, where each teacher has a device and as confidence grows they can bring a shared set of devices into their class for pupils to use
- The school can manage the devices and have complete control over them
- Pupils have access to devices to explore topics and build their learning
- Possible to focus the use of the technology on specific areas such as numeracy and literacy
- Could be used on a project basis for cross-curricular work and as part of the implementation of Using ICT
- May be a good way of evaluating the impact on pupils and preparing for a larger rollout

**CONS/CONSIDERATIONS**
- Not all pupils can have access at the same time – how will this be managed?
- How do you ensure fair access throughout the school?
- May be difficult to share devices that are designed to be personal and do not allow multiple user accounts
- Will require time and personnel to manage the devices – e.g. charging, syncing, updating, backing up work, moving the devices around the school
- Will require secure storage areas when not in use
- Will pupils be allowed to take them home on some occasions? How will this be managed?
- Clear policies need to be in place for acceptable use and eSafety
- May need to lock down the devices to ensure a consistent user experience from class to class and student to student.

1:1 devices

**PROS**
- Equal access for everyone
- Whole school is using the same devices which can be setup and managed the same way
- If parents pay or contribute can relieve the school budget
- Pupils take the devices home and are responsible for them therefore:
  - May relieve some of the pressure on technical support in terms of storing, charging and syncing
  - Gives pupils ownership of their device so they are more likely to look after it
  - May help pupils’ self-management skills and motivation
  - May extend school learning

**CONS/CONSIDERATIONS**
- May be a significant financial commitment for the school to purchase the devices
- If parents are expected to buy or rent the devices what happens if some parents are not able to afford it, opt out or have several children at the school?
- If the device is purchased by parents who buys apps - the school or parents?
- What happens if a device is damaged, lost or stolen?
- Clear policies need to be in place for acceptable use
- How will the devices be setup and managed? How much will they be restricted?
OSWERSHIP MODELS
(Who owns and manages the devices?)

Apple’s support materials refer to 3 different models of deployment for iOS devices within an enterprise or educational institution. These models are applicable, in principle, to the deployment and management of any mobile device within an educational environment:

1: Personal ownership model
From an institutional point of view, this is the most ‘hands-off’ approach to dealing with mobile devices. It deals less with the ownership of the device and more with the ownership of data on the devices.

1. Institution may or may not initially configure the device
2. Institution assigns the device to a user
3. User opts in to acceptable use policy
4. User manages their own content and apps
5. User opts in to cloud based services as required
6. User avails of school cloud and IT services
7. Institution can ‘gift’ apps or content to users as required
8. Institution or the user can own the actual device (BYOD)

2: Institutional ownership model
In this scenario, the institution takes full ownership of the device and is responsible for all services, configuration and content.

1. Institution configures all the devices to requirement
2. Institution manages the purchase and download of resources and apps
3. User can’t purchase apps and must request them from the institution
4. Institution controls access to the devices and what they can be used for
5. Institution can opt into volume purchase agreements to get better value on apps.
6. Centralised computers or an enterprise solution will be used for syncing, updating and backup
7. Suited to deployment of ‘shared sets’ of devices or in 1:1 deployments where the institution wishes to retain control

3: Layered ownership model
A combination of the previous scenarios. Initial setup is taken care of by the institution but the device becomes the users responsibility.

1. Initial setup and configuration by institution
2. Some apps and content are preloaded on the device by the institution
3. User can add to the preloaded content using their own store accounts
4. User can opt into external cloud-based services for personal backup and restore under their own details
5. Sync stations can be used which allow users to connect by cable for backup, restore and updates.

Each scenario has its own merits but ultimately it comes down to how much control the institution wants to relinquish to its users. Regardless of the approach that is taken, vigilance is required from a security and acceptable use perspective so it is essential to ensure you have the correct preventative measures and user policies in place.


Choose mobile devices

Whilst technology continues to change, the process of identifying the best solution should remain the same. In considering what is best, you must take time to explore the various solutions available and consider these in relation to your specific needs and requirements. These may vary from school to school depending on the deployment scenario but there are some key considerations that apply to all.

Considerations:

- Which device offers the best overall value per unit?
- Can the device support and offer enough processing power to deal with apps that allow higher end content editing and creation? For example, Photoshop Touch for Android (a powerful app for photo editing), requires a tablet running Android 3.1 or higher and at least a 8.9 inch display with a minimum resolution of 1280x800.
- Is the device compatible with existing network infrastructure including the school’s virtual learning environment (VLE)?
- What additional infrastructure is needed to integrate these devices?
- What is the realistic lifespan of the device? (Manufacturers tend to drop support within 2 to 3 years of it reaching end of production at which point software updates become a problem and the device rapidly becomes obsolete. An example of this is the original iPad which was discontinued in April 2011 with support dropped just over a year later with the release of iOS 6 in June 2012).
- Is the device a scalable solution?
- Is the device compatible with existing learning resources?
- What warranty options are there if required?
Mobile device platforms

**IOS KEY FACTS:**

- Originally launched as an operating system for the iPhone. iOS is proprietary software for Apple touch screen devices. The current version is iOS 6.1.
- All of the iPads offered by Apple are sold with the same iOS version and a very similar feature list.
- The software is exclusive to Apple devices and is considered a closed system with apps and content delivered via integrated online stores including the App Store, iTunes Store and iBook Store.
- They have instant access to iTunes U and iBook Store which offer high quality educational resources but all these services rely on Wi-Fi or 3G access.
- A key strength of the iPad range has been its battery life which lasts up to 10 hours of active use and much longer with standby mode.
- All devices have front and rear cameras
- They have a closed file system and depend on the cloud or a computer for sharing data. (The iCloud ecosystem is designed to work with all Apple devices and computers).
- There are no SD card slots or USB ports which again presents challenges when sharing data but this also makes the device more secure.
- An SD card adapter is available but only for transferring photos and video clips.
- With 4.2% of the tablet market, the iPad has a comfortable lead although it does offer some competition from Android.
- Prices start from around £329*.

<table>
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<tr>
<th>iPad Mini</th>
<th>iPad 2</th>
<th>iPod Touch</th>
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<tbody>
<tr>
<td>7.8&quot; retina screen (1,024 x 768 pixels)</td>
<td>9.7&quot; retina screen (2,048 x 1,536 pixels)</td>
<td>7&quot; retina screen (1,136 x 640 pixels)</td>
</tr>
<tr>
<td>10 hours battery life**</td>
<td>10 hours battery life**</td>
<td>8 hours battery life**</td>
</tr>
<tr>
<td>A5 (1GHz) processor, 1GB RAM</td>
<td>A5X (1.4GHz) processor, 1GB RAM</td>
<td>1GHz processor</td>
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<tr>
<td>1MP front camera</td>
<td>1.2MP front camera</td>
<td>1 GHz processor</td>
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<tr>
<td>800p HD video recording</td>
<td>800p HD video recording</td>
<td>1080p HD video recording</td>
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<td>Built in microphone</td>
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<td>16GB, 32GB, or 64GB storage (cannot be expanded)</td>
<td>16GB, 32GB, or 64GB storage (cannot be expanded)</td>
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<td>Prices start from around £299*</td>
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This new model is the most expensive but does offer superior power and features such as the retina display and front and rear cameras.

The iPod touch has had similar success in education but as it has been on the market for over two years it may be likely to be discontinued in the near future. There are also storage limitations with this device.

**ANDROID KEY FACTS:**

- An open source operating system built on Linux for touch screen devices including phones, cameras and tablets.
- It was acquired by Google in 2005 and is offered as free, open source software to hardware manufacturers like Samsung, HTC, Sony and other major technology manufacturers all over the world.
- Current version is 4.2 known as ‘Jelly Bean’.
- As a result, it is used in hundreds of products holding 75% of the smartphone market.
- Apps are delivered via the Google Play store. Android enjoys 75% of the world smartphone market across a huge range of devices.
- Hardware features will vary from one product to another but some of the more popular tablets on the market provide a good measure of the standard available.
- From an educational perspective, the smaller screen and the lack of rear facing camera may be a disadvantage. Whilst it has a front facing camera, it has no integrated Camera app and the video quality is fairly low.

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<tr>
<th>Samsung Galaxy Note 10</th>
<th>Google Nexus 10</th>
<th>Google Nexus 7</th>
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<tbody>
<tr>
<td>10.1&quot; retina screen (2,048 x 1,536 pixels)</td>
<td>10.1&quot; retina screen (2,048 x 1,536 pixels)</td>
<td>7&quot; screen (1,280 x 800 pixels)</td>
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<tr>
<td>3DMP front camera</td>
<td>5MP rear camera</td>
<td>9 hour battery life**</td>
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<tr>
<td>720p HD video recording</td>
<td>720p HD video recording</td>
<td>1.2GHz processor, 1GB RAM</td>
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<tr>
<td>Built in microphone</td>
<td>Built in microphone</td>
<td>1.4GHz processor, 1GB RAM</td>
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<tr>
<td>Ships with a stylus</td>
<td>Ships with a stylus</td>
<td>1.3GHz processor, 1GB RAM</td>
</tr>
<tr>
<td>No built in app for video recording</td>
<td>No built in app for video recording</td>
<td>VCA video recording</td>
</tr>
<tr>
<td>16GB or 32GB storage (can be expanded with SD cards)</td>
<td>16GB or 32GB storage (can be expanded with SD cards)</td>
<td>Prices start from around £199*</td>
</tr>
</tbody>
</table>

Manufactured by Samsung, branded by Google

Manufactured by Asus, branded by Google

*Prices are only a guide and do not take into account educational discount that may be available through some suppliers.

**Battery life is dependent on the type of usage and may be lower for video playback etc.
**Battery life is dependent on the type of usage and may be lower for video playback etc.**

*Prices are only a guide and do not take into account educational discount that may be available through some suppliers.

Before any deployment is considered, a number of key legal implications that should be thoroughly researched and monitored and controlled. Also, access to app stores and marketplaces have legal restrictions, forbidding children under a certain age to access them. There are a number of key legal implications that should be thoroughly researched before any deployment is considered.

### WINDOWS RT KEY FACTS:

- Windows RT launched in late 2012 alongside Windows RT for mobile, touch screen devices
- Windows RT is released under license with companies like Asus, Acer, Samsung, Nokia, and Dell selling products with Windows RT installed on them.
- Microsoft have also made the decision to launch their own brand of tablet devices called Surface which have become synonymous with the ‘Live Tile’ interface.
- Some consumer confusion exists regarding the difference between Windows 8 and Windows RT with the lines between tablet devices and similar laptops and notebooks becoming less clear.

### Microsoft Surface RT

- 10.6” screen (1,366 x 768 pixels)
- 8 hour battery life**
- 1.3GHz processor, 2GB RAM
- 720p rear camera
- 720p front camera
- 720p HD video recording
- Built in microphone
- Comes with Vapor Mg case (built in hard and optional touch cover keyboard)
- 32 or 64GB storage (can be expanded with SD cards)
- Prices start from around £420*

Unlike other tablets on the market, it also has a full size USB port. The metro interface looks familiar to Windows 8 but it will not run traditional Windows applications. Apps are available from the Windows store but are limited at present. Battery life is excellent but performance is susceptible to lagging in comparison to other tablets with similar processing power.

### ASUS Vivo Tab RT

- 10.1” screen (1,366 x 768 pixels)
- 9 hour battery life**
- 1.3GHz processor, 2GB RAM
- 8MP rear camera
- 7MP front camera
- 1080p HD video recording
- Built in microphone
- 32 or 64GB storage (can be expanded with SD cards)
- Prices start from around £495*

This tablet offers good specifications but the price point is also a limiting factor.

### Acer Iconia W700

- 11.6” screen (1,920 x 1,080 pixels)
- 1.7GHz processor, 4GB RAM
- 5MP rear camera
- 1.3MP front camera
- 1080p HD video recording
- Built in microphone
- Includes stand and keyboard
- 32 or 64GB storage (can be expanded with SD cards)
- Prices start from around £659*

Due to launch in February 2013.

### Microsoft Surface Pro

- 10.6” screen (1,920 x 1,080 pixels)
- Intel core i5 processor, 4GB RAM
- 720p rear camera
- 720p front camera
- 720p HD video recording
- Built in microphone
- 64GB or 128GB storage
- Stylus included
- Prices start from around £750* for a 64GB model

The surface pro will offer Windows 8 Professional on a tablet device, allowing users to run full applications as opposed to apps along with all the tools and utilities of a full spec pc or laptop. However, it is worth noting that only 256GB is left on the 64GB model after the install of Windows 8 Pro.

**What are the social and legal implications of these tablet devices?**

Many of these devices are primarily consumer-based solutions, and thus have close integration with online merchandising and social networking applications that may not be appropriate for use in schools. For example, the Kindle Fire sells below cost and therefore critics have suggested that the push of the device is to sell the consumer Amazon products. Schools need to ask themselves if this is appropriate in a school setting and how it could be monitored and controlled. Also, access to app stores and marketplaces have legal restrictions, forbidding children under a certain age to access them. There are a number of key legal implications that should be thoroughly researched before any deployment is considered.

### PROTECTING YOUR DEVICE:

#### Cases

A practical, quality case for each mobile device is essential as it will prevent breakage and minimise wear and tear. Cheaper cases tend not to last so a purchase in the £20 - £30 price range is advisable. In choosing a case ensure there is a protective lip that surrounds the screen, as this will ensure the glass does not come into contact with the ground if dropped. Most cases come with magnetic front covers that put the device into power save mode when closed over.

The Snugg Case is a leather full body case for iPad which also acts as a stand. It has a hand strap and has magnets that activate power saving when the screen cover is closed. This is a durable, affordable product that is highly recommended for school use. Griffin Survivor Cases also come highly recommended but are slightly more expensive.

#### Syncing carts and cases

Depending on your school’s rollout model, you may want to consider investing in device carts or cases for storing, charging and syncing purposes.

Carts can be useful for moving shared sets of devices from room to room and keeping them secure. Larger carts can also sync and charge up to 32 devices at a time and this can be useful if devices are to be stored in school and shared among pupils and classes. Large carts can go up to over £5,000 and can be quite unwieldy.

Cases are a smaller solution that allow for mobility, secure storage, charging and syncing of up to 16 devices at a time. Some cases also provide housing for other hardware such as a laptop, Apple TV and WiFi hub, which can provide a good solution for managing smaller sets of shared devices. Cases range from around £1,000 to £2,000 depending on how many devices they hold.

#### Screen protectors

Many schools purchase screen protectors for their devices at a cost of £2 - £3 each. The protectors are clear plastic sheets that are stuck to the screen. Whilst they offer protection with regards to scratching or marking, it is worth noting that most mobile devices use Corning Gorilla Glass which is extremely hard-wearing and scratch resistant. Screen protectors tend to bubble and collect dirt around the edges.

*Prices are only a guide and do not take into account educational discount that may be available through some suppliers.

**Battery life is dependent on the type of usage and may be lower for video playback etc."
Extended warranty

These are purchased at the discretion of each school. Devices usually come with a standard 1-year ‘limited’ warranty covering defects as a result of faulty parts or manufacturing process. Extended Warranty will usually extend this warranty by 2 years. Whilst this offer some peace of mind, it is worth noting that damage resulting from accident, misuse, abuse or neglect is not covered. It is also worth noting that tablets are devoid of moving or mechanical parts which are most prone to failure. AppleCare+ for iPad can cost upwards of £49 per device.

Insurance schemes

These can be availed of for large 1:1 deployments. Users can also source their own insurance. These schemes will cover a device against accidental damage or theft.

OTHER POSSIBLE COSTS

Stylus

The majority of tablet devices do not require a stylus but they can still be of benefit when working with certain apps, particularly handwriting or art apps. A stylus provides more precise control and tends not to obscure what you are doing on screen. They can be purchased online for as little as £2.

Laptop or desktop for managing

Management of iOS devices is gradually moving towards the cloud but some tasks still require the use of a computer. iTunes 11 on Mac or PC will provide the same user experience but will not run on Windows XP. A computer can also be used to collect and distribute work that has been completed on the devices and a Mac will also allow you to create iBooks for the devices.

Printing

Wireless printers designed to work with iOS devices are available but a number of low cost alternatives exist that will avoid of existing printers in your school. For example, ‘Handy Print’ or ‘Fingerprint’ software can be installed on a computer that has access to a printer turning it into a wireless print server for iOS devices. Fingerprint costs around £15 and Handyprint is free but Mac only.

App purchase

Different approaches can be taken in purchasing and deploying apps. For iOS, using iTunes gift cards allows you to preload an iTunes account with credit in £15, £25 or £50 multiples. This credit can then be used to download apps, content and iBooks to your devices. Apps can range from free to over £50 for some of the specialist apps for additional needs, although most are a couple of pounds.

Volume purchasing programme

Apple also use this program for managing app purchasing for larger deployments. Working with your Apple reseller, codes are assigned for each license of any purchased app. Using Apple Configurator or other third party software, the codes allow you to install that app on a set number of devices. Buying through VPP may allow you to avail of bulk discounts.

PROJECTING IPADS

You can buy an AV adaptor lead for the iPad for around £29 that allows you to connect to a projector or Interactive Whiteboard. However, a real benefit of the iPad for the classroom is wireless screen mirroring. iPads use Apple Airplay technology that allows a user to wirelessly mirror their iPad screen to a larger display. The following are two options to be considered but please note that both require wireless access.

Screen display software

There is software available for Mac or PC that allows you to display your device screen on a projector or whiteboard connected to the computer. An example of this is Reflector that allows Apple Airplay to connect to the software installed on the computer and then displays the iPad screen. A license for Reflector costs around £9 (although multi-license discounts are available).

Apple TV

This is a device that connects by HDMI allowing you to stream video and sound to any connected display or projector. Apple TV costs around £80. A HDMI to VGA converter may be needed to connect to your classroom projector. This costs around £20-30

<table>
<thead>
<tr>
<th>ITEM</th>
<th>APPROX. COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leba Sync Case (Holds and syncs 16 iPads)</td>
<td>£1325.00</td>
</tr>
<tr>
<td>Lock N Charge 32-Bay IQ Cart for iPad</td>
<td>£2416.00</td>
</tr>
<tr>
<td>Mac Computer for Managing iPads - entry level Macbook Air 11&quot; i5 Dual Core</td>
<td>£590.00</td>
</tr>
<tr>
<td>Mac Computer for Managing iPads - more powerful Macbook Pro 13&quot; i5 Dual Core</td>
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<tr>
<td>Apple TV</td>
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<tr>
<td>Kanex ATV Pro (Apple TV to VGA Converter)</td>
<td>£29.00</td>
</tr>
<tr>
<td>Apple Express WiFi hub</td>
<td>£59.00</td>
</tr>
<tr>
<td>Reflector software (for PC/Mac)</td>
<td>£9.00</td>
</tr>
<tr>
<td>Griffin Survivor Case for iPad</td>
<td>£45.00</td>
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<td>Snugg Case for iPad</td>
<td>£25.00</td>
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<tr>
<td>Tecknet FolioCase for iPad Mini</td>
<td>£20.00</td>
</tr>
<tr>
<td>COLT HQ Stylus Pen (4 pack)</td>
<td>£3.99</td>
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<tr>
<td>Fingerprint software (for PC/Mac)</td>
<td>£15.00</td>
</tr>
<tr>
<td>Extended Warrantly for iPad (2 + 1 year)</td>
<td>£52.00</td>
</tr>
<tr>
<td>iPad AV adaptor</td>
<td>£29.00</td>
</tr>
<tr>
<td>Spare iPad power lead</td>
<td>£12.00</td>
</tr>
<tr>
<td>iTunes Cards</td>
<td>£15, £25 or £50 units</td>
</tr>
</tbody>
</table>

* Prices are a guide only and include educational discount where available. Please contact ELB Purchasing for current procurement details.
2.8

DEVELOP A PROJECT PLAN & TIMELINE

It may be useful to create a timeline with key milestones to manage the implementation of mobile devices within the school. The following may help you to plan your rollout.

1

PLAN - What needs to be considered before I introduce mobile technology to my school?

- Establish a strong vision and clear ICT strategy and communicate to stakeholders
- Evaluate current ICT support and form a project team
- Evaluate current ICT infrastructure and design a development plan if required
- Decide a rollout model
- Choose mobile devices
- Calculate the costs
- Revisit current e-Safety policies and update for mobile devices

2

PREPARE & SUPPORT -
What are the first steps in preparing my school for mobile learning?

- Setup devices with initial settings and agreed restrictions
- Distribute devices to teachers
- Provide initial teacher training
- Allow teachers time to experiment with their device (ideally over a school holiday)
- Design a procedure for teachers to recommend and request apps
- Provide training on specific apps if required
- Coordinate teams of teachers to work on incorporating technology into their existing schemes of work and develop new teaching plans
- Evaluate how well teachers are integrating mobile technology into their everyday teaching
- Develop support documentation and resources
- Prepare responses to anticipated questions & prepare a communication strategy.
- Organise parents information sessions
- Encourage ongoing parental involvement

3

DEPLOY - How do I implement a mobile classroom?

- Consider how mobile devices might change classroom practice
- Timetable access to shared sets of devices
- Distribute devices to be used by pupils
- Provide pupil induction, including acceptable use etc.

4

MONITOR & EVALUATE -
How do I know mobile learning is making a difference?

- Baseline pupils
- Implement monitoring systems
- Plan to sustain and develop meaningful access to technology
2.9

REVISIT CURRENT E-SAFETY POLICIES AND UPDATE FOR MOBILE DEVICES

If your school already has an ICT acceptable use policy and/or e-Safety and mobile phone policy in place, it is important to review this in light of the introduction of mobile technology. Although it may be helpful to take direction from policies used in other schools remember that any policy should be tailored to your school’s ICT vision and overall ethos.

Depending on the rollout model chosen, you may need to decide how much devices themselves should be restricted and how much should be down to individual pupil responsibility. If the latter is seen to be more important then the policy should include clear guidelines for safe and acceptable behavior with serious consequences for misconduct. This should be in line with other e-Safety guidance.

“We found students became savvy and safe Internet users when exposed to authentic internet user experiences (though social networking happened only within a secure, teacher-managed platform). We found students quickly established a culture of responsible use of their devices, which seemed to enhance their learning rather than distracting them from it.”

With the new C2k service, schools will benefit from a comprehensive internet and email filtering service. There will be two main options available within the Internet filtering:

1. The first is the FULLY MANAGED SOLUTION. This solution prevents access to inappropriate sites, while permitting access to all other sites via groups. In addition to the core groups which are available by default, schools will have the option to assign users to three new groups: Internet Streaming (including YouTube), Internet Social Networking (including Facebook and Twitter) and Internet Advanced.

2. When users are given access to a group, they will have access to all sites within that group. Should schools require a more granular filtering solution, this will be available through a DELEGATED FILTERING SOLUTION. This will allow schools to enable access to specific sites to specific user(s), while retaining the security of the core-filtered solution.

Schools may be worried about allowing access to some previously blocked sites and services. However, research has shown that allowing pupils some access to real world experiences, such as social networking, in conjunction with carefully planned and delivered e-Safety education, can have the positive impact of teaching them responsible Internet use both in school and at home.

15 C2k Communications Team Feb 2013
3.0 FUTURE CLASSROOMS

3.1 PREPARE & SUPPORT

What are the first steps in preparing my school for mobile learning?

SETUP DEVICES WITH INITIAL SETTINGS AND AGREED RESTRICTIONS

There are several possibilities for setting up and managing devices depending on the quantity of devices and who will be managing them. As most rollouts of mobile devices have been with iPods and iPads, the following section will concentrate on some possible solutions for iOS devices.

Some initial considerations:

• How will we log and label devices?
• What system will we use to setup the devices?
• How will we secure the devices?
• How will we manage and monitor these devices?
• How will we deploy new content and apps to them?

Storage and charging

If iPads or other devices are stored at school, they should be recharged or topped up when they are not being used. For small sets of iPads, it may be enough to use large power adaptors to charge them and to lock them in stores or classrooms overnight.

For larger sets of iPads, it may be worth investing in some custom storage and syncing options. Some of these, such as carts can be costly and unwieldy but can be a good solution if security is a top priority for shared sets of devices that will remain in school. Cabinets and cases also offer security and protection, and again can work well for shared sets of classroom devices (please see section 2.7 for more details).

If your school is planning to allow students to take their devices home then it should be left up to the responsibility of each student to charge their own devices each night and store them in a safe place. This should be included in any Acceptable Usage Policies and student guidance.

Setup, restrictions and syncing

After you have decided on a rollout model you should have an idea of the types of restrictions (if any) you want to put in place on the mobile devices. You may have decided to have different settings and restrictions for teachers and students, and also for different year groups. Setting up one personal iPad is very straightforward, however if your school has purchased a large number of devices and wants to add customised settings and restrictions then the use of Apple Configurator or an alternative management system (MDM) may be the answer.

B E L O W A R E S O M E O P T I O N S T O C O N S I D E R:

iTunes (for small pilots and rollouts)

iTunes is Apple software that has been designed to manage, organise and play media on a PC or Mac computer, such as music and videos. It also allows you to sync an iPad or iPod to a computer, back that device up and also transfer images, videos, audio files, apps, eBooks and other files onto your device. It can be used to setup a small set of iPads using the following steps:

1. Setup one iPad with the settings and restrictions agreed for the set of iPads
2. Install the free iTunes software on a PC or Mac computer
3. Back the iPad up, by connecting it to iTunes via the USB cable
4. Disconnect the iPad
5. Connect the other iPads to be configured in the same way and “Restore from backup” (you could use a powered usb hub or syncing unit to sync multiple iPads at once)
6. Each iPad should now be setup in the same way as the first

After the devices are setup the school can either decide to manage app distribution and updates wirelessly on the iPads themselves (i.e teachers or pupils can download and update apps themselves) or be managed by the designated teacher using iTunes.

N.B. iTunes was originally designed to manage and sync a single device and can therefore be a bit temperamental when managing multiple devices. There are alternative iPad management solutions, (such as Meraki), that allow you to easily remove and add apps and media on multiple devices and it may be worth investing in an alternative if this is something that will need to be done regularly, (i.e. for shared sets of devices).

Apple Configurator (for larger rollouts)

Apple Configurator is free software available for Mac computers that allows users to setup up to 30 iOS devices at once. Administrators have the ability to backup and restore devices, apply custom settings, and install new apps onto devices. Please note that your school needs to have signed up to the Apple Volume Purchase Program to install apps using Apple Configurator.

Other mobile device management systems (for whole school or 1:1 rollouts)

Companies are now offering online off the shelf solutions for mobile device setup and management known as MDMs. Most of these have considerable cost implications but there are some free solutions such as Meraki. There is also the option to deploy a Mac MDM OSX server on your own network, which will completely manage all iPads and push settings to each device over a wireless network. These options will most likely require extra staff training, support and equipment.

“With the C2k Education Network, schools will have the ability to manage access by students to the wireless network. Further device management options, relating to enabling/disabling specific device features, are currently being explored. Further information on these will be provided when available”.

C2k Communications

Team Feb 2013
3.2 Begin with teachers

Distribute devices to teachers

Research has shown that allowing teachers adequate time and professional development can be vital to the success of the rollout of new technology. If your staff members are not comfortable and enthused then it is unlikely that they will integrate the technology into their teaching in meaningful ways. Allowing teachers (and ideally teaching assistants) access to the technology before pupils can help to alleviate any misgivings or fears, increase confidence and motivation and inspire ideas for classroom integration and pupil learning.

Provide initial teacher training

Although mobile devices generally tend to be more intuitive and user friendly, they still take time to get used to and teachers will appreciate initial training on the basics of the device to help get them started.

Case Study

St. Brendans Primary School, Moyraverty

After sending key staff members to iPad seminars at SELB AmmA Creative Learning Centre, St. Brendan’s P.S. decided to invest in 3 sets of 16 iPads. Building on links forged with AmmA, a whole staff training program was put in place with ‘increased use of inclusive technology’ written into the school development plan. School management have continued to drive the integration of iPads across all class groups with ongoing staff development and monitoring. The school are engaged in ongoing capacity building with support from AmmA and teachers are successfully integrating the iPad into classroom practice.

“As part of our school development plan, we want staff to increase their use of inclusive technology in the classroom. Staff have accelerated this beyond my expectations by embracing the iPad”

Mrs T. O Hagan, St. Brendans P.S, Moyraverty

Allow teachers time to experiment with their device (ideally over school holidays)

Once initial training has taken place it is a good idea to allow teachers time to experiment with their device. It is recommended that teachers should be allowed to purchase and download apps themselves under their own account so they can research and try out different apps that they might like to use in class. After this has happened, an audit can take place to assess whether further training is required and what this would include.

Design a procedure for teachers to recommend and request apps

Once teachers have had time to experiment with their devices they may most likely have a list of apps that they feel would be particularly useful to them for their teaching. You may already have a list of agreed apps that could be used by the whole school. However, teachers will be keen to recommend and use apps that are relevant to the subject areas and/or age groups they teach. Although your school may not have the budget to purchase all the apps suggested, a clear process for recommending and requesting apps will allow teachers to feel that their input is valued and therefore further enhance motivation to use the technology.

- Develop a criteria for evaluating if apps are appropriate for school use
- Teachers could suggest an “app of the week” for areas such as literacy and numeracy
- Keep records of apps recommended for different age groups, abilities and subject areas
- Keep a record of apps that are particularly useful

APP CLASSIFICATION

There are now a number of systems of app classification developed for education. However the CLCs have designed one specifically to be in line with the Northern Ireland Curriculum following the 5 E’s of the UICT Accreditation Scheme:

Explore
Apps that allow pupils to research, choose and use information and/or investigate and solve problems. Apps that allow pupils to record, note down, plan or log data.

Express
Apps that allow pupils to demonstrate their knowledge and understanding practically and creatively, through a variety of media.

Exchange
Apps that allow online collaboration to share and develop ideas.

Evaluate
Apps that allow pupils to document and evaluate the processes they have gone through to achieve a particular goal or task.

Exhibit
Apps that allow pupils to manage, backup, share and showcase their work.

There are a vast array of apps that are useful in the school environment for both teachers and pupils. Please contact the CLCs for more information on up-to-date app lists.

Case Study

St. Malachy’s College, Belfast

In St. Malachy’s College, iPads have been issued to all teaching staff and the pupils in years 9 and 13 have had the opportunity to purchase or enter into a lease agreement. Lois Stewart, Vice Principal at the College outlines some of the steps the school has taken to integrate the devices into teaching and learning:

“The use of iPads within lesson-based activities and as an administrative tool is a PRSD objective. The school is achieving this by providing fortnightly training sessions that initially focused on setting up and basic use of the iPads, and then moved on to focusing on key apps such as Keynote, Pages, Numbers and iMovie. Time within these sessions was set aside for groups of staff from each department to brainstorm ideas on how this technology could be infused into the schemes of work. All departmental meetings are required to include in the agenda ‘the sharing of good practice using the iPad’ and each of the staff training days held throughout the year have had a session dedicated to iPads and the sharing of good practice, at whole school level and within departments.

PROVIDE TRAINING ON SPECIFIC APPS/AREAS OF THE CURRICULUM

It may become clear that different training is required for each Key Stage and/or department. Training should be tailored and take into consideration a variety of skill and knowledge levels.

The Creative Learning Centres provide a selection of free teacher training courses throughout the year that can complement any training provided in school. Custom training and partnership programs are also available for primary and post-primary schools.

Your school should coordinate teams of teachers to work on integrating technology into their existing schemes of work and to develop new teaching plans.

Once teachers have had some time to experiment and have received additional training on specific apps, the next step is to allow teachers time to fully integrate the use of their devices in the classroom. A vital part of this is working in teams to share ideas, resources and knowledge.

EVALUATE HOW WELL TEACHERS ARE INTEGRATING MOBILE TECHNOLOGY INTO THEIR EVERYDAY TEACHING

Once teachers have started using the devices as teaching tools there should be regular meetings with the project team to ensure that the teachers are comfortable with integrating ICT into the classroom and are actively using their devices for teaching and learning. If some teachers are struggling with this, then further training and support should be given. It can be worthwhile identifying a mentor from within your teacher teams to support such teachers.
FUTURE CLASSROOMS

3.3 DEVELOP SUPPORT DOCUMENTATION AND RESOURCES

It will be important to provide support materials as part of the induction process for teachers and pupils. These could take the form of handouts, step-by-step guides or video tutorials on aspects of using the mobile device such as:

- Settings and accounts (e.g. email, Internet, calendars etc.)
- Backing up and sharing work (i.e. workflow options)
- Specific App guide
- “How to” – (e.g. How to create an eBook using a number of apps)

Some schools have created online courses for teachers and pupils that take them through different aspects of using the devices.

3.4 PREPARE A COMMUNICATION STRATEGY

It will be important to develop a clear communication strategy to stakeholders, parents and the wider community.

This may take the form of some or all of the following:

- Parent Information sessions (please see below for more detail)
- Presentations to business or community groups
- Information in a school newsletter
- Information on the school website and any linked social networking sites (i.e. PTA Twitter feed/Facebook page)
- Press releases to local newspapers

Think about possible concerns and questions from parents and the wider community and prepare answers to these in advance of any information sessions or presentations.

The introduction of new technology, especially on a large scale, can also attract press attention and schools need to have a strategy in place to deal with this and to counteract any possible negative feedback. You may need to think about whether or not you want to publicise the school’s new rollout of mobile technology.

“In order to keep staff knowledgeable we publish a newsletter called Ilongfield where we discuss apps being used, what’s good about them and what classes they are used in to share good practice. In order to produce these newsletters we put out surveys monitoring what apps are being used and whether they work or not.”

Vice Principal, Matisse College, Longfield Academy

Encouraging on-going parental involvement

After initial information sessions you may want to consider inviting parents to training sessions on certain aspects of using the mobile devices. If pupils are taking the devices home and are allowed to purchase their own apps, then it is advisable to provide parents with training and/or information sheets on using the devices responsibly and safely outside school. Providing some training on the basics of the device and some key apps will also encourage parental involvement with home learning.

Organise a parents information session

It appears that involving parents effectively in the planning stage, and providing training and information, are essential to ensure parental engagement and acceptance. While parents initially had misgivings about tablets, it helped a great deal if they were given training and support, and reassurances about safety and security. An unexpected but welcome advantage of this process reported by schools was that parents not normally engaged in school activities were keen to attend meetings about the tablet. The tablet appeared to offer a connection between school and parents that had not previously existed.

How your school involves parents will depend on the planned rollout model. If your rollout model involves parents buying or contributing to the cost of devices it will obviously be paramount to gain parental buy-in early on. This would also be the case with rollouts where the school owns the devices but pupils are able to take them home. In both cases, parents would need to sign up to a mobile device agreement with guidelines for acceptable use and responsibilities. These guidelines should take into consideration families’ individual access to wireless and polices on the use of technology at home (e.g. No Internet devices in bedrooms/after bedtime etc.)

Even if your rollout is small and involves only a small number of pupils who will use the devices in class it is still important to inform parents and involve them in the process. Getting parental understanding and support from the beginning can make it easier to progress a rollout at a later stage.

The information session could cover the following:

- The school’s ICT strategy and vision for mobile device use
- Research findings of the benefits to pupil learning and engagement
- Information about any financial implications
- Outline of Mobile Device Agreement to be signed by parents
- Time for Q&A

Some of these questions might be:

- How will mobile devices help my child to learn?
- My child already spends too much time playing games on computers, how is this any different?
- Are they not just a distraction from real work?
- Will my child still write and draw on paper?
- How will you stop my child accessing inappropriate websites and content?
- Is my child safe using these in school?
- How will you know if using mobile devices is making any difference?
- What happens if the device is lost, broken or stolen?
- Will my child not be more of a target for bullying if they take the devices home?
- I don’t have wireless at home. Will this be a problem for my child?
- What are the financial implications for my family?


4.0

How do I implement a mobile classroom?

WHAT IS A MOBILE CLASSROOM?

Broadly speaking, a ‘mobile classroom’ is an interactive learning environment in which mobile devices are used to deliver a lesson and/or facilitate learning. The mobile classroom is both the pedagogy and practicality of using mobile technology in school (and at home).

Impact on pedagogy and practice

Research has concluded that the introduction of mobile technology within schools has an impact on pedagogy and teaching styles. Teachers need to be aware that facilities, lesson planning and resources can and may need to be adapted and developed to suit a new classroom environment or practice (particularly if a school embarks on 1:1 deployment).

Lesson planning

• Not every lesson or activity is suited to using mobile devices. Teachers should not feel pressured to abandon other successful teaching methods and allow students to experiment and create with a variety of digital and non-digital tools.
• 1:1 programs typically work best within an experiential, project based environment where students are encouraged to use technology to research, explore and create.
• Lessons should incorporate apps/devices to accomplish learning objectives and targets, rather than be designed around the use of technology.
• Teachers should consider having a ‘tech-free’ backup lesson plan in case of unexpected technical problems or teacher absence.
• Teachers should allow time to practice before class in order to find and overcome flaws before pupils encounter them.

Classroom management

• Wireless enabled devices can free teachers from the restriction of leading from the front of the class.
• Being able to display and interact with the device while walking around the classroom can create a different student-teacher dynamic. It also allows teachers the opportunity to hand the device over to pupils and add input, or if pupils have their own devices, to allow them to display their own work for discussion.
• Think about classroom layout. Teachers may want to experiment with different options for different scenarios, (e.g. group work, class discussion, experiments and practical activities (i.e. animation/film etc.).
• Set clear expectations about behaviour when using mobile devices: e.g. it is a simple but good idea to have pupils place the device face down when not in use.

Facilities

• If teachers wish to display their mobile devices wirelessly on Smart Boards or projectors there will need to be adequate technical provision and support for this.
• As discussed previously, although Internet connectivity is not always required it can allow instant access to information during class and may be required for certain apps. Research has shown that integration of Internet access and research can greatly enhance the pupils’ learning experience.
• Think about classroom lighting in terms of excessive glare reflecting off mobile screens that may make working conditions difficult. Do you need to consider purchasing window blinds?

AREAS OF POTENTIAL CHANGE:

“Using iPod technology enabled the topics to become ‘real’. Pupil learning took place in an environment that was contrary to the normal classroom environment which was both stimulating and engaging. The project raised an awareness of the potential for iPads within a primary school setting and illustrated how the literacy programme can be evolved and enhanced using this technology.”
Mr. P Hart & Mr. P Loughran, St. Josephs, Madden

“The school is more about the individual learner, deciding on that day how they want to learn, moving them onto a point where you are always inquisitive, always pushing yourself... we’re not teaching, we’re facilitating. We’re in the room with them, we’re part of that journey, we’re part of that mastery of their skills.”
Teacher, Honeywood Community Science School

FUTURE CLASSROOMS

Facilities cont.

- If pupils are to use mobile devices over an extended period during the day, access to charging stations may be required, with devices being topped up over break times.
- Do you have headphones, styluses and covers for each device? Will pupils be responsible for buying these items? If you are doing group work, you may need to invest headphones splitters to allow more than one pupil to hear at once.
- How will you clean the screens? Make sure you don’t use any cleaning fluids.
- Do you have a location that’s convenient to classrooms for cart storage (if you intend on using one)? Who will be responsible for bringing this to and from classes?

Student-teacher workflows

It can be challenging sharing resources and work created on mobile devices between pupils and teachers. This is especially true when there is a lack of wireless connectivity in school. Make sure there are clear systems in place and provide training for teachers and pupils.

If pupils are creating work on mobile devices, they will need to understand how to organise and manage their work. This should be built into any initial induction and time should be set aside in class for regular backup.

Considerations:

- How will pupils submit work?
- How will teachers review pupils’ work and provide feedback?
- How will you get resources onto the devices e.g. videos and images?
- How will pupils and teachers backup their work?
- Do you need a procedure for periodic deletion of content so the devices’ storage does not become full?
- What naming conventions will be used to ensure work can be organised and managed easily by teachers and pupils?
- What storage system will you use - for example My Documents, a VLE, Google Apps for Education, SkyDrive?
- Will students be able to create online cloud accounts?
- Will there be access to wireless printers?
- Will teachers make use of online resources such as iTunesU, Alison online and Khan Academy?

THE “FLIPPED CLASSROOM”

The increase in access to the Internet through home computers and personal mobile devices has lead to some schools and colleges adopting alternative ways of delivering lesson content to pupils and students. An increasingly adopted teaching model is the ‘Flipped Classroom’ where pupils first study a topic independently (usually watching video lessons or listening to podcasts) before teaching model is the ‘Flipped Classroom’ where pupils first study a topic independently (usually watching video lessons or listening to podcasts) before class. Time in school is then spent on applying their knowledge through practical work and problem solving, teachers giving 1:1 help and facilitating discussion and interaction. Rather than adopting lecture-style delivery, teachers have more time to work with pupils on individual areas of difficulty, e.g. using differentiated instruction and developing hands-on creative work.

### 4.2 PLAN AND TIMETABLE PUPIL ACCESS TO SHARED SETS OF DEVICES

If your school is rolling out a shared set of mobile devices, then careful planning will need to take place to manage equal access to the devices for pupils. There are various ways of managing this and the method your school chooses will depend on what you want to achieve with the devices, the number of devices you have available and whether the devices will remain in school or be taken home by pupils.

#### Rotation method

Pupils work in class on different activities and rotate round them. For example, one group could be using desktop computers to explore a topic on the Internet; another could be using mobile devices to explore the topic through an app, whilst the rest of the class could be completing worksheets or written work.

#### Project based method

As most mobile devices are designed for personal use it can be time consuming to manage the backup and removal of work for different users on the one device. If they are to be used for more in depth exploration and creation it is advisable to allow individual pupils to have access to one device for longer periods of time and consider the option to allow pupils to take devices home. This project-based method could form part of the assessment for cross-curricular skills.

#### Class 1:1 pilot method

If you are considering a 1:1 rollout method in the future, it can be advisable to begin with a smaller pilot class or year group to evaluate how a larger rollout may work. This could be for an entire school year or a term but would need to allow sufficient access to the devices to adequately evaluate pupil impact. For best results, pupils should ideally be allowed to take devices home during the pilot. You will also need to consider if pupils take devices home over school holidays.

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### PROVIDE PUPIL INDUCTION

A key consideration prior to distribution is to have agreed clear boundaries for pupils regarding the care and use of mobile devices. Time for pupils to become familiar with using mobile devices is essential. Encouraging the sharing of pupils’ ideas and resources will engage and motivate the development and creative use of technology.

#### Issues to be considered include:

- **a. Care and maintenance**
  - Guidelines will need to be given on pupils care of shared 1:1 devices. For example:
    - keeping the devices clean
    - protecting them from damage
    - keeping the devices secure
    - steps for ensuring devices are ready for other users (e.g. removing personal files and backing up work)
    - personalising of 1:1 devices
    - reporting problems

- **b. Pupil terms of use and cyber safety**
  - If devices are to be kept in school then this should be covered by the schools’ e-Safety policies as discussed in section 2.9. However, if pupils will be taking the devices home there will need to be clear guidelines for pupils and parents on acceptable use outside school. Particular consideration should be given to the use of Internet and social networking and taking of photos or videos.

- **c. Device familiarisation**
  - As previously mentioned, mobile devices are generally more intuitive for users, especially in a time where most pupils have had contact with smartphones and/ or tablets outside school. However, it is worthwhile allowing pupils time to familiarise themselves with using the devices in what may be a different context and under different conditions or levels of restriction.
  - For schools deploying mobile devices on a 1:1 basis where devices traverse home and school environments, teachers should expect to allow time and offer clear direction to help pupils to get used to new ways of working and learning on mobile devices.

- **d. Specific app training**
  - Pupil induction should include some time focusing on the agreed core apps that will be used in school.

- **e. Sharing and backing up work**
  - Teachers will need to advise pupils of procedures for routinely backing up work according to how devices are being used in school and systems in place for storing work. This should include agreed file management structures and naming conventions.

- **f. Pupil feedback and idea-sharing**
  - It is worth considering building in regular time for pupils to share their learning, especially around useful or interesting apps and solutions to problems. This can further engage and motivate pupils and develop their thinking skills and personal capabilities.

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5.0 How do I know mobile learning is making a difference?

BASELINE PUPILS AND IMPLEMENT MONITORING SYSTEMS

It will be important to decide how your school will monitor and continually review the use of devices, infrastructure and the impact of the technology on learning outcomes and to appropriately baseline pupils before hand.

Evidence for impact on learning may be gained from a variety of sources such as:

- Attendance levels
- Engagement
- Literacy and Numeracy outcomes
- Development of Digital Literacy & ICT Skills
- External assessments such as GCSE performance
- The use made of collaboration in learning
- The extent of independent learning
- Teacher and pupil feedback on using mobile technology for learning
- Documentation of incidents such as damage, technical issues, theft etc.
- External evaluation

Remember that if your overall ICT strategy is to increase and enhance meaningful access to technology in general you may want to consider looking at the impact of using other technology such as desktop computers and laptops etc.

SUSTAIN AND DEVELOP MEANINGFUL ACCESS TO TECHNOLOGY

Work with mobile devices will need to be planned over a number of years in order to ensure that the technology is effectively embedded into the work of the school.

Planning may include:

- Ongoing opportunities for staff to showcase their practice and share experiences in developing learning with mobile technology
- Ongoing access to professional development as the use of devices extends through the school
- Evaluation of educational research, experiences of other schools and identification of possible developments that would benefit the school
- Ongoing evaluation of ICT infrastructure, equipment and support
This handbook marks the beginning of an exciting journey for schools and indeed, the Creative Learning Centres. We are yet to see how new mobile computers will change the ways in which technology is managed, accessed and utilised in schools. However, no matter the mechanism or device the key to success will always be a pupil-centered approach where questioning, creativity and learning are paramount.

It is vital that the use of mobile devices in schools is rooted in School Improvement and the enhancement and enrichment of learning at all levels. The huge potential for learning that mobile devices offer must not be taken for granted. Unlocking that potential requires a structured and considered strategy to be developed ahead of their deployment in the classroom.

This handbook provides some initial guidance in this process but in a rapidly changing digital environment, further independent guidance and assistance is available from the Creative Learning Centres.
7.0 Contacts & References

References


DCAL Unlocking Creativity: A Strategy for Development, 2000

NIFTC/BFI Education Policy Working Group, A Wider Literacy: The Case for Moving Image Media Education in Northern Ireland, 2004


AmmA Centre
Markethouse
Market Street
Armagh
BT6 17B
028 3751 2920
www.ammacentre.org

Nerve Centre
7-8 Magazine Street
Derry~Londonderry
BT48 6HJ
028 7126 0562
www.nervecentre.org

Studio ON
2 School Road
Crossnacreevy
Belfast
BT5 7UA
028 9044 9821
www.studio-on.org.uk