

Teaching & Learning in the ICT Rich Classroom

Redefining educational good practice in the light of innovations involving the wide scale deployment of laptop computers in school environments.

Version 3

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for

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Introduction

This guide is for primary and secondary teachers seeking reference information on educational good practice in the light of innovations involving the wide scale deployment of ICT in teaching and learning.

It has been written with the use of laptops in mind and in particular focuses upon the creation and application of web enabled teaching and learning resources.

Educational technology continues to evolve and with it the nature of teaching and learning and the roles of the teacher and student. Part of the excitement of exploring the use of laptops, in the pursuit of high quality education, is the redefinition of what constitutes good practice using contemporary information and learning technology.

This document is not intended as a manual for new teaching practice. The intention is that it should constitute a starting point for professional discussion within schools and during professional development. It covers issues relating to classroom management, teaching methodology, monitoring progression, enhancing online learning resources, new teaching strategies and laptop care.

As well as commenting in general terms about each of these topics, a bullet pointed list summarising key points is provided.

Classroom Management

The use of laptops in a classroom or wider teaching situation requires some thought. To begin with, with a portable device you are no longer tied to working in a classroom or a fixed classroom setting.

Consider where you stand and how you organise your room. Students no longer need to be seated, facing the same direction, or at tables arranged to view a blackboard. In other words, the students can view materials online on their own laptop. This has the advantage that they can work at their own pace and on materials that can be individualised towards their own learning.

Allow space for peripheral activities. For example, space to spread maps when doing geographical work, or set out equipment when doing computer control with a Roamer Turtle.

Be aware of what students are doing on their laptop whilst they should be working, for example, watch for pupils multi-tasking and using ALT +TAB to switch quickly between their class work and games, chat, or email. When giving teacher direction a good strategy is to ask students to close the lid on their laptop so that they are focusing in on the instruction. This requires that the laptop be configured so that it does not switch to “standby” when the lid is closed as this would result in a wait when students resume work.

Health and Safety is an important consideration in any teaching environment. In setting out the room consider the direction of any light source. Laptop screens can be tilted and the contrast altered so as to maximise the comfort of the user. Care needs to be given to making sure that for the comfort of students they do not spend too much time focusing at a set distance - i.e. staring at a laptop screen. In planning work, allow time for tasks that use distance vision or encourage older students to take responsibility for taking 'rest' periods to relax their eyes.

Some manufacturers have been known to exaggerate the battery life of budget laptop batteries. Wherever possible it is advised that users run their laptop via the battery in order to prolong battery life and avoid trailing cables. Trailing cables from laptop adapters are a tripping hazard and put students and expensive equipment at risk. Consideration needs to be given to allowing access to power points so that students can recharge their laptop. Some schools use strategies involving adapted cupboards or laptop safes to allow students to recharge equipment over break times, lunch or non-laptop sessions such as PE.

A significant advantage of laptops is their ability to streamline communication especially in a scenario in which they are deployed on a 1:1 ratio. This notwithstanding, care should be taken to monitor younger students' communication with others outside of the institution. Teachers should be mindful of the risk of students making contacts that could endanger their well-being.

- *Take care to arrange your room so that it is optimised for student learning using laptops, traditional layouts may be unsuitable as they mean that students are remote from power sockets or have light reflecting on their screen.*
- *Insist that students lower the lid on their laptop when the teacher is talking to so that they are not distracted.*
- *Watch for students playing games or sending email (the modern equivalent of passing notes) – rapid use of the ALT +TAB keyboard keys is a tell tale sign of multi tasking.*
- *Allow students the space for using other resources around their laptop – discourage students from using laptops on their laps for safety.*
- *Student network space and email usage should be monitored.*

Teaching Methodology

The use of laptops involves consideration of new teaching methods and specifically the development of a teaching style that integrates the use of ICT as seamlessly as possible into learning.

Inaccurate or poorly executed demonstration of software causes student frustration. It also leads to a situation where the teacher spends most of their time correcting students' understanding of ICT skills, rather than concentrating on the underlying concepts being taught.

ICT terminology has specific meaning and whilst it is perhaps unreasonable to expect that every high-level specialist term will be correctly used, clearly some degree of accuracy is desirable. It is helpful if regularly used terminology is agreed between colleagues and possibly added to class vocabulary lists.

Where students are expected to transport their laptops to and from school inevitably there are likely to be some students who will forget to bring them. Equally students who are awaiting laptop repairs are also likely to feel disadvantaged. Both eventualities necessitate building appropriate strategies into lesson plans. Time can also be saved if teachers have access to students' usernames, passwords and email addresses as forgetting any of these can be time wasting.

- *Explain specialist terminology using plain English and try not to make the assumption that all students will understand even simple specific terminology e.g. network, mouse pointer, glide pad etc.*
- *Explain the meaning of visual screen indicators such as icons that change colour or cursors that change shape for example, when resizing rather than drag / drop.*
- *A demonstration of software requires careful planning, precise description and accurate examples.*
- *Consistency between teachers, in term of use of vocabulary and style of demonstration, improves students' understanding.*
- *Have students' usernames, passwords and email addresses close to hand to avoid students having to find a technician.*

Monitoring Progression

Laptop usage can cause some parental concern and this is perhaps intensified by a view that laptop equipment is costly and that parents, who may be squeezing the family budget for an 'educational extra', are not getting value for their money. Parental ICT skill levels are obviously varied. Unlike written work in an exercise book it is sometimes more difficult to demonstrate student progression on a laptop. Instead of being able to quickly flick through the pages, files have to be found and loaded. Equally a new teacher taking over a class, or a school's senior manager auditing student achievement may experience similar difficulties in being able to quickly establish a student's progression.

- *Agree a filing structure for work carried out on the laptop so that it is easy to locate.*
- *Make a record in your mark book / teacher planner to indicate which task has been completed on a student's laptop.*
- *Build laptop activities into teaching schemes to ensure balance between laptop and other learning mechanisms.*
- *Allocate students their own web space so that they can publish their work to a space where it can be publicly viewed.*
- *Use a class web space to 'display' student's work as a positive reinforcement in the same way that it would be posted on a classroom notice board for all to see.*

Extending Learning

Laptops are a tremendous tool for extending learning. Irrespective of student ability laptops can be used to facilitate differentiated teaching. Through using a range of multi-media (text, audio, streaming video) the potential exists to tailor individual student's tasks to their preferred learning styles. This has been given new impetus though the wider availability of web enabled learning tools such as Encarta Class Server and learning portals such as Digital Brain.

There is a growing body of academic research, that supports anecdotal evidence, which suggests some students' literacy, team work and research skills can be developed significantly through constructionist teaching styles associated with what is popularly termed Anywhere, Anytime, Learning.

Once a base proficiency has been obtained, the benefits of using laptops for teachers is the ease with which teaching material can be (a) published, (b) shared with colleagues, and (c) modified for groups of differing ability or learning style. AAL work tends by its nature to be more child-centred and encourages students to work more collaboratively with peers and teachers.

- *Design teaching tasks that can be modified for small groups and publish these to carefully considered learning groups.*
- *Consider students preferred learning styles – can a task be modified so as to favour say, visual learners or auditory learners.*
- *Use multi-media to the advantage of students for whom English is an additional language, for example, add narration to a PowerPoint presentation so that correct pronunciation of difficult words can be heard.*
- *Give consideration to tasks that can be performed collaboratively. Design activities that involve email buddies from other countries or*

cultures. A good first activity for primary students is 'What is the same – What is different?'.

- *Encourage reluctant learners for whom a laptop is an incentive to work with, for example, a cyber poetry competition for a boy's literacy circle.*

Enhancing Online Learning Resources

Online learning resources allow a great deal of flexibility but require serious judgements to be made about their quality and suitability for purpose.

Teacher's personalised web pages are a means by which material can be made available to students and other teaching staff. Teachers can publish online revision sheets, homework, course outlines, classwork tasks, tutorial times, extra-curricular information (team lists and results), pupil assignments, work booklets, and topic / theme resources.

A significant advantage of web based learning materials is that assessment can be automated. This has benefits for teachers in terms of allowing them to spend time released from routine marking (which can be completed by computer) to devote to individual students. It allows teachers to spend a greater amount of time focusing on children's learning, for example, negotiating individual targets with students to raise performance or supporting individual or small groups of learners with specific learning difficulties.

From a student and parental perspective, automated assessment gives instant or near instant feedback on performance. It can also give instant or near instant results / grades and these can be accessed via the Internet allowing parents and students to track a child's progress in a more satisfactory manner than say, having to wait for the next parent's evening. This information is protected from public view by a password known to the parent and student. Online assessment tends to have greater authenticity in that it is designed at the time of creating associated learning content. Thus it tends to be constructed with specific outcomes in mind relating to student performance. A variety of online assessment tools are available including "QUIA" and "Hot Potatoes". Further information on Hot Potatoes and QUIA can be found in the section below on Teaching Strategies and also in appendix 1.

The appearance of web-based learning resources can be improved with a few simple tricks that need not be time consuming given a little practice. Use of colour, background images and animations can be effective in personalising work to individual groups of students or topics. A number of animation libraries are available online although their speed can vary. Try Icon Bazaar at <http://www.iconbazaar.com> for appropriate images. Spelling of this URL (web address) must be accurate as inappropriate images can be found at a site with a similar URL.

Locating resources to include on web pages requires careful thought. A number of sites exist which have lists of resources sorted by topic and age. A

good starting point is the Web n'Blue Learning Sites Library although much of the material has an American emphasis. The Web n'Blue Learning Sites Library can be located at <http://www.kn.pacbell.com/wired/bluewebn/>

Where a school is developing its own Intranet materials it is especially important to give consideration to the purpose and form of the web site. The management of the site in terms of its production and maintenance needs to be considered also. Whilst on the one hand the dynamic nature of a school Intranet encourages student and teacher use, there is some material that should be treated as fixed. For example, it can be very frustrating if the individual maintaining a site removes content that is to be used by a teacher without warning. The best school Intranet sites strike a balance between allowing teachers individuality to be creative but standardise page layout so that it has a uniformity that looks professional and aids student navigation of the site. A series of criteria for judging the quality of online learning material can be found in appendix 2.

Web sites that are too hierarchal tend to conceal the task and individual lesson content within the site. As a rule of thumb if the task and lesson content is more than three mouse clicks away from the sites' home page expect some discontentment. Web based work needs to be accurate and like other material free from typing errors. In addition hyperlinks between pages need to be checked. A good strategy is to "stage" web material for editing (by a Head Teacher or Head of Faculty) prior to publishing online for all to see.

- *Have each teacher produce his or her own web page as part of an in-service day. Include teacher's photographs taken with a digital camera.*
- *Publicise the means by which parents can access student's marks / grades online.*
- *Raise the profile of the home / school partnership by giving parent's and students a password that allows them to access results online at anytime.*
- *Build centralised online record keeping into the school's assessment and marking policy. Encourage parents to access student's SAT results, attendance record and termly / yearly exam results online.*
- *Build online "concept checks" into web based learning materials so that student understanding can be verified and students provided with instant feedback.*
- *Make a conscious effort to use the time saved through online assessment to raise student performance through supporting special needs students etc.*

- *Agree a policy by which a school's Intranet site should be developed – identify key (dynamic) content that will be updated on a regular basis and material that will be fixed and only updated on an annual basis.*
- *Decide a means by which the quality of web based learning resources will be maintained – consider staging Intranet pages prior to their publication so that they can be checked and their style and / or content edited. Decide on an editorial standard and who will enforce it.*

New Teaching Strategies

The use of new learning technology including laptops provides the opportunity to explore and develop new teaching strategies and styles of education that compliment more traditional teaching methods.

The use of laptops and associated high-end software encourages collaborative work between groups of teachers in the same way in which it promotes collaborative learning between groups of pupils. What is interesting is the changing nature of the role between pupil and teacher and the manner in which this relationship can evolve, for example, into peer teaching between pupil and teacher. It is also recognised that students' use of AAL encourages pupils to take a greater ownership of their own learning.

The utilisation of web-based tools including email, chat, discussion groups, video conferencing and bulletin boards provides a multitude of contemporary opportunities for creating novel teaching tasks. The Internet allows for a wealth of research projects that include a range of research skills associated with finding information from reliable sources and manipulating relevant data to test hypothesis or draw meaningful conclusions.

A number of teaching techniques / strategies capitalise on the potential of web-based learning. They include Big Six, Web Quests, Collaborative Learning, Themed Days, Virtual Tours, Electronic Field Trips, Online Events and Back to Base.

- a) The Big Six[®] is a method for researching and problem solving that adapts itself well to the Internet as well as other data sources. Web Quests are well-researched tasks that allow students to find reliable information from the Internet on specific topics. These lend themselves to integration into Themed Days in which teachers across classes or subjects pursue a topic from different dimensions perhaps through group rotation.
- b) Collaborative Learning makes use of features in the Microsoft Office suite to exchange files, draft / redraft documents / presentations, or participate in discussions on common files or sets of documents across a network.
- c) Virtual Tours encourage a range of skills – set pupils the task of researching a journey to a distant destination and have them plan their

journey, accommodation, sight seeing and budget. Virtual Tours encourage Internet research skills, use of word processing and spreadsheet. They make ideal team activities and can be expanded to include presentational skills if, for example, competing teams have to present their find to a target audience.

- d) Electronic Field Trips are particularly significant because they can take students to places that up to now have been inaccessible, hazardous to visit, or protected to maintain their preservation. These include ancient / historic sites or those of religious / cultural significance. Real field visits are often difficult to calendar, time consuming, and sometimes too expensive for all to participate in. They also pose a problem to students who are disabled.
- e) Online Events make use of guest speakers or online experts who form a panel that pupils can examine on a given topic. A variation on this is to have students reporting back to base from a field trip or school exchange whilst it is in progress. Parents, senior teachers or the students who will be on the trip / exchange next year make a good target audience.

- *Make a conscious effort to explore new teaching strategies associated with laptop use and share good practice / successful projects with colleagues through a newsgroup.*
- *Instead of having class discussions try publishing stimulating material on a web page and using the Discuss icon on Microsoft "Internet Explorer 5" to facilitate a prolonged debate over a week. A benefit is that you can assess individual students' contributions objectively.*
- *Design a Web Quest and share it online for others to use.*
- *Use Netmeeting or a similar inexpensive Video Conferencing program to have students report back to the Head Teacher on their field trip*
- *Ask a student to teach you something that they have learnt on their laptop and then demonstrate it to another student yourself.*

Further information on some of the strategies above can be found in appendix 1.

Laptop Care

Laptops are clearly desirable objects for thieves in that they are high cost items and easily transported. Coupled with the fact that children make soft targets and schools tend to be public spaces, educational laptops are a tempting target. Unfortunately the threat of theft comes from both inside and outside the school institution. It is important that schools have a clear policy in relation to safeguarding laptops that includes taking reasonable steps to prevent laptop theft. This should include keeping an accurate register of

equipment, security marking equipment (including bags, wireless cards and adapters), and briefing students and staff in minimising the risk of theft in and out of school.

Perhaps of greater concern is laptop damage caused by careless use or vandalism. Some students have little appreciation of the material value of a laptop. Damage may take the form of graffiti to the laptop bag or laptop itself. Students have been known to swap keyboard keys with friends (to make patterns / spell words on separate keyboards). As well as removing trim and decals, students have been known to damage displays (puncture them with a compass point to see if they leak) or remove internal components.

Many schools have already developed acceptable use policies for students. As well as covering laptop care these also regularly include rules or guidance relating to safe and appropriate use of network space, email, chat rooms etc.

- *Security engrave equipment, maintain a register and agree a policy of safe places to store / use laptop equipment.*
- *Encourage students to identify / personalise their laptop bag in a non-permanent manner, for example with a soft toy, ribbon, key ring or luggage label.*
- *Agree the method for dealing with unattended laptops in school. This might include taking the laptop to a secure office of keeping the laptop and calling an agreed phone number.*
- *Advise students, teachers and parents how to avoid theft and mugging.*
- *Devise a procedure for dealing with lost or stolen laptops – design a form that students circulate over two days to look for a missing laptop. Have the form signed off by the Head Teacher before a crime number is obtained from the police.*
- *Establish a routine for checking the physical condition of laptops and bags. A good time could be when checking reading books or signing homework diaries.*
- *Develop a school policy for appropriate ICT usage that includes use of the Internet, network space, email etc. and publicise this with students, teachers and parents. A good starting point would be to look at the resources at the NGfL web site. This is located at http://www.ngfl.gov.uk/grid_safety/index.html*
- *Student network space and email usage should be monitored and sanctions agreed prior to their being needed.*

Appendix 1

Further Reading

Hot Potatoes

“Hot Potatoes” is a utility that can be used to produce six different types of activity that could be used for teaching tasks and / or assessment. The utility is downloaded via the Internet from the University of Victoria in Canada. It allows teachers to create material that uses short answers, multiple choice, matching and ordering, jumbled sentences and more. An email account is required to register and obtain a user key. This professional and reliable tool is free to schools and other non-profit making organisations.

For further information see <http://web.uvic.ca/hrd/halfbaked>

QUIA

“QUIA” is a web based learning tool kit that allows teachers to create assessment and learning material that can be browsed online through the Internet. The tools allow the user to create a wide variety of games and aids to teaching including flash cards, matching pairs, word searches, crosswords, hangman, jumbled words, and more. QUIA has the facility to produce quizzes that can be used to check a pupil’s understanding. Although not obligatory it is possible to share resources that a teacher creates with other colleagues or to make use of materials already written and posted by others. QUIA makes good use of feedback to inform pupils of mistakes and has advanced features for recording grades.

For further information see <http://www.quia.com>

Big Six

The “Big Six” is a six-step skill set that encourages the development of information problem solving. In brief the six-step approach encompasses task definition, information seeking strategies (that need not be internet based), location and access, use of information, synthesis, and, evaluation.

For further information see <http://www.big6.com>

Web Quests

“Web Quests” are the creation of Bernie Dodge of San Diego State University. Web Quests are carefully planned research and problem-solving tasks that make use of good quality web sites. BECTA has given its approval to a site in the UK that links Web Quests to the National Curriculum.

For further information see <http://www.webquestuk.org.uk>

Appendix 2

Criteria for Judging the Quality of Web Pages used for Teaching and Learning

Good web based learning resources: -

Are ...	Are not ...
Easy to navigate – Content is easily accessible using a <u>simple</u> search facility or clear hierarchical menu.	Misleading to users though inconsistent use of navigation icons, buttons or menus.
Written in language suited to the intended target audience.	Jargon free and avoid specialist terminology that requires undue explanation by the teacher.
Exemplified by use of animation that captures the viewers' interest or that diagrammatically explains concepts involving movement.	Overly packed with animation that distracts the viewers' attention from the educational content.
Colourful and make use of multi-media including sound, images and moving images.	Garish in their use of colour, fancy fonts and multi-media.
Likely to give information but also check that it has been understood though using "concept checks" and other online assessment.	An on screen alternative to a traditional textbook that contains page after page of text.
Differentiated – Contain tasks for students of differing ability.	An online alternative to the traditional handout sheet that contains little thought in regard to different student ability.
Designed to stimulate interest and encourage research by containing hyperlinks to other web sites that provide accurate information or other material that allows enrichment of the learning task.	A list of other web sites resulting from a quick search of the Internet and that are of unknown quality or benefit. An encouragement to wander the Internet.
Designed to involve students in group and / or teamwork that encourages collaboration between students or teachers and students.	Loan tasks that rely on computer based training over prolonged periods.
Designed to encourage children to work at their own pace through individualising learning.	A reward for completing paper based tasks quickly and used as a form of "edutainment."
Structured into other learning by careful planning.	Bolt on computer tasks taught in isolation.
A powerful additional tool designed by teachers, that create learning opportunities focussed to their individual pupils' needs. They are in part designed to provide teacher time for other pupil-focussed functions.	A threat to teachers' status or skill base.