Scan More; Print Less

How schools increase learning while reducing teacher workload by going digital

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The Education Technology Association

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Foreword from the Sponsor

Even when everyone in schools has their own computer device paper will still be used for many things. Children will also produce much work that is physical - drawings, pictures, constructions as well as handwriting. One of the most powerful impacts of digitising and making these scans and images available online is in making pupils' work much more visible. This radically increases the feedback and comments that children get on their work and helps them to see their progress much more clearly.

If this alone were not enough reason to bring together the digital and paper worlds in school, the technology now enables previously printed documents to be turned into word processor files as they are scanned, and for tables of handwritten figures to become spreadsheet files, both enabling paper copies to be further developed and amended and to be shared widely.

The operational effectiveness of schools that fully embed the digital environment alongside the non-digital is hugely better, through much more effective communications, information sharing and the ability for all to instantly see and access what they need for their work.

At Fujitsu we are proud to be helping with this revolution which impacts so deeply to improve childrens' learning and the work-life balance for school staff. We are working with schools in making technology accessible to all and ensuring that the digital skills pupils gain fully equips them to deal with whatever future employment opportunities are thrown at them.

Brian Fortune, Sales Director

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About the Author

After being a teacher and head of department in a secondary school Roger Broadie was seconded in 1982 to the UK government Microelectronics Education Programme that led the introduction of computer technology into schools.

In various roles since then Roger has worked with a huge range of individual leading schools, school leaders, education authorities and government agencies, education technology companies and school improvement professionals, across the UK, Europe and other parts of the world. This eGuide draws on the many conversations with these people on how schools are capitalising on technology and the connected world to transform education. Roger has particularly focused on researching and understanding the impact of the better practice reported to be happening in digitally evolved schools and why it produces better learning.

Currently he leads Naace's work on Third Millennium Learning, is a co-author of the Taxonomy of School Digital Evolution and cofounder of the online School Digital Evolution Group, and is a MirandaNet Fellow.
Summary

When, in a school, all teachers, pupils and parents have ready and immediate access to the Internet the school can radically reduce the use of paper, to just those uses where the nature of paper adds value to the activity. This has several important positive impacts.

It saves large amounts of money annually in paper, copying and time costs, which the school can then re-direct to other purposes. But more importantly, the educational and organisational impact of digitising a wide variety of communications and resources is very high. It enables teaching and learning to be made much more effective while at the same time reducing workload.

The key areas of impact are:

Communications. The paradigm can change from information being pushed out through the centre, with the consequent admin load, to one where many people are information providers, able to instantly update the information they are responsible for. The workload in receiving information is reduced to being informed that information is available and where to find it when needed.

Online support for learning. This enables home learning to be much more effective, extending learning time. It can also enable class teaching to be more engaging and the quality of lessons more replicable across different teachers. In establishing both of these teachers can collaborate and share what is put online, reducing their individual workload.

Digitally capturing evidence pupils' work and progress. Once pupils' work is digitised and made visible online, the ways in which it can be used are radically extended. There can be much wider feedback to the pupils from peers, teachers and family. Examples of good work can be shared to set higher expectations. Teachers can more easily discuss and moderate standards. And pupils can much more clearly see their progress, which can stimulate them to take on more aspirational challenges when combined with development of a growth-mindset culture.

Professional development and parental support. Professional development resources acquired on paper can be scanned to become files, that can be tailored to the school’s needs and further developed. These can be accessible to all teachers as needed. Resources to help parents understand how their children are being taught can be made available without the cost of paper and its distribution, while also making them more accessible to parents.

Office systems. Systems that need to operate on paper can be integrated into more effective office digital systems. Batches of papers can be rapidly scanned. Paper received from third parties can be digitised to be instantly accessible for look-up and records, and if required be scanned into spreadsheet or word-processor files.

To achieve these impacts schools need to establish a digital environment and provide equipment with which individuals and groups can digitise and upload. Teachers, parents and pupils must have ready access to everything in the digital environment which they have permission to use so that the paper systems can be abandoned.
The impact of digitisation in more detail

Digitisation impacts in two main ways:
- it generates considerable savings on paper, copying and most importantly time.
- it makes the activities of the school and pupils much more visible. This acts in numerous ways to engage pupils, teachers and parents with the key task of the school, providing what each individual pupil needs to learn best. If associated with the generation of a culture, curriculum and teaching that ignites pupils' thirst for learning this can take the achievement of pupils to a level that surpasses good traditional learning.

The first pre-condition to achieve these impacts is that whole cohorts of first teachers, then pupils and parents have the degree of access to the internet that makes it possible for the school leaders to demand teachers and pupils, and to expect parents, to logon - instantly a question occurs to them that they can themselves answer online, or can ask of others online. The second precondition is that all can without hesitation capture a digital image, scan or copy of information, resources or evidence of pupils' activities and work and can, also without hesitation, post this to the appropriate place online.

Communications and information. In a paper-based environment the communications paradigm is that of communications pushed out to those who need the information. This is centrally controlled because it involves costs. When the school moves to a digital environment for communications, the paradigm can become one of information users accessing what they need when they need it. Anyone who is an information provider can be given the access to post information online for others as part of the task of creating it, not as a separate task through others. The only information that is pushed out is notices that new information is available and where to find it. It becomes possible to ban the use of email for anything that does not require the recipient to immediately act on the information provided. This provides a very welcome reduction in the email load on teachers and school leaders.

The annual savings in paper, copying and admin staff time, as we explore later on in this white paper, will be more than the cost of establishing and managing the online environment to hold information. The time saved by information users, once they overcome initial reluctance to go online, is a major factor in making them willing to engage with the changed way of providing and accessing information and in enabling them to improve how they do their job. Their exposure to the ease with which information can be shared online opens their minds to ways in which this possibility can enhance different parts of teaching and learning, leading to the improvements in learning, as detailed in the following sections.

However the most important impact is that making information instantly accessible to users forces all, particularly the pupils, to realise that it is their responsibility to get the information and resources necessary to help them learn. This helps them to take responsibility for their learning.

Online support for learning. Homework is the most problematic part of pupils' learning for most teachers, as many pupils produce poor and incomplete work. Parents have difficulty discovering from their children what homework is to be done and in helping them with it. The situation is radically improved when details of the homework and resources to structure pupils' work and to help them do it is posted online. Providing online support for homework can be a collaborative effort between teachers in a year-group or subject department, reducing individual teachers' workload.

When pupils willingly share their work digitally with their classmates, in class discussions, collaborative work or in contributing to online discussions, peer pressure is generated that stimulates pupils to do the work and to make more effort. Teachers can also start to use techniques such as mid-work marking. By providing comments on the first draft of a piece of work, to help the pupil improve it, the teacher's feedback can be acted upon and result in improved grades, which is considerably more powerful that just providing feedback on completed work.
Schools that regularly and effectively support home learning in this way discover that the online information and resources are also very supportive of teaching and learning in class. This, together with pupils taking more personal responsibility for their learning activity (within the context of better online guidance on the work to be done) reduces the class time teachers have to spend making learning activity happen. This enables them to spend more of class time helping pupils raise the level of the outcomes of their work, to achieve more.

**Digitally capturing evidence of pupils' work and progress.** Pupils' work done digitally, or if on paper or practical that is scanned or imaged, becomes much more visible - to the pupils, their teachers, and their parents and family. Pupils can see their progress much more clearly. When this is associated with creation of a 'growth mindset' culture in the school, with pupils believing that failures are the first steps to success and having the understanding that the purpose of the school community is for all to help each other learn, pupils can come to believe more strongly in their ability to succeed.

A strong focus on visible progress, even if from a low base and slow, helps pupils to appreciate that if they cannot do something, it is a matter of them not being able to do it yet, rather than them being incapable of doing it. This is reinforced if their visible progress is shared with family and peers. The social help from peers and family to overcome their difficulties makes it easier and more fun to take on learning challenges that are aspirational and which stretch their capabilities.

**Professional development and parental support.** Many professional development resources are acquired by teachers on paper. Once scanned these can be made available to others. Once the costs of providing information on learning approaches to parents are removed, parents can be much better supported in helping their children learn.

**Office systems.** Paper remains the most effective medium for many purposes. Examples in school are pupils' test papers or other work best done on paper, meeting notes taken by hand, and time sheets or other forms submitted by part-time staff or parents. Examples relating to third parties that the school works with include invoices, quotes, letters sent and letters received.

All of these can be handled much faster and more effectively if they can be rapidly scanned and then worked on, further communicated or referenced digitally. Of particular note is that scanning software is now able to scan text into word-processor files and tabular data into spreadsheet files. This can remove a very time consuming office task.
Technology Issues

Technology preconditions. There can be a reluctance to move from paper systems to online systems. This may be because of a fear of technology, unwillingness to learn how to use online systems (even though many are very easy to use) or because it requires people to move from the traditional and comfortable process of having information given to them, to them having to take responsibility for finding and accessing it themselves.

It is necessary for the school leaders to actively lead this change to online digital processes. Some staff may need to be pushed to adopt online access by removal of the paper-based systems and insistence that the only method of access is online. This requires that there can be no excuses for inability to get online. The first requirement is for all the school teaching staff and assistants to be instantly able to get online from any location where they work, without having to wait for or negotiate the use of shared computers. Inability to instantly access information causes hesitations or blocks to work that absorb a considerable amount of time.

The school can decide whether the next step after moving teachers to using the digital environment is out-of-school access to information by pupils and parents or whether in-school access by all pupils should be first. It is easier to act first on out-of-school access as all schools already provide information through their website and many parents now use the internet regularly. The key decision is to make online the route for all important and urgent information. The difficulties are:
- that some parents may not be able to access online and hence need paper communications.
- that a small minority of pupils may not have out-of-school access to the internet. In this case the key realisation is that the majority are being disadvantaged if the move to online is avoided for this reason. This can be mitigated through in-school access before and after school and during breaks.

Giving all pupils instant in-school access to online information and resources is a more difficult decision but it is an inevitable development for all pupils from an age of 7 or 8. This can be restricted to out-of-class access, however the benefits to learning of pupils having access to online resources and the ability to look up information in class are huge. The necessity is for the school to generate the culture of engaging teaching and a strong thirst for learning amongst the pupils, such that the distractions possible through connected devices are avoided by the pupils themselves.

Once teachers know that all pupils can access online learning support in and out of class they can re-balance teaching and learning, causing more learning to happen from their teaching.

Online systems and storage locations. It is possible for schools to have an online environment made up of many different systems, or a coherent environment with a single interface through which all systems are accessed. The decisions about what online systems to adopt is best approached from the following considerations:
- Privacy. Do the information and resources to be made available through the system need to be restricted to specific people who have logons.
- Age restrictions. Some social networks cannot be legally accessed by younger children.
- Passwords. Multiple systems with separate logons entails memorisation of multiple passwords.
- Ease of posting information and resources. If it is at all difficult to upload to the system this will inhibit provision and updating of information and resources and create an added workload.
- Tagging. It must be possible to quickly and easily upload to a specific place, such as certain child's portfolio of work, or places accessible only to defined groups such as a class or year-group.
- Data security. Information required for purposes in the future such as assessment of pupils' work needs to remain accessible even in the event of the provider of the system going out of business. Information that is sensitive must be handled and stored in accordance with legal requirements.

Management. In paper-based systems the provision of information and its communication are usually separated into different functions managed by different people. In a digital environment the most effective
approach is to give the originator of the information or resource access and responsibility to also upload this to the online system and to update it as necessary.

The exception to this is when what is provided needs to be moderated or authorised. The approach that brings most beneficial impact of moving from paper to digital is to establish acceptable use practices and then to trust information providers to abide by these. This applies to pupils and parents as well as teachers, when they take responsibility for areas of school life that need to shared with the school community. Development of this trust is aided if the online systems provide an audit trail, that all know about, so that should any malicious or damaging post be made it is clear who is responsible and appropriate action and training can happen.

**Scanning and digitising.** There are numerous devices available which can be used to make digital copies of information, pupils' work and school activities. Issues to be considered are as follows.

**Video** - This is a very powerful way of capturing evidence of pupils' activity and work, particularly for activities such as drama, dance and PE. It helps pupils reflect on their work and to demonstrate capabilities. It is highly engaging for pupils and their parents to see video of them working and achieving. However use of video requires watching the whole video which is less time-effective.

**Audio** - Verbal recorded feedback by teachers and verbal recorded reflection by pupils can often be faster and more insightful than when this is done in written form. Recording multiplies its use.

**Still images** - The ease with which images can be taken on mobile devices combined with the richness of what images can communicate make them a highly effective way to instantly capture things such as evidence of pupils' work. Issues to be considered are:
- that the quality of the image will be less than a scanned image
- that the school may not wish images of (some) pupils in school to exist on teachers' or pupils' personal mobile devices for esafety reasons.

**Scanned files** - This includes use of feed and flatbed scanners and visualiser-type devices. Due to the nature of these devices and their software they have a number of advantages:
- quality of images is usually very high.
- they create content that is searchable and retrievable, not just an image
- some scanners can automatically adjust for issues such as curved pages in the middle of books.
- the good depth of field and lighting on some overhead and/or visualiser-type scanners can enable the digital images of 3D objects to be of considerably higher quality than a photo image.
- some scanners come bundled with OCR software that can convert what they scan into digital files, such as word-processor files from text or spreadsheet files from tables, enabling information to be further analysed or developed.
- some scanners can rapidly batch-scan a series of sheets of paper, enabling the work of a whole class or a set of office papers to be digitised time-effectively. These can be mixed batches of documents that don't need to be pre-sorted into size but instead the size scanned will be automatically recognised and cropped accordingly.
- Automated functions like auto rotation, de-skew, blank page removal and auto colour detection will help minimise operator time both pre and post the scan process.
Financial savings

Calculating savings. It is easy to establish a simple spreadsheet to estimate possible savings from going digital.

- Estimate the number of staff and pupil information sheets provided over a year, and letters to parents.
- Longer documents such as school parent handbooks, new staff handbooks and reports to governors can be multipage and hence cost a lot even if only provided to a few people,
- In a secondary school with 1000 pupils and 4 lessons/day just one photocopied sheet used in each lesson would at 1p/sheet cost £8000.
- Each photocopying task might take 10 minutes, once the time to assemble what is to be photocopied and to go to and from the photocopier is taken into account. Uploading might take only 3 minutes. If all 120 staff in a secondary school photocopied 4 things a week, this would amount to a staff time saving of 2,240 hours which might equates to a cost of £33,000 annually.
- If checking email takes each member of staff 15 minutes daily, which could be reduced to 5 minutes, this amounts to a saving of 5,600 hours of teacher time in a 120 staff secondary school. This might equate to £60,000 annually.
- Admin staff having to reference and use paper documents might only save a minute or two in doing this digitally instead of on paper. However if this happens 10 times a day for 3 admin staff the saving might be £2000 of admin time. This will be an under-estimate of time saved.
- If each pupil saved 10 minutes a day through being able to look up something that otherwise would cause hesitations in their work, this would amount to a complete extra week of learning over the year. The increase in pupil time on task in lessons, and in doing homework, is the major impact from giving pupils the ability to access the internet when needed.
- The use of online systems will also change the in-school IT requirements. There will be a reduction in the network storage required and a reduction in printing devices and costs.
- Once a school decides to move to the use of mobile devices, replacement of the majority of desktop computers is no longer required. The school may also decide to take advantage of the personal devices owned by teachers and pupils to make further savings, though schools might decide that some or all of these need to be funded by the school for inclusion reasons.
**Schools' views on how to approach the use of online systems**

Schools are taking different approaches as they progress towards more digitisation of information and resources. The following examples give views as to how and why this should be tackled.

**Landhead Primary School, Ballymoney, Northern Ireland, [http://landheadps.co.uk/](http://landheadps.co.uk/)**

Our aims in making more use of online systems are a combination of savings, better teaching and better learning. To reduce workload for teachers and support staff we want to eliminate unnecessary copying and printing, and distribution time. Enabling teachers to file share, providing better access and ability to edit means they can tailor resources produced by others for their own class. Online access also increases security without the need for staff to have hard copies that could be lost or mislaid with sensitive information. The long term aim within the next couple of years is ideally a paperless classroom. We hope that the children will use online support for learning to enable accessibility everywhere extending the time they spend learning.

Michele Henry, Principal

**Holmfirth High School, Holmfirth, Yorkshire, [https://www.holmfirthhigh.co.uk](https://www.holmfirthhigh.co.uk)**

With the sharing and collaborative capabilities available to us in Office 365, we've embedded new and exciting ways of working. Office 365 groups allow both small and large teams of staff to communicate and collaborate in one central area, without the need for uploading and downloading resources. Using this facility we have managed to:
- Reduce storage on the school network.
- Save time and effort in collating responses or feedback from groups of staff.
- Communicate effectively with colleagues.
- Easily manage time and arrange meetings using the calendar facilities.

By driving homework and assignments via a digital platform - Frog in our case - we are instantly seeing benefits for both teaching staff and students. Although this is not currently a whole school strategy whereby all homework's are pushed through Frog, this is something we will be working towards. Key benefits:
- Resources are available online reducing printing costs and minimising the risk of resources being lost!
- Online activities can be assigned easily with direct links to a website, resource or media files.
- Homework tasks can be viewed and monitored by staff, students and parents for complete transparency.

Chris Langstaff, VLE Administrator

**St Mary's College, Derry, Northern Ireland, [http://www.stmarysderry.com/](http://www.stmarysderry.com/)**

Our vision is to make the school paper-less. Years ago all our staff and pupil briefings went online and printed memos are a thing of the past. We tackled the large amount we spent on printing by installing the PaperCut software which queues the printing until it is released and printed centrally. We no longer have printers in classrooms and we have saved most of the £10,000 per year that we used to spend on paper and toners. The printing that is done is much more economical. We now have 1:1 computer provision with all pupils having their own device. A lot of the learning content is now accessed digitally through our Fronter VLE and a lot of pupil testing is now online instead of on paper.

Paul Wade, ICT Support Manager
Hartsdown Academy, Margate, Kent, http://www.hartsdown.org/
When I become responsible for performance management for all staff, I soon realised that the paper based system we had in place wasn’t efficient. I found it very difficult to put my hands on all of the performance management data and I quickly discovered that when people had moved positions, departments or left the school, much of this paperwork was lost and this simply was not good enough. We wanted complete transparency and to create a clear pathway giving staff ownership of their own performance management and CPD so that with any decision made relating to performance related pay, there was evidence to support it. The SchooliP system we use also ensured line managers were taking ownership of performance management of their own staff. We were keen for line managers to be more involved and to remove the perception of performance management being perceived as just a tick box exercise. The transparent nature of SchooliP enables line managers to understand the needs of their staff and how they are contributing to wider school improvement.

Charlie Barber, Vice Principal

We worked with Learnmaker to move lots of what we do online using Google systems, which has led to many efficiencies in cost and time. This has led to a saving of £30,000 on IT procurement and maintenance, and we are saving £24,000 a year across various school budgets. For example photocopying has reduced enormously. Time saving for the school staff through more efficient ways of sharing information is high. The email load has reduced; in excess of 6000 fewer emails are sent every month. We reckon 56 hours are being saved every week. Resources have gone online as well, with 34,000 truly collaborative resources shared. There has been a massive impact on teaching and learning which is 100% positive. The biggest impact for the teachers has been in enabling collaboration, as it is now much easier for them to collaborate on lesson planning. They can work on the same document together online and by working together they are being more creative. Leadership time has also been saved; we have a much more streamlined approach which has helped a lot in improving work-life balance. All of this is really helping with our educational vision which is centred on connection to the world, helping the children connect with others round the world.
Naace has produced this series of Essential Guides, or “eGuides” in response to an identified gap in guidance for school leaders. That is, how to use technology creatively and effectively to make significant impacts on learning and standards in other curriculum areas.

Naace believes that technology has a major role to play in raising standards in learning across the curriculum, provided teachers know how to adapt their pedagogies in order to maximise the potential gains offered by learning technologies.

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Naace has a network of qualified associates who can support your school. For further information contact: naacepde@naace.co.uk

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Having read this “eGuide”, you may wish to register with The Naace Open Badge Academy for Open Badge CPD accreditation

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