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# The digital (r)evolution in schools

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# Overview

This paper is intended as a briefing, summing up the schools market for IT and the conditions that help to determine it. It draws on a range of sources and places the current situation in a historical context in order to go some way towards anticipating the state of the market in the next few years. The paper is based on secondary research in the main, but also draws on our own, on-going research. We know the schools market intimately and have made observations in this report based on our research activity over the past 12 months, including:

- Over 30 surveys, to subject specialists, senior leaders, primary and secondary school practitioners, SENCOs and users of specific awarding bodies.
- Around a hundred focus groups (of which over 80 have been online) to subject leaders, users of specific schemes and resources and senior staff at schools deemed 'outstanding' as well as those in special measures. Schoolzone have tested new apps, software tools, content, standalone resources as well as multicomponent schemes, speaking to teachers about everything from their finances to their responses to curriculum reform.
- 50 educational product trials, involving over 750 teachers in completing structured tasks both in out of the classroom, assessing the suitability of content, tools, design and pedagogical approach, which they have fed back via in-depth online feedback forms, depth interviews, research forums and face-to-face interviews.

## Budgets and funding

Even before the election, schools are starting to feel the pinch. Most secondaries and many primary schools received a boost from academy conversion and have had greater capacity to manage their budgets through conversion, but many pockets of funding have disappeared in recent years and the current government has not targeted IT provision to anything like the extent that the previous one did. After the election it seems very likely that whichever party or coalition comes to power, public sector spending is likely to be cut further and this time it seems that education will not be spared.

However, the trend for IT spending in schools has been very positive, especially in primary schools, which have, for example, seized the opportunities presented by tablet PCs and have also benefitted from reduced spending on staffing.

Pupil Premium funding contributes the most significant variation in funding between schools, but this should not be seen as magic pot to target for IT funding – it contributes a very small amount (1 – 4%) of schools funding and is generally not allocated separately to other budgets.

## Hardware market

The price of computers has fallen and a switch to iPad minis (for example) is relatively cheap in total cost of ownership for schools with no specialist in-house IT support. This has driven some of the increased IT spending, especially in primary schools and the increase in tablet PCs is mirrored by a decrease in desktops and, to some extent in laptops, too.

Meanwhile, the market for IWBs, which stagnated following the withdrawal of government funding, has not particularly gained ground though they seem set for a new lease of life as a new generation of software to enable better integration of IWBs and mobile devices begin to come on to the market. A limitation of IWBs, teachers tell us, is that they can encourage too much emphasis on front of class teaching, but this greater integration will allow teachers to use pedagogies that are much more akin to their traditional methods.

VLEs are well embedded in schools and seem to be used mostly for administrative purposes (albeit those associated with the classroom), so schools do not seem to give them much attention, nor do they feature in teachers' ambitions for the future. Better

internet access and provision seems to have rather undermined their influence in schools, for example on software purchasing decisions. To that extent, VLEs have moved from being a delivery mechanism for teaching and learning to being a support service, much like the MIS. Providers of both of these types of systems are currently in the process of updating and rebranding their purpose in schools.

Tablet devices and associated apps seem to offer the best potential for the industry at present, but (see below) this is likely to be slower than is generally anticipated.

### Digital content market

With recent wholesale revisions to the entire curriculum in English schools (and at various stages of review in the rest of the UK), it might be expected that there would currently be a major demand for new content, yet there is not – digital or otherwise. Certainly, schools anticipate that they will at some stage need to update resources to reflect the changes, but despite all the angst surrounding Gove's reforms, they will carry on very much as now in most regards, teaching much the same content to much the same level.

A more significant reform is to the process of assessment – significant not only for teachers having to come to terms with the removal of NC levels, but also in that digital software offers some potential for supporting teachers to do so. Many publishers are currently looking at developing such products, but schools are not necessarily looking for them because they tend to think that a very high degree of personalisation and flexibility is needed. So, while this seems to offer the most scope for significant market growth, it is likely to be very fragmented with individual products perhaps finding a toehold in specific segments of the market, as MyMaths achieved.

Moves to online subscription services have been underway for some time among educational publishers and the market now seems set to move in this direction, for curriculum software at least.

### Anticipated market trends

While elsewhere in society there has been a digital revolution, in schools this has been more of an evolutionary process. They still lag behind business in terms of provision, expertise and technical support, but there has been a marked change in the last three years. Where previously schools had focused their attention on school-wide, expensive systems such as VLEs and MIS or on IWBs, they now see a future in tablets delivering the same benefits they see when using them at home. Much of the growth in spending, especially in primary schools, is related to the uptake of tablets, especially iPads, and this is expected to continue to grow, as far as budget constraints allow.

However, this is still a bit of a wild frontier for schools – will the novelty wear off? Will (secondary) schools be too reluctant to abandon desktop suites having invested so heavily in the infrastructure? Will educational apps eventually provide the resources schools are looking for?

Tablet devices receive a lot of attention from those whose main focus is IT in schools: they are a phenomenon unlike any other, with faster growth than laptops, greater familiarity than IWBs, more engagement than VLEs and offering more potential for integrating IT into learning than any previous IT development. So, there is widespread anticipation that the growth will continue but there are some limitations to be overcome before schools will want to replace their desktops and laptops. For example, keyboards, classroom management of devices, reliable access to wireless, processing power, access to apps which directly support learning, and so on.

Tablets are too new in schools for teachers to have become frustrated with some of the limitations and unless issues such as those above are overcome, it seems likely that some of the predictions made by various papers referenced in this report will be realised rather more slowly than researchers expect.

Software though is clearly moving in directions that support tablets and other devices. In particular, the move to cloud based provision means that devices do not need the same memory and can be used both at

home and in school. Alongside this, schools have become much more ready to purchase software by subscription and (wireless) internet access in schools has become much more reliable. This is likely to be a growth area as existing provision becomes redundant and the cost of large-scale replacement is pressured by reduced school budgets.

### Procurement and ordering

The rapid growth of academies, especially in the secondary phase of education, has denuded the power of most LAs to support consortium purchasing. This has affected primary schools in particular, as they do not have enough staff to spend the time administering a protracted procurement process and consortium purchasing is difficult to achieve unless the school can join an existing cluster – many of which have appeared in the last two or three years.

Cluster purchasing is more prevalent in primary schools as a result, though often secondary schools are involved in the same clusters – if only to provide goods storage. Many IT providers now target these cluster organisations for their sales and marketing initiatives, but they are very diverse, disperse and difficult to reach, adding considerably to the cost of sales, compared to the previous, LA-based approaches.

The DfE is currently (effectively) recommending<sup>1</sup> the Crescent Purchasing Consortium as a national, online service to support this approach. Almost 3,000 organisations have joined and, if it markets itself successfully, this is very likely to grow, particularly in areas (mostly outside London) where LAs can no longer support consortium purchasing.

### Purchasing decisions

Many of Schoolzone's research and marketing clients suggest targeting their activities on head teachers, deputy heads, or other members of the senior leadership team and, for large scale IT purchases, these are most likely to be the decision-makers, aided by IT coordinators, network managers and so on. However, at department level, the head of department is usually just one member of a purchasing team. In a great many of the surveys we have conducted, respondents have been asked about their role in

purchasing decisions and the response shows that the HOD is often the person coordinating the decision-making process, but that the whole team generally arrives at a consensus about almost all purchases, other than the most mundane.

The driver for purchase-based initiatives very often comes from a member of the team *other than* the HOD, especially, for IT-related initiatives. A common model is that an individual teacher is inspired, perhaps by a teacher at another school, by a particular strategy, device or piece of software. They try it for themselves, like it, and encourage other members of staff to try it too.

We see this too, in our email marketing for clients: a typical email for a product may yield several thousand responses, but they are no more likely to be from HODs than from classroom teachers.

This model for innovation means that the views of all teachers are important, meaning that marketing teams need to address the needs of teachers at all levels in their messaging, and to segment them in more specialised ways.

In academies, business managers have seen their roles dramatically increased and it is now common for secondary academies – and LA schools – to have their SBM on the senior leadership team, as they are well placed to offer strategic advice in all aspects of school life, since there is always some cost associated.

The SBM is often the member of staff that represents the school on purchasing cluster groups and who oversees major (and often minor) purchasing decisions. They operate at an entirely different level, with a different focus and purpose, compared to teaching staff and require a completely different strategy for sales and marketing.

Overall then, purchasing decisions are effectively largely as they have been for many years, but with the market for larger purchases much more diverse and difficult. Combined with reduced budgets, the focus needs to be more on SMBs than on head teachers, who nowadays have very little to do with such decisions, other than to ratify them.

# (R)evolution

## Context

### A culture of digital learning

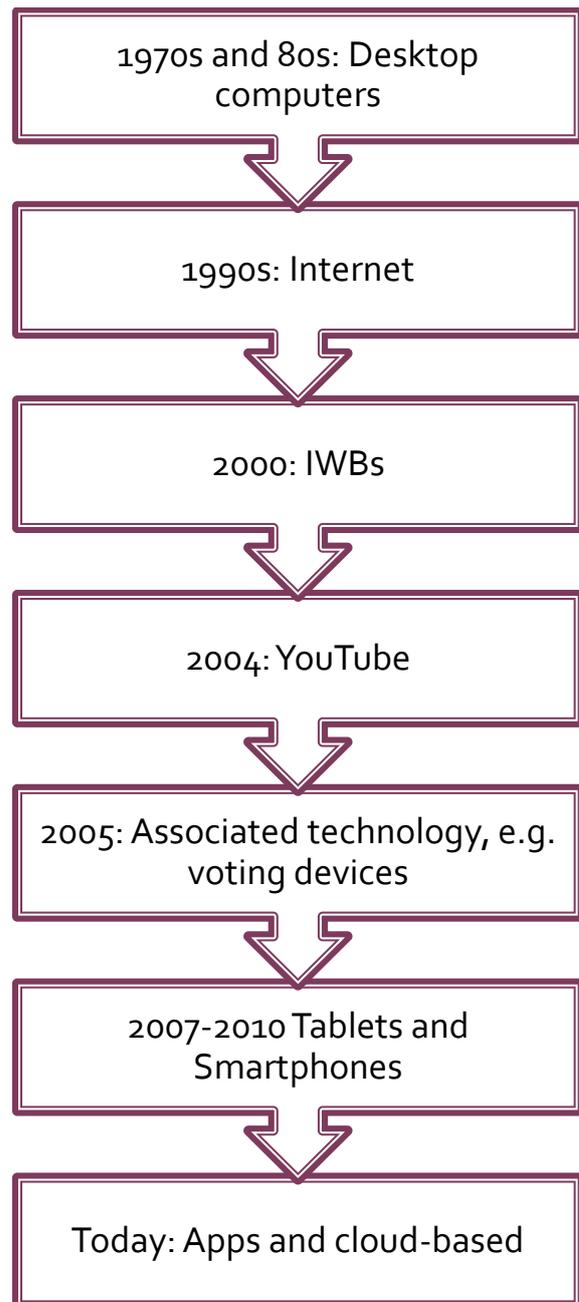
Technology has seen fifty years of rapid development. Schools have struggled sometimes to keep up with the development of computers, the internet, interactive whiteboards and gadgets, and increasingly, tablets and smartphones.

Computing was first introduced into the curriculum in the 1980s and the government has, over subsequent years, advocated and supported the use of technology in schools. Initiatives such as Tools for Schools, Curriculum Online and Wired up Communities have focused spending on technology.

Schools have also prioritised their spending at key points to take advantage of new technologies and initiatives on offer. This was most noticeable under the previous government, when there was a push for computers, IWBs and VLEs. Inevitably this expenditure was not going to be forever and, as the essentials were acquired and budgets squeezed, spending on technology reduced. Schools were reluctant to replace ageing hardware in a bid to meet targets and reduce expenditure. In recent years, the trend has been reversed, despite the removal of government funding designated for IT related use.

Although students may not have great fluency in using technology, it cannot be questioned that the current generation of school children have grown up in a world where technology is embedded in their lives. Together with government initiatives, this has fostered a culture of digital learning that has facilitated the growth of companies specialising in providing digital resources and software to schools.

This raises two questions: **How is technology really used in schools? What is the impact on teaching and learning?**



Timeline of development of technology most relevant to schools and education

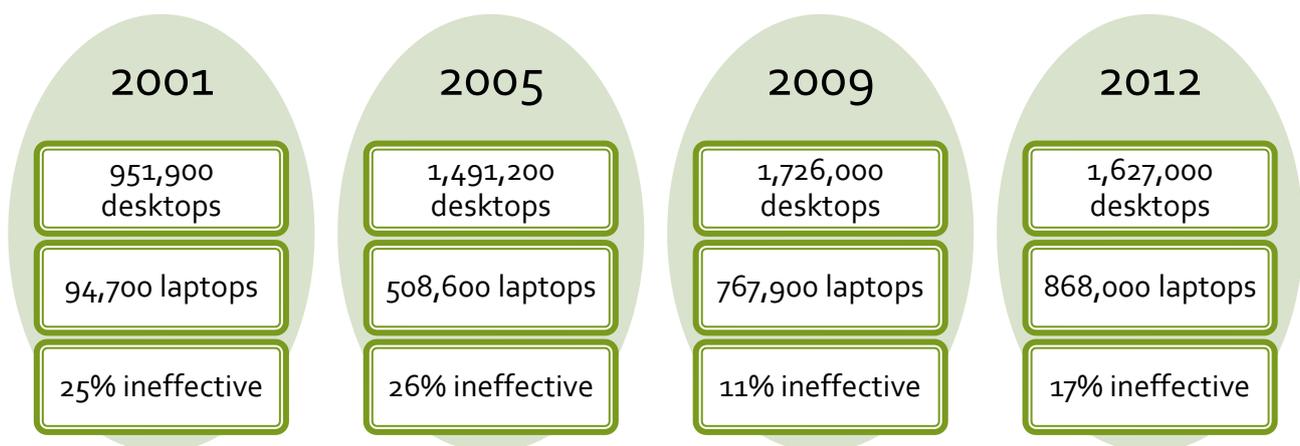
## How is technology really used in schools?

Before being able to answer this question it is important to first consider what schools actually have available for their staff and students. For hardware, this invariably means computers, though it also increasingly relates to mobile devices, and software use corresponds to this.

### Hardware capability

Initial efforts in schools centred round the introduction of desktop computers into schools. However, by 2005 the market in laptops had become more favourable to schools and this led to an increase of over 400% in their purchase. The introduction of tablets, smartphones and other mobile devices has led to a decline in desktops and the growth in mobile computers and devices (both laptops and tablets) looks set to continue.

'Ineffective' computers are those that are out of date and not suitable for teaching the curriculum and although the percentage in schools dropped in 2009, the numbers have risen since then. This is, at least in part, a reflection of changing budgets; considerable expenditure on IT up to 2009 would explain the reduction in the number of computers deemed 'ineffective' but the subsequent reduction in budgets and spending power has reversed this trend.



Source: Report by E-Learning Foundation, commissioned by Syscap plc (2013)

### Primary vs Secondary school behaviours

Primary schools have not been as quick at introducing computers as have secondary schools. This has been explained in some studies as the result of smaller budgets and purchasing power as well as expertise. It might also be the case that different teaching needs and a more cautious approach might be the cause. Either way, it is true to say that primary schools did not maximise the technological advances that are available quite as quickly as secondary schools.

Primary schools show that they are more successful than secondary at implementing whole-school e-strategies, likely due to their smaller size and commonality of approach used (BECTA, 2007). So whilst primary schools have been slower to introduce technology, when they do it tends to be done effectively through a whole-school strategy.

In recent years, primary schools have accelerated their spending, compared to secondary. See: IT spending trends below.

## Wireless Technology

Wireless technology was initially slow to grow given the dominance of desktop computers. However, the increasing appeal of mobile technology and devices necessitated a shift and by 2005, 31% of primary schools and 55% of secondary schools owned wireless networking technology (Syscap, 2013).

iPads now dominate the market for tablet use at schools. In 2013, Schoolzone research revealed that 69% of tablet users were using iPads, compared to the second most popular device – the Kindle, used by just 12%.

Seven in ten children now have access to a tablet at home, up from 51% to 71% since 2013. Smart phone ownership is growing too, and 59% of 12-15 year olds now go online using their mobile phone (Ofcom, 2014). This mobile technology is now starting to be utilised in the classroom, as schools are starting to adopt bring your own device (BYOD) policies – or at least cultures, allowing them to maximise the use of smartphones in the classroom.

In an article about mobile learning in the British Journal of Educational Technology (2014), the compulsory use of mobiles for workplace learning is advocated. The article goes on to raise the difficulties that can arise with saturating the marketplace with apps and programmes, namely students feeling overwhelmed by what is available and ill-equipped to know how to use them appropriately and professionally. It is suggested that schools and higher education institutions should consider how students can best be introduced to the skills they will need to face technology in the modern workplace. It seems unlikely that the trend towards mobile technology is going to reverse and the importance of schools embracing mobile technology, whether school or student owned, is set to become an increasing priority within the education sector.

## Bring your own device (BYOD)

Whether this access to mobile technology at home is currently being capitalised upon in the classroom is unclear. Schoolzone's own research suggests that the majority of schools still do not allow students to use their own devices in school.

This is likely to change in the near future, however, given the diverse and increasing pressures placed on schools' budgets. Some schools are turning to this relatively new possibility, by placing the responsibility on parents to buy a device that their children can use in school (a tablet or smartphone). Unsurprisingly, this is an appealing option for schools, who are struggling to provide a sufficient number of devices to meet their needs. The BYOD scheme does have some disadvantages, such as excluding disadvantaged pupils, a wide variety of device types being used, and health & safety regulations (PAT testing etc).

Schoolzone's 2013 study concluded that there was little scope for BYOD in the foreseeable future as a means of revolutionising the use of IT to support teaching and learning in the classroom; even if there was 100% access to mobile devices in this way, most teachers cannot see enough benefit to overcoming the many potential pitfalls of managing classes using a wide range of devices. Teachers have only recently become comfortable with the reliability of the internet in schools in the main, so it seems likely to be a quite a long time before BYOD achieves any real impact in schools.

In the classroom, teachers need to be able to use technology to achieve much the same ends as they would without it and for it to integrate easily with their teaching. Software developments currently on their way may help them to achieve this and if smartphone costs continue to fall this option may contribute more in the future. We consider that this is unlikely to have much of an impact before 2020, however.

## Are schools using what they have?

In the late 1990s when the internet and technology were gaining momentum in schools, an article by McKinsey (1997) found that pupils were falling short of the full benefits that IT in schools could offer because of a number of issues. They reported that there needed to be more clarity over educational objectives in IT, improved training and support for teachers, more substantial software packages, cheaper internet connections and more up-to-date hardware. Over the last 15 years some of these areas have been addressed and as a result, schools are using the technology that they have more willingly. This is likely to have been aided by the higher status of 'computing' in the national curriculum, the developments in software and apps, more competitive pricing of hardware, and the improved infrastructure in schools to support the internet and more recently, Wi-Fi.

Despite advances in digital resourcing, whether schools are fully utilising what they have is questionable. In 2013, Schoolzone research found that approximately one third of tablet users used them frequently for lesson planning, teaching and classroom learning, Less than a quarter frequently used their tablets for assessment (data gathering and record keeping), and an even smaller proportion (7%) used them for setting homework. This indicates that despite the increased popularity in owning devices, they were yet to become an integral feature of planning, assessment, and class or home based learning.

Although not all schools may yet be using IT resources to their full potential, it is clear that they are becoming more embedded in everyday practices as schools grow in e-confidence. What Becta (2007) noted is that the effective use of IT in schools is more than simply changing resources; it is about changing practices and culture which will see a shift over time.

## Software

The software market in schools was distorted for several years as a result of the previous government's dedicated funding, eLearning Credits, which supported schools in acquiring digital learning content. This led to a rush of newcomers to the market of

variable quality and a surfeit of software in schools. This in turn led to a dramatic drop in purchasing and hence development.

A further though less significant distortion was caused by the push for schools to develop VLEs so that pupils could access school software at home. The sudden growth in broadband and hence cloud based software has shifted the emphasis away from the need for VLEs as a portal to educational software and instead they are mostly used to share information which would previously have been achieved on paper; in other words, their use has shifted from pedagogical to administrative functionality.

Programmes that develop pupils' skills through gaming are becoming increasingly popular because they capitalise on the benefits of engagement and interest. In 2007, Becta research reported the growing trend in educational software developers merging principles and design features from their commercial software into their edutainment resources, such as LTS's 'The Serf's Quest' and the BBC's online curriculum 'BBC Jam'. These intended to deliver learning experiences which embodied video, games, audio and animation. Whilst educational games remain a popular choice for schools, critics are concerned that pupils learn to succeed at the game rather than develop their broader skills and understanding.

The most popular use of iPads (Heinrich 2012), which dominate the market for tablets, is not with a specific type of software or app, but to research topics online (73%). This reveals that integrating web resources into lessons remains the most desirable and useful application of technology.

The second most popular use for iPads was with the software and apps available, notably mind-mapping using the Popplet app, and creating/viewing presentations. A study carried out by Naace (Heinrich 2012) reported that given the choice over whether students preferred to use Popplet or a pen and paper, they preferred Popplet, citing speed, the facility for rapid edits and the ability to share their mind-map as important.

## What is the impact on teaching and learning?

### What evidence is there?

Technology, whether for teacher or student use, has been shown to have a positive effect on learning. Although the evidence is based on previous years rather than current technology or use, the key points are fairly consistent.

The Sutton Trust – EEF Teaching and Learning Toolkit shows that, based on extensive evidence, digital technologies have a moderate impact at high cost. The supporting research, including a report by Durham University on the Impact of Digital Technologies

(2012), says that technology needs to be relevant, have a clear role and benefit and is usually better as a supplement rather than a replacement for other activities.

Training and support are often not considered by schools, either forgotten or perhaps overlooked due to the associated costs. However, given that the benefits of technology rely on its effective use, this is an area that should not be overlooked.

“ Effective use of technology is driven by learning and teaching goals rather than a specific technology: technology is not an end in itself. ”

The Sutton Trust – EEF Teaching and Learning Toolkit, p.12.

“ Teachers need support and time to learn to use new technology effectively. This involves more than just learning how to use the technology; it should include support to understand how it can be used for learning. ”

The Sutton Trust – EEF Teaching and Learning Toolkit, p.12.

The vast range of ways that technology can be used to enhance learning ensures that it is effective for different purposes. Digital video and photography are particularly well suited towards collaborative learning and discussion, and have also been found to benefit pupils with additional needs (BECTA, 2007). The same report found that learning platforms and VLEs were effective for both pupils and teachers in supporting

cross-curricular learning and collaborative activities (BECTA, 2007).

One of the key themes throughout the literature is that, through a combination of different technologies, IT supports personalised learning – in some contexts IT and personalisation have become synonymous. The increase in pupil independence is also a notable benefit.

In 2014, Schoolzone research into the use of social media by primary and secondary teachers found that YouTube was growing fast in popularity for:

- Sharing videos on topics, or those made by students/staff
- Departmental channels to share resources
- Watch videos in lessons
- Music whilst students were working

Twitter was also used by teachers in their professional capacity, although more for following educational issues than for lesson delivery. At primary level, blogging was found to be suitable for engaging with pupils and parents in a secure virtual space.

The use of technology has had a variable impact across different subjects because of the different ways that it can be used to support learning. Naace (Heinrich 2012) reported that English, maths and science lessons were most dominant in using technology, as well as a strong usage in geography. This is likely to reflect the perceived importance of the core curriculum subjects, as well as the software and interactive tools available.

Unsurprisingly, there is a strong relationship between level of device use in subjects and the availability of suitable tools and apps.

## Parents

One of the greatest perceived benefits of technology is the opportunity to bridge home-school learning and increase parental support. This is developing and schools are beginning to realise the benefits of using technology to communicate with parents, albeit slowly. In a study carried out by Naace (Heinrich 2012) assessing the impact of 1:1 iPads subsidised by parental contributions, parents were generally positive about their impact but felt that more could be done to ensure that they understand their educational value. Whilst some parents were concerned that the pupils just used the devices for 'educational games', they also acknowledged benefits of the technology for purposes such as revision, easy internet access and homework.

# Budgets and Funding

## Funding trends

School funding is, of course, determined partly by the economic situation pertaining at the time it is awarded. Governments appreciate that economic wellbeing is influenced by the levels of education of the workforce, so they tend to protect education funding as far as possible. In real terms, education funding steadily rose until the advent of the recent economic crisis; funding was sustained for a period beyond given schools' three year budget.

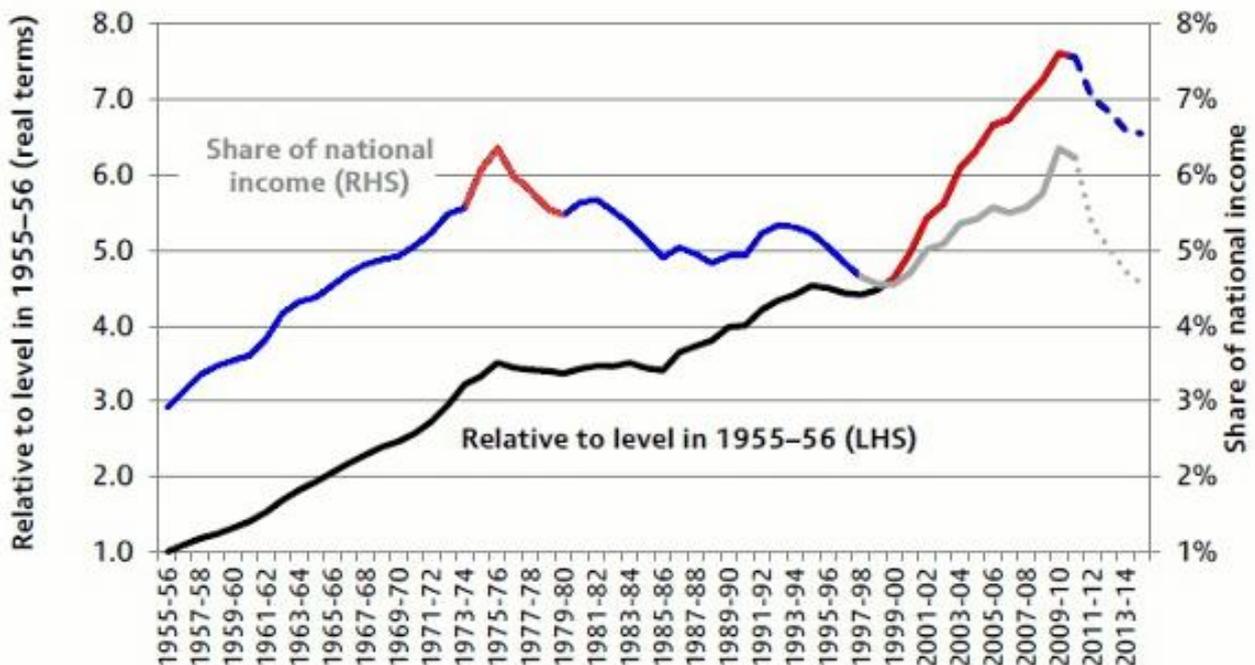
Another way to look at funding priorities is as a share of the national income: governments that see more value to the economy in funding education could be expected to spend more of the national income on schools than those which value it less and spend as a smaller share.

In a 2011 report on trends in education and school spending by the Institute for Fiscal Studies, the fall in education spending as a percentage of per capita

income between 2010 and 2015 was predicted to be the largest since the 1950s (a drop of 13.4%). The increase in the school-age population, alongside the extended time for 16-18 year olds to remain in education, suggest that resources per head would decline by even more than total spending.

Total funding amounts continue to increase year on year, but not in real terms and the future does not look rosy. The chart below gives an indication of the way funding tends to change with the political persuasion of governments, but even a change in power at the May election is unlikely to see anything other than further cuts to education funding.

*Source: Institute for Fiscal Studies – colours added to represent changes of party in government.*



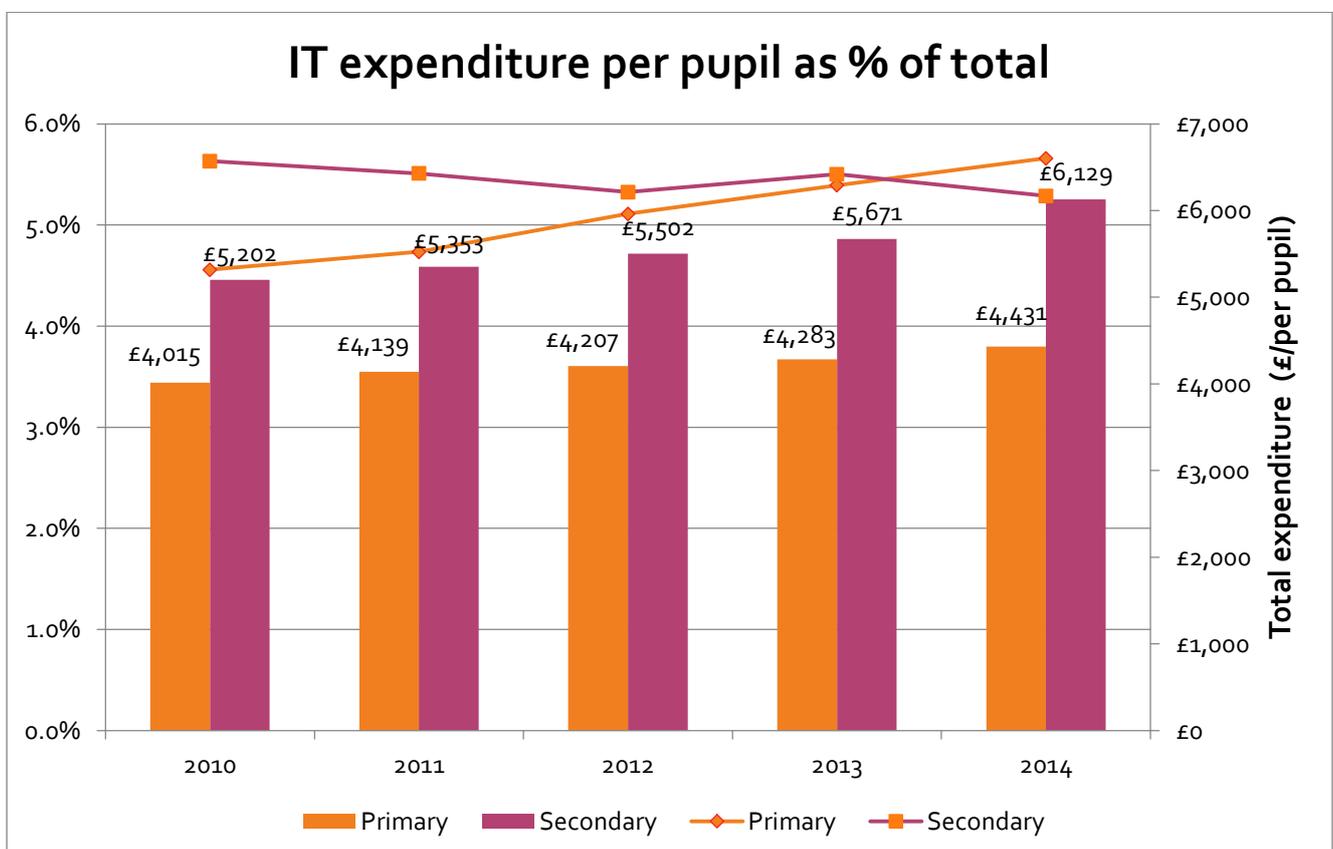
## IT spending trends

The previous government had a funded strategy for IT in schools and an agency to support and advise schools on IT procurement, Becta. However, funding started to disappear in 2008 and as schools' budgets started to dwindle (they were three year budgets then), spending on IT as in other areas began to decline, so that by 2010 they were the lowest in real terms that they had been for seven or eight years.

The previous government's attention to IT had driven considerable change, but it had focused on school level approaches, such as VLEs and MIS systems, or on IWBs for classrooms, which are purchased only at intervals of several years, so once these were in place, schools had little need to reinvest.

Since 2010 there has been a renewed interest, this time in personal devices as wireless has grown and laptops and more recently tablet PCs have captured teachers' imaginations. These devices are much better suited to classroom use than suites of PCs and there has been a clear move in this direction that has driven spending increases: see Hardware, below.

IT expenditure currently accounts for around 5.5% of schools' per pupil spending. According to DfE statistics (2014) spending per pupil on IT has increased in both primary and secondary phases, however, this somewhat masks the true picture. As a percentage of total expenditure IT expenditure has risen quite dramatically in primary schools, but has fallen slightly in secondary:



This suggests that primary schools have placed a much higher priority on developing their IT provision in the last five years, perhaps owing to a lag behind secondary schools and also possibly as a move away from a reliance on IWBs which had their boom period before then. Primary schools were also less likely to develop IT suites than secondary schools so have less current investment locked into maintaining them.

There is also a contrast with spending in other areas: DfE statistics (2014) show that staffing typically accounts for around 70% of total expenditure in schools (slightly higher in primary than secondary owing to smaller school size); this has remained approximately constant in secondaries but has declined steadily (70% of total spending down to 67%) in primary schools. It could be that primary schools are investing some of the savings made (by reducing staffing) on IT and that this is supporting the growth.

In terms of actual spending and growth there are other marked differences between the two phases.

- Since 2010, primary per pupil spending on IT has grown by 75% – during this period, total per pupil spending has grown by 37%
- In secondary, per pupil spending on IT has increased by 11% – during this period, total per pupil spending has grown by 37%.

Per pupil spending increases, 2010 – 2014 (DfE 2014):

	IT resource	Non IT resource	Staffing	TOTAL expenditure
Primary	£28	£39	£150	£416
<b>Growth</b>	74.9%	27.1%	5.3%	10.4%
Secondary	£8	£24	£129	£927
<b>Growth</b>	11.9%	10.2%	3.6%	17.8%

In other words:

- **Primary** IT spending had increased at around **three times** the rate of other resources
- **Secondary** IT spending had increased at about **the same** rate as other resources

Compared to total spending:

- **Primary** spending has increased at over **seven** times the rate
- **Secondary** spending has increased at **2/3** the rate

**Note:** Over the same five year period the cost of IT resources has fallen (ONS 2014), whereas staffing costs have risen roughly in line with the value of the pound. Taking this into account, effectively IT resource growth in primary stands at 79% and at secondary, 14.4%.

## Pupil Premium

Various pockets of funding are available to schools with perhaps the most significant recent addition being Pupil Premium, an initiative designed to help raise the attainment and close the gap between disadvantaged pupils and their peers.

Pupil Premium funding redirects core education funding towards schools with higher levels of children who have in the last six years been eligible for free school meals. With funding cuts being made elsewhere, pupil premium funding has seen a rise with official figures showing a rise from £625 million in 2011-12, to £2.5 billion by 2014-15. This is set to remain the same in 2015-16, except for an increase of £20 per eligible primary school child. In order to overcome the risks of a 'digital divide' for pupils with limited or no access to IT at home, some schools are using their pupil premium funds to supply pupils with a device for use at home and school.

However, most schools tend to use PP funding on staffing and other areas that they were funding in any case, despite various initiatives to ensure that schools were spending it as the DfE intended. A Nuffield funded study (ESRC 2014) reported that PP funding does not achieve the desired impact on the relevant target groups anyway.

In short, Pupil Premium is spread too thinly and does not particularly offer suppliers much hope as a source of IT funding in schools, despite the ambitions of various interested parties to encourage schools to use it in this way:

“ Schools currently receive £900 this year for every pupil on Free School Meals. With tablets costing around £200, just £100 of the Pupil Premium would pay for one year's use and help the school to ensure that every pupil has the same opportunity.

The e-Learning Foundation - Report into the changes in numbers and quality of school owned PCs & laptops, p.11.

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## Value for Money

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Many schools find that iPads offer the best value for money through a blend of brand reputation and competitive pricing, combined with a lower total cost of ownership, compared to desktop computers. This is reflected in its overwhelming popularity compared to similar products from Android and Windows.

When teachers were asked in a Schoolzone survey (2013) what they would like tablets to offer more in, they said: compatibility, group functionality, apps, design features and cost. This reveals that schools want tablets that are affordable, flexible, multi-platform and multi-functional. Ultimately, they want excellent value for money and products that fail to offer on this are less likely to be seen as a worthwhile investment. The difficulty lies with the disparity between the value for money that the most up-to-date devices can offer, and the very high expectations that schools have.

A number of schools which provide students with a tablet now expect a regular contribution from parents to cover some of the cost. This is one way that schools

are overcoming the tight budgets, whilst still providing opportunities to benefit from 1:1 device availability.

Given the high proportion of time the student will spend using the device at home, they argue that this is not unreasonable. However, some parents using this scheme have questioned the value for money that the devices offer (as reported by Naace). The scheme requires parents to lease a costly machine for an extended period of time, potentially for more than one child. If they are unsure of how the devices are used in schools, and their tangible impact on the child's learning, then it is unsurprising that they question their importance. With this in mind, the educational value, and thus the value for money, must be clearly demonstrated to parents participating in such a scheme.

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## Influences

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### Ofsted

There is an association between the Ofsted rating of a setting and the children's likelihood to use touch screen technology for reading, with those from outstanding settings more likely to have access. These pupils are also more likely to use technology for educational activities rather than entertainment, when compared to pupils in inadequate settings (National Literacy Trust 2014). It is unclear whether this is because outstanding schools have the budgets to finance new technology, or whether they are just using it more effectively. Whilst more research needs to be carried out in this field, a key finding of the National Literacy Trust research (2014) was that changing the media used to share stories does not reduce the gap

for practitioners working with different Ofsted ratings and so purchasing technology should not be seen as the solution for inadequate schools.

When budgeting for hardware/software, schools should think further than laptops and tablets and also consider other, more creative applications for IT resources. The effective use of IT spreads further than just the use of computers according to an Ofsted publication in 2012, which demonstrated how a robotic bee, a microscope, a camera and a voice recorder all provided examples of good practice.

“ I love the fact that these resources add a fun factor to learning. It shows IT is not just about computers and IT resources support all areas of learning, not just Knowledge and Understanding of the World. ”

Ofsted, 'Information and communications technology – not just about computers'.

### The 2014 Computing Curriculum

The changes in the 2014 National Curriculum regarding IT have been termed by some a “computing revolution”, with revised learning outcomes for pupils. For primary schools in particular, the changes seem daunting. Among the new requirements for key stage one pupils are:

- understanding what algorithms are,
- creating and debugging simple programmes,
- using logical reasoning to predict the behaviour of simple programmes.

To ensure that these new requirements can be met, schools have taken on the task of reviewing their

hardware/software provision to ensure that it accommodates the new objectives (particularly those relating to coding and programming). It is unsurprising that some schools have found these changes difficult to assimilate, given the lack of central support on the strategic development of IT.

The curriculum changes will have undoubtedly led to increased spending on hardware, software and staff CPD: primary schools forecasted a 10% increase in IT investment for 2014/15, and secondary schools forecasted an 11% increase (BESA research reported in Education Business 2014).

# Procurement and ordering

## Purchasing decisions

Prior to the coalition government's policy to devolve funds to schools, local authorities had considerably more input into their procurement and ordering decisions. This has dropped dramatically (43%) since 2010, as schools have been given far greater control of their budgets, and many have become academies (NASUWT 2012). The result of this change is that most decisions regarding IT purchasing are now made in-house, by either the SMT, an IT expert or the IT department. This has fallen under intense criticism, with many raising questions about the schools' ability to make IT purchasing decisions given the lack of information and support available.

A sharp drop in IT spending (E-Learning Foundation 2013) between 2008 and 2011 has been followed by a steady increase until 2013, which was set to continue. Whilst this can partly be explained by the number of new academies and free schools incurring high upfront IT costs, it may also reflect a growing state of e-confidence amongst senior leaders, who were previously sitting on their budgets. It is unsurprising that school leaders have been reluctant to spend, in case the government made budget cuts again. Whilst they understand that technology has an impact on learning, it comes at a high price, and senior leaders what to get it right.

“ Experts have welcomed the growth as an endorsement of technology aiding learning, but some warned that more proof of what works was required to inform school leaders before they buy.

Technology - Schools say yes to tablet computers as IT spending soars

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# Market trends

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## Hardware

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Having steadily grown their desktop provision to provide suites of computers and small groups of PCs in many classrooms, around five years ago schools made a noticeable move towards laptops – 2010 was the first year in which numbers of desktop computers started to decline (E-Learning Foundation 2013). Then, as tablet PCs – notably, iPads – started to be popular with the general public, schools, lagging behind by a couple of years perhaps, began to move towards adopting them too. Greater wireless access was required in schools in order to be able to make full use of tablets and schools needed a few years to put this in place in order to make the move to tablets. However, wireless access is now much more prevalent and while still not complete (schools are often complex structures spread over many buildings), teachers are beginning to have confidence that they can access networks more reliably.

Since 2012, the growth of growth of tablets has been mirrored by a reduction in desktops and laptops and these devices now account for around 25% of devices in use in schools (E-Learning Foundation 2013), with primaries slightly less, but gaining ground.

Primary schools are a more fertile ground for growth of tablets because, as mentioned above, they tend to be less locked into existing desktop suites than are secondary schools, wireless provision is proportionately easier and cheaper and most importantly of all, it is easier to see the benefits of using tablets in the classroom. BESA data (BESA 2014) also confirms the observation that tablet access, compared to other devices, is growing more rapidly in primary schools than in secondary.

At current rates of growth, tablets are likely to account for 50% of all devices in schools within five years, according to BESA, though this is likely to slow as cuts to education budgets, which have been protected until now, start to hit schools.

The total number of devices in schools is not increasing dramatically though: in primary schools there are around 6 pupils per device, while in secondaries, this stands at about 4.

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## Software

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### Apps

Schools want mobile apps. In many surveys and qualitative studies run by Schoolzone during the past two years, this comes across very clearly; it is always at the top of a list of priorities. This may seem odd, since tablets account for only 25% of devices, but it indicates the level of importance teachers see in mobile devices for the future. BESA data (BESA 2014) also confirms this observation.

At present there are still too few apps to support learning: tablets tend to be used as a tool in much the same way that they are used at home – to take pictures, access the internet and local network, etc. Yet teachers see the potential in tablets for delivering dedicated learning software, for example e-books start to look as if they may become a suitable replacement for textbooks, if they can find their place between textbooks and drill-and practice software.

Teachers like using them in classroom as a 1:1 device, because they can see what pupils are doing and can interact with pupils more easily; laptops and PCs have vertical screens which mean that there is a physical barrier between teacher and pupil, and in order for the teacher to see the screen, the pupil's back must be turned away. Tablet PCs are more like other resources in that they support pupil-teacher interactions.

As the EEF notes, "Evidence suggests that technology should be used to supplement other teaching, rather than replace more traditional approaches" (Higgins et al. 2014 ). Use of suites of PCs tends to result in *replacement*, whereas the use of apps via tablets can be a much lighter touch, and allows better integration with other resources.

## Assessment and drill-and-practice software

The remarkable success of MyMaths is largely down to the fact that it encourages students to complete tasks and supports teachers in assessment of progress. In other words, it enhances the kinds of activities which have gone on in the classroom, and at home, for decades. Teachers, parents and children alike can easily see the benefits of systems such as these and both schools and publishers would like to think that they can replicate this success with other resources in other subjects.

However, there have been no such equivalents as yet and when teachers are asked about their favourite education software, as Schoolzone does routinely as part of our ongoing research, there is no clear winner. When asked what they would want from software, there is no clear answer from teachers. So it is probably going to continue to be the case that different titles bloom in popularity from time to time and that as tablet use grows, delivery by these devices becomes the dominant factor in software choice.

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