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Advanced
Learning

Can technology genuinely reduce teacher workload?
by John Roberts

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The workload problem

Workload is one of the most common factors cited as the reason for teachers considering leaving the profession. In response to significant Government lobbying by teachers and unions in October 2014 the Department for Education launched the Workload Challenge survey. By November 2014, over 43,000 teachers had responded giving their suggested solutions to workload issues.

One of these issues, 'Reduce the need to input data', is a clear issue with technology. Respondents were also asked specifically about 'Unnecessary and unproductive data related tasks' showing a significant dissatisfaction with the burden of recording, inputting and monitoring data.

With specific reference to recording, inputting and monitoring data, 45% of teachers stated that data duplication added to their workload burden. Teachers also highlighted the following two technology specific issues:

- too many sources of information to manage (e.g. email, virtual learning environment, bulletin)

- poor/unreliable Information and Communication Technology (ICT) equipment and lack of software training

Not only do the survey results clearly highlight the issues with teacher workload, through day to day interaction with teachers in distress at Edapt, we hear workload as the main cause of staff sickness due to stress. Quality teachers and teaching have more of an impact on pupils than any other factor and if we're to recruit and retain a healthy and motivated profession, we must tackle these issues head on in collaboration with all stakeholders.

Citing what works well, teachers responded that the 'use of specialist software for marking, tracking and data requirements' was a solution to reducing workload. Alongside a combination of sensible Government policy and school leadership focussed on prioritising workload, it's clear that well designed education technology also has a role to play in this.

The role of technology in education

Learning Technologies

"Digital technology has great potential, but we are not yet reaching this"[1]
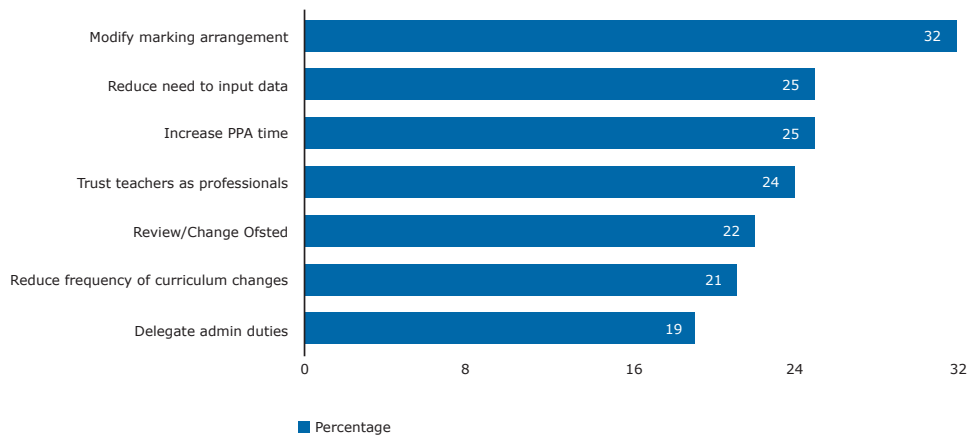
-Oliver Quinlan, NESTA

Education has not kept up with many private and public sector industries in its effective deployment and use of technology. The consumer technology we use daily, both the hardware and the software, generally outperforms that which is available to education. With UK schools spending on ICT at £600m per year [2], this poor performance is not because the budgets or the market is not big enough.
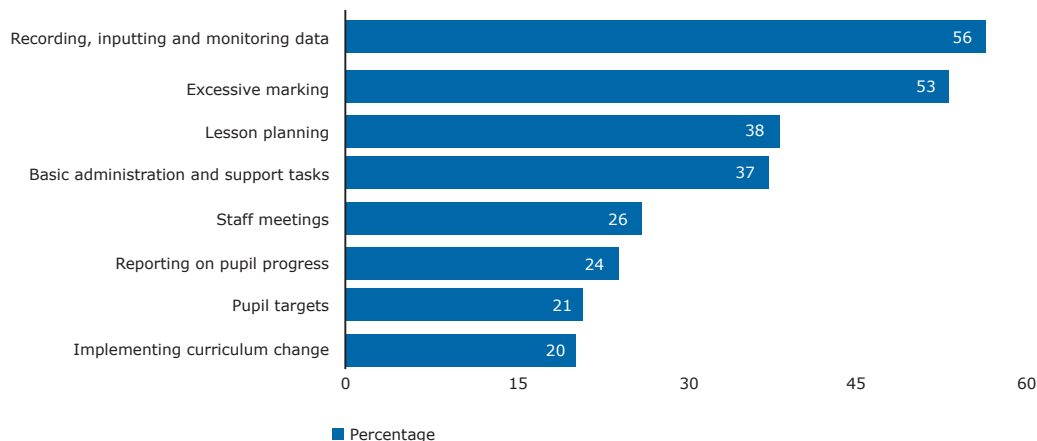
In September 2015 the Organisation for Economic Co-operation and Development (OECD) published the report "Students, Computers and Learning: Making the Connection" and the headlines ran: "Computers 'do not improve' pupil results."[3]

This will come as little surprise to many teachers who will recognise that a 'technology first' approach to computer use in lessons will not simply improve outcomes in and of itself. However, the OECD study focussed only on the volume of use of computers, and not how they

Suggested solutions to workload issues

Category	Percentage
Modify marking arrangement	32
Reduce need to input data	25
Increase PPA time	25
Trust teachers as professionals	24
Review/Change Ofsted	22
Reduce frequency of curriculum changes	21
Delegate admin duties	19

■ Percentage

Unnecessary and unproductive data related tasks

Category	Percentage
Recording, inputting and monitoring data	56
Excessive marking	53
Lesson planning	38
Basic administration and support tasks	37
Staff meetings	26
Reporting on pupil progress	24
Pupil targets	21
Implementing curriculum change	20

■ Percentage

were used, nor how the technology was applied to impact upon learning.

The evidence of the positive impact of learning technologies on student attainment is limited. However, NESTA's Decoded Learning programme has found supporting evidence that learning technologies have a positive impact, but only when the technology is well applied within pedagogy. When based on 'learning first' approach, there is proof, potential and promise for learning technologies to have a measurable and positive impact on learning. Only further significant funding, and research and development, based on this 'learning first' approach, will enable learning technologies to show measurable correlation between correctly applied technology and impact.

Whilst limited evidence is available to support learning technology as a replacement for the traditional models of teaching, arguably the most effective way to use technology to improve learning is to develop the tools for teachers to optimise the information flows they have access to. This allows them to spend more time doing what they're best at, teaching.

Workflow and administrative technologies

"Senior Leadership teams applying technology that reduces workload is not top of the agenda. SLT tend to use technology to appear cutting edge and innovative."
– Joe Kirby, Assistant Headteacher

The source of dissatisfaction with data management has three general causes:

- Government policy
- Senior Management policy
- Poor software design

Government has demanded more and more data entry from schools, which has diffused down in many cases to become a requirement for manual entry by teachers.
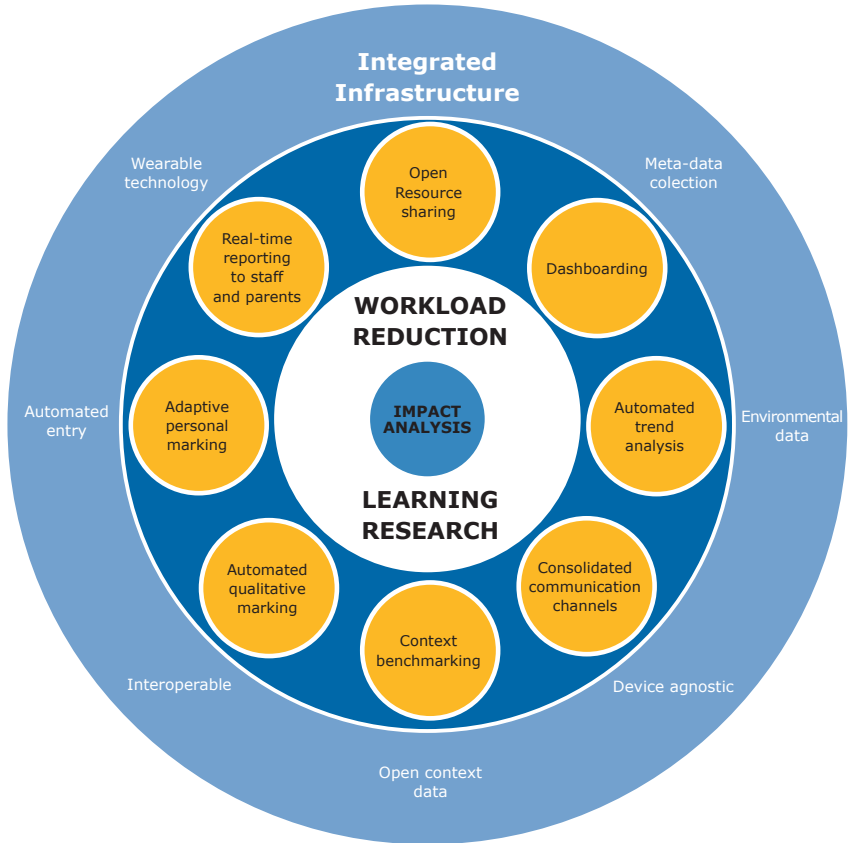
"By starting with the decisions that need to be made, only data that support the particular inferences that are sought need be collected." [4]
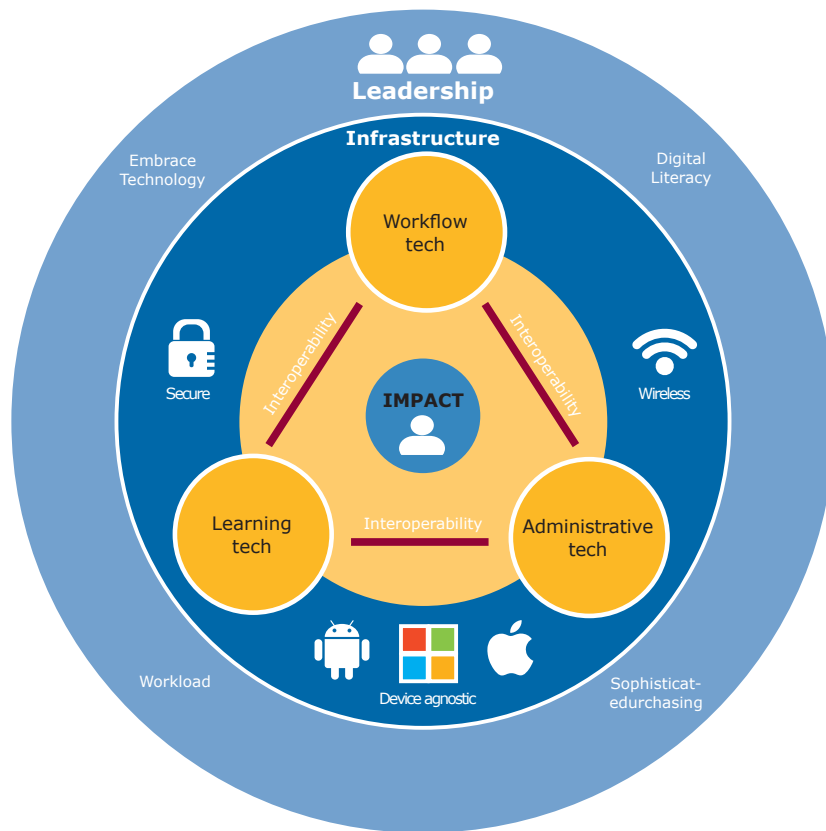**– Professor Dylan William**

A lack of focus by Senior Management on decision driven data collection will lead to a 'collect as much as possible' principle. These overburdening demands when met with poor implementations of

technology, and a lack of digital literacy to use technology effectively, lead to manual data input duplication and 'data drowning'. However, this poor implementation is not solely as a direct result of Government and school leadership policies.

School Management Information Systems (MIS) have glacially evolved since their early beginnings in the 1980s. As systems originally designed to reduce the reporting burdens of teachers, alongside policies which dictate larger amounts of data to be collected, MISs have evolved to become complicit in being one of the main frustrations causing data related workload. Their development focus on breadth has meant that a focus on the needs of the actual user has been left behind.

The diagram shows concentric circles with "Leadership" at the top, containing "Infrastructure". Surrounding labels include: Embrace Technology, Digital Literacy, Secure, Wireless, Workload, Sophisticat-edurchasing. Inner circles are labelled Workflow tech, Learning tech, Administrative tech, connected by Interoperability, with IMPACT at the centre. Device agnostic is shown at the bottom.

Capita SIMS holds an 83% share of the school MIS market. With a single provider almost monopolistically dominating this market, disruptive education technology innovation has been stifled. As the business world moves over to the cloud, the emergence of disruptive marketplaces based around core data sets, with rapid on-boarding have driven the rapid efficiencies and explosive growth of start-ups, and innovative companies, globally.

A lean start-up can now develop and deploy a cloud based, software and data ecosystem in a matter of hours, using complex, yet intuitive, applications however, the deployment of any software into an education setting can take many months. Of course, privacy and security are incredibly important issues, but this is not an insurmountable challenge with appropriate regulation and standards of compliance.

Schools whilst having different needs to business, are not sufficiently complex that exceptionally well designed workflow tools cannot be developed to support schools' needs, and the market spending is large enough to support far more substantive innovation. Wearable technologies, personal low cost devices, software as a service (SAAS), interoperability and automatic meta data collection have enormous potential to dramatically reduce the workload of teachers. The ability to create such technologies is now reaching maturity, but the provision in education is still lacking. The diverse ethos and cultures of individual schools only further confirm the need for a true software marketplace.

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Multi Academy Trusts (MATs) have a clear requirement for internal data sharing, benchmarking, and warehousing yet existing MIS solutions haven't delivered, driving MATs to begin taking such development in house.

We must have higher expectations of technology providers in education.

Defining the direction

"Education has the 'radio on the TV problem'. When televisions first appeared, the programmes just showed someone sat down talking to the camera as if they were presenting on the radio. Education has the 21st century equivalent problem. We have the devices, but not the quality content to make the most of them."

Antonio Gould, Product strategist (Teach Your Monster to Read)

Opportunities to reduce workload

Quality data enables us to learn more about what we know, and also what we don't know. To increase impact and enable our understanding of learning to improve, we must enable the collection of more data automatically. Education will need a pivotal change to reach this, including a sector wide embracing of technology and improvement in digital literacy, to enable this without significantly increasing workload.

Imagine a world where, as a teacher, your register is automatically taken, learning adapted to the individual needs of classes, formative and summative marking collated automatically then calculated and reported to you, the behaviour and attainment trends of your classes available in real time, pastoral issues automatically reported, all while aggregated research analysis improves our understanding of learning. This is not beyond possibility; this should be our understanding of learning. This is not beyond possibility; this should be our expectation.
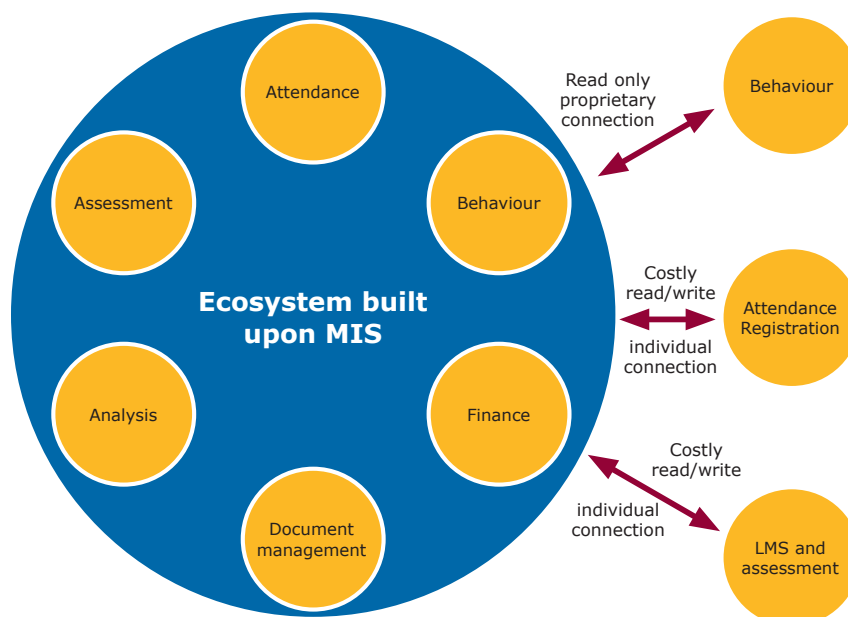
The existing MIS ecosystem
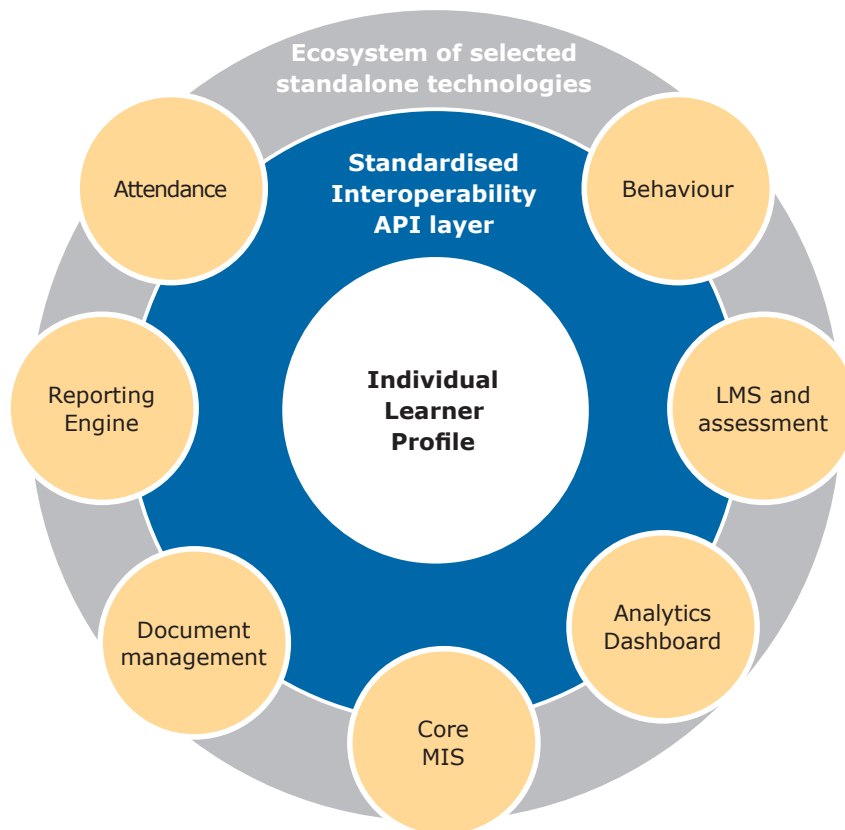
An interoperable, marketplace based ecosystem

Creating workload reducing solutions

What does good implementation look like?

The goal is to create solutions that build an integrated ecosystem of communication channels that feed content, resources, data and analysis that drives quality learning; stimulates directed conversations and scaffolds effective pupil relationships. Importantly, this must happen whilst reducing the administrative burdens of teachers and facilitators.

The opportunities for edtech to reach this goal rely on a number of significant factors:

- **Digital Literate Leadership**
- **Stable Infrastructure**
- **User Centric Design**
- **Interoperability**

Collecting everything but inputting little

The duplication of data entry has no place in the technological age. Senior Leadership teams must focus on implementing the most basic technology and in school processes that remove any requirement for duplicate manual entry.

As an initial move towards an integrated ecosystem, by implementing single purpose systems such as attendance tracking based on wearable or contactless technologies, data entry points are automatically removed. However, data collection must ultimately move far beyond this.

For increased understanding of pedagogy and the variables which impact education we must move towards information
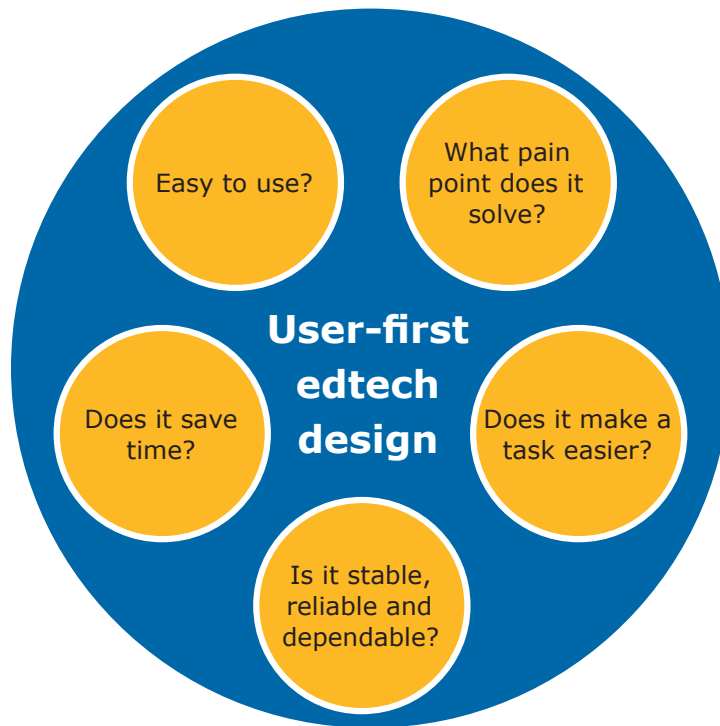
systems which automatically collect the meta-data of students and classes: the environmental data, timetable structure and health statistics. Analysis of this data can only be done algorithmically and at scale, and only if it is collected automatically through integrated and interoperable systems.

Interoperably working together

"By 2016, a quarter of respondents are likely to continue to record that digital content is not always available to teachers due to capacity and technical issues." [5]

BESA, 2015

Education data currently exists in disparate silos. Despite schools and individuals having ownership this data is effectively seen as the asset of Management Information Systems. The monopolistic nature of MIS provision and the non-trivial and costly methods of integration have stifled innovation.

As MIS provision has moved away from simple core administrative needs, providers have modularised their provision into many areas of the school. However, modularisation within a single MIS product is unlikely to meet the needs of all schools. Yet, despite schools being the owners of the data, the power of marketplace based integration into other, rapidly deployable applications, is not accessible by schools. Access to their data is, in general, effectively controlled by MIS providers as it is limited by the cost, methods and extent to which they make such data available to third parties.

The inability for innovators to access these data silos easily creates significant challenges for development, sales and deployment. Having a solution to simply access the data to automate the pupils registered to a particular class or form is not trivial and is disproportionately costly in development in relation to its complexity.

Learning management systems and single purpose applications cannot work in isolation, without access to core student and administrative record data.

Until we move to a data model with interoperability at its core, innovation will be stifled. Disruption here, whether through regulation, or through strategic technology deployment, is long overdue. Well documented, easy to access, low cost, secure APIs should be a focus of any MIS provider wanting to support innovation and improvements in education technology provision.

Only after a move towards an ecosystem of interoperable, single purpose applications and technologies will we enable innovation in the market and allow schools to select tools which fit their specific technological needs.

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Driven by impact and User-Centric design

"I want us to set the bar really high when it comes to education technology -- both in its development and its implementation. I don't think it's too much to ask. I mean, we're talking about teaching and learning here."[6]

Audrey Watters, hackeducation.com

Since the mid-00s integrated cloud workflow tools such as Google Apps, Dropbox, Evernote, Slack and Trello have grown rapidly in from seed ideas to, in some cases, products with over 100 million users.

All of these solutions rely on one thing to grow their user-base. Quite simply, if they weren't so easy to use, they wouldn't thrive. If we couldn't understand their purpose, 'on-board' into the application quickly and integrate them easily into our lives, we just wouldn't use them. We must have higher expectations of technology and quality design to ensure tools are created that we actually want to use, rather than have to use.

Developers must work directly with teachers, not data administrators, to streamline workflows and reduce the burden on data collection. Simple user experience design elements, such as reducing the number of user actions required to input data, have a multiplier effect on the likelihood of retained and effective use of a product, yet many existing products and implementations fail to do this.

Removing the barriers

For Schools

Embracing technology

1. Accept technology has a role to play in learning and in supporting staff

2. Approach technology with the same enthusiasm as your pupils

3. Become digitally literate, take ownership

4. Build the technical infrastructure that allows technology use to thrive

5. Build a culture of innovation at all levels

Purchase with sophistication

1. Don't accept mediocrity

2. Would staff use the product out of choice if you didn't require its use?

3. What clear operational or workflow problem does it solve?

4. Does it save time?

5. Does it integrate with existing software and hardware?

6. What is the opportunity cost and the professional development requirement?

Minimise and optimise in order to maximise

1. Never enter data twice

2. Reduce manual data entry to a minimum

3. Ensure decision-driven data collection where manual entry needed

4. Automate all reporting where practical

5. Condense communication into consistent channels

For Developers

Collaborate for impact

1. Don't silo data

2. Interoperate and integrate – offer APIs

3. Build in the ability to evaluate impact

4. Work with teachers from day one – develop in schools

5. Open license your content

6. Collate meta-data (within acceptable privacy standards)

Optimise workflow

1. Create exceptional UX/UI and service design

2. Where data entry is needed, never make a teacher's task more inefficient, the 2-click task principle

3. Simplify aggregated data dashboards and displays

For Government

Regulation and Standardisation

1. Incubate an edtech sector innovation body to lead on standards, marketplace reform and digital literacy in schools

2. Support sector development of gold standard security and privacy standards specific for education data

3. Catalyse MIS interoperability through census standards frameworks

4. Ensure innovation is allowed to flourish through regulated procurement

Infrastructure

"36% of primary schools still expect pupils to have poor internet access by 2016."[7]
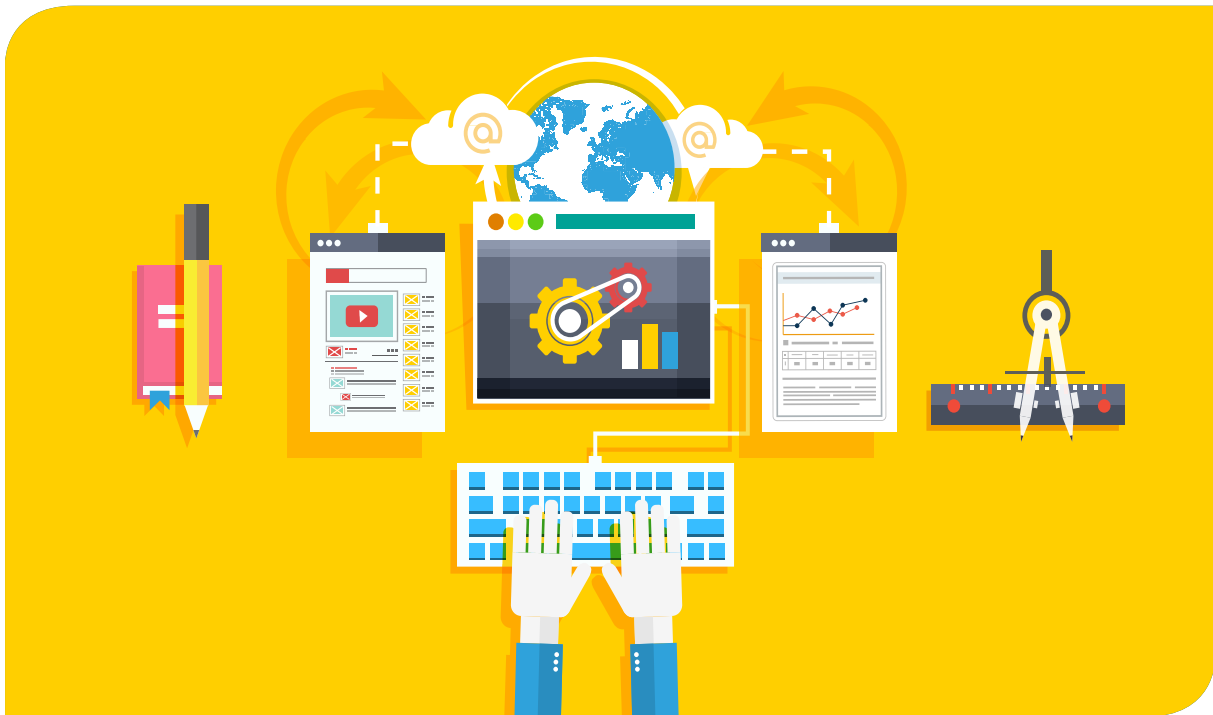
BESA 2015

1. Ensure high speed broadband for all, both at home and school

2. Ensure all teachers and students have access to quality devices

Can technology genuinely reduce teacher workload?

Technology in education is changing, the foundations of an innovating market are appearing, but it will not be a rapid revolution until there is a significant shift in digital literacy, infrastructure and interoperability. Without those the next generation of edtech will not revolutionise pedagogy any more or less than the last. However, given a move towards those priorities, we could much sooner create major opportunities to optimise the workflows in schools. Workflows which currently cause damaging and unnecessary increases to teachers' workload and wellbeing. Only then will we be able to make the next shift towards wider implementation of learning tools that truly impact upon delivery of pedagogy.

Education must embrace the implementation of technology, but we should in parallel challenge the existing monopolies, focus on driving impact, and raise our expectations of what technology providers can deliver to accelerate learning and decrease workload. Only then will we be able to realise the potential benefits of technology embedded in education.

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About John Roberts

John is CEO of Edapt, which provides non-union legal support and protection to teachers. John also works with a variety of edtech companies and charities providing strategy consultancy.

During a break from entrepreneurship, John became a graduate of the Teach First programme in 2007 in Manchester. After a year of teaching John joined the Senior Management Team under the role of Director of Standards holding responsibility for school wide data and assessment and performance management. Unsatisfied with the existing Management Information Systems and the software available in the classroom, John developed tools to interoperate with existing management systems and streamline behaviour management. These tools were mentioned in subsequent Ofsted reports as "enabling pastoral leaders to monitor very effectively students' successes and areas for development" and the products went on to become commercial and investment backed.

@johnrobeds | https://johnroberts.me

About Advanced Learning

Advanced Learning provides management solutions, Facility and Progresso to schools around the world. By basing its solutions on the latest cloud technology and appreciating the ever-changing nature of education, it works with its customers to deliver systems which are primarily focused on learners and improving outcomes for them.

To get an insight into this approach and to learn more about the work Advanced Learning is doing with some of the UK's leading schools, please contact us on 0330 060 2199 or learning.enquiries@advancedcomputersoftware.com