

Naaace
The Education Technology Association



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About Advancing Education

Advancing Education' is a leading journal comprised of an eclectic mix of academic and action research papers and reports from members, sponsoring partners and other expert guests on the innovative uses of digital technologies in education. As such it reflects the wide-ranging interests of members and sponsors and all those passionate about Edtech in all phases of education. The journal is published online twice a year.

Editorial

All our authors are asking key questions in this edition of the Naace journal: questions that we hope will help our members to pick their way through the edtech minefield.

Let's start with some good news. Many of us in the edtech world think that Damian Hinds, the Education Secretary is the first minister we have had in a long time who understands the role of edtech in schools. Strange that he chose August to articulate in the Daily Telegraph the five key opportunities that he suggests the technology sector consider to create a step-change in education, improving teaching methods and slashing workload. Maybe he thought teachers might have time to read an article in the summer holiday?

Bob Harrison mentions this point in *Don't Look Back In Anger? Really?* Bob, a much respected commentator on edtech matters is Vice Chair of Governors at Northern College and a Governor of a Trafford school. In his piece, indicates how pleased he is that edtech is receiving some political attention, but why, he asks, have we had to wait so long for political support and how much has been lost in the meantime?

Chris Yapp, an independent consultant in Futures and Innovation has 30 years' experience in Educational Technology. The question he asks is, *Can You Replace A Teacher With A Robot?*

He goes on to quote the standard answer 20 years ago, which was, "Any teacher who can be replaced by a computer should be replaced by a computer".

Developments in big data, artificial intelligence and machine learning are impacting on other professional disciplines. Indeed in medicine, diagnostic systems can outperform skilled clinicians. But have these new development had any impact on the teacher's role?

Mal Lee, an edtech consultant in Australia and Roger Broadie, a UK consultant are engaged in writing a book about how children use digital technologies at home contrasted with school. Mal and Roger are well known for their critique of the ways in which schools approach innovation. The question they ask is, *When will teachers display the same digital proficiency in schools as so many*



families boast the home? This proficiency has to do with what the young at various stages of life want to do with the digital in their daily lives at the present moment- rather than what the 'experts' believe should be mastered for future application. They also comment that the young don't see the need to learn only in one physical place, a school, unlike governments and schools that remain site fixated. Which leads us well into the next article.

Richard and Allison Allen, who run an edtech consultancy company called Outstream, have been looking in the design of physical and digital learning spaces: *How can the design of physical and digital learning spaces impact on learning?* In fact, the recent concentration on digital spaces for learning has led to consideration of the impact of the physical spaces as well and they ask why teachers have not been engaged in the planning of spaces that so intimately affects pedagogy. As they point out, planning learning spaces is complex - where this process used to involve providing places for quiet, individual concentration, today it means creating more places that accommodate a wide range of activities, technologies, and participants - both physically and virtually. In particular they refer to some ICT Mark assessment reports that provide evidence of how the

use of learning spaces and the attendant technology changes the way pupils and teachers interact.

The final article asks the question, 'How does a learning company use research effectively?' I've written this with Vesna Belogaska and Graham Newell from IRIS Connect to explore the research background of a company that intends to learn from teachers in order to improve their product. The research and development reputation of a company is more important than ever now that the government agency, Becta and the local authority advisory services have largely closed down. School leaders now have to negotiate with the edtech industry directly. How are the schools to know whether a company is truly committed to the ideals of education or just looking to 'make a fast buck'? Sometimes research funded by companies is too self serving: glowing about the perceived value and silent on the issues. A learning company, on the other hand, will always want to understand how their product fits into the school system as well as being committed to improvements. The directors will invest because ultimately the product or service will benefit. Yes better sales may be the result but in the context of a learning need.

So I am ending with good news too. There are many more examples of edtech companies who want to make a difference. Genuine partnership between educators and industry can only strengthen teaching and learning in my view.

Enjoy your read.
Christina Preston



[Credit: Naace CC BY SA](#)

Dr Christina Preston

Dr Christina Preston, Associate Professor of Education at De Montfort University, has been at the forefront of EdTech for over 25 years. Christina is proud of her Naace Lifetime Achievement Award and has also won 4 other international awards for her contribution to education innovation in research and in practice based professional development programmes. <http://bit.ly/2aMfoLo>

Christina was assisted in the editing by Rob Ellis, Design and Layout; Theo Kuechel. MirandaNet Senior Fellow.

Don't Look Back In Anger? Really? - Bob Harrison

This article first appeared in SecEd on 5 September 2018

We have seen eight years of government failure to support learning with ICT – a period of neglect and a failure of political leadership and vision. Now, it's the words of John Osborne that ring true rather than those of Oasis, says Bob Harrison

While the education community – pupils, heads, teachers, governors, support staff – enjoyed a well-deserved summer rest away from the workload and the challenges created by reduced budgets and teacher shortages, education secretary Damian Hinds chose the middle of August to announce in the Daily Telegraph his epiphany about the transformative potential of technology for teaching, learning, assessment, and teacher workload.

Here is what he said: “I've been fortunate enough to see technology being used in revolutionary ways. Students are able to explore the rainforest, steer virtual ships or programme robots from their classroom, while teachers are able to access training, share best practice with colleagues and update parents on a pupil's progress without being taken away from their main focus – teaching.

“Schools, colleges and universities have the power to choose the tech tools which are best for them and their budgets. But they cannot do this alone. It's only by forging a strong partnership between government, technology innovators and the education sector that there will be sustainable, focused solutions which will ultimately support and inspire the learners of today and tomorrow.”

He identifies five key opportunities for the technology sector to create a step-change in education, improving teaching and slashing workload. These include developing innovative:

- Teaching practices to support access, inclusion, and improved learning outcomes for all.
- Assessment processes, making assessment more effective and efficient.
- Methods for delivery of teacher training and development by upgrading educator support so they can learn and develop more flexibly.
- Administration processes to reduce the burden of non-teaching tasks.
- Solutions to lifelong learning to help those who have left the formal education system to get the best from online learning.

Support for technology?

Some have greeted Mr Hinds' comments as welcome and long overdue. However, it does not seem 10 years ago that I was a member of the Becta Advisory Board (remember them?) sitting in the boardroom in Coventry discussing the next iteration of the Government Harnessing Technology Strategy, which Becta was responsible for delivering with a grant of more than £80 million a year.

The meeting coincided with David Cameron MP speaking at the Conservative Party Conference in Manchester, and soon the Blackberry phones of the Becta top brass were vibrating off the tables. Apparently the prime minister in waiting had mentioned Becta (although he had difficulty pronouncing it) in his speech. At first this seemed a welcome intervention until it became apparent that Becta was at the top of a long list of quangos about to be shut down.



Credit: Simon Finch ©

At that time we also had the Building Schools for Future programme, a £45 billion project to transform the secondary school estate to create learning environments fit for the third millennium. And £4.5 billion was ring-fenced to spend on ICT to ensure our children would be digitally literate, skilled and qualified for the digital economy and the world that beckoned. The coalition government scrapped it.

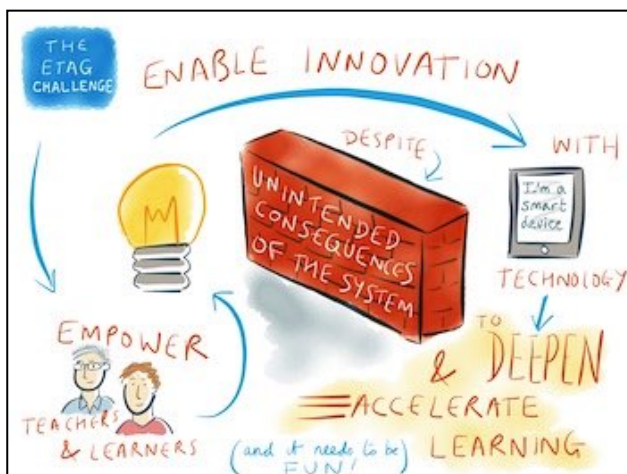
At that time most local authorities had teams of ICT specialist advisors and technical staff, (remember them?), to ensure schools were supported on their digital journeys.

Schools could also call on the expertise of Regional Broadband Consortia and “community of practice” membership organisations like Naace to give them guidance and support.

We also had a schools minister, Jim Knight (now Lord Knight), who had ICT in his job description. He knew his brief and even used ICT with learners and teachers in his presentations to education audiences. He walked the talk, as they say.

Dwindling support

So how did we get from that position to where we are now, with pitiful leadership and still dwindling support? Mainly through neglect and a failure of political leadership and vision, driven mainly by an ideology which resonates more



Credit: [Bryan Mathers](#); CC BY ND

with a 19th century view of teaching, learning and assessment than one that will prepare our children for the challenges of a digital world.

The only government intervention on the ICT issue has been the mishandled curriculum reform of ICT to computing which has resulted in a dramatic fall in the number of pupils studying computing or IT-related qualifications (SecEd, June 2018).

There was a brief glimmer of hope when in 2015 the government-commissioned Education Technology Action Group (ETAG), chaired by Professor Stephen Heppell, produced its report and recommendations for the commissioning ministers – Gove, Hancock and Willetts (remember them?). Sadly this never saw the light of day as all three were shuffled and their replacements promptly buried the report.

However, many confident schools ignored the lack of interest and support from politicians and the Department for Education (DfE) and just got on with it. The technology industry has also been active on the ground and the big names have been supporting CPD for teachers through their Ambassadors, MIE Experts, Distinguished Educators and similar programmes. Not to mention the “free” software, storage and support from the big players.

It appeared that things were starting to move when Justine Greening MP arrived at the DfE and asked civil servants: “What are we doing about educational technology?” Of course there was a stony silence from schools minister Nick Gibb, well known for promoting paper textbooks from a very “techno-sceptic” perspective.

To her credit Ms Greening established a small but young and talented team of civil servants and set them to work. I was happy to give them the benefit of my doubt and arranged meetings with some of my professorial friends and

colleagues at Stanford University who specialise in this field. They organised a set of roundtable events with teachers, technology companies and academics.

Hopes rose but were ultimately dashed when Ms Greening refused to implement the expansion of grammar schools and had to resign.

Back on the agenda?

Step forward former grammar school pupil Damian Hinds to fill the breach as education secretary and the DfE’s “ed-tech” team members held their breath. Apparently Mr Hinds is a convert and educational technology is back on the agenda?

Well, like many others, he knows how to string buzz-words such as “AI”, “big data”, “teacher workload”, “jobs that haven’t been invented yet” and suchlike into his presentations to give a semblance of being savvy about ed-tech – but what about the pedagogies technology can support so well? Nothing has been said.

However, Mr Hinds has been very quick to find £50 million to fund the expansion of grammar schools, but not a penny for ICT. That speaks volumes for his priorities so forgive me if I am somewhat sceptical when reading his August epiphany about technology.

And even if he has seen the light, he seems to be passing the buck to the industry rather than taking the lead.

View from the ground

Paul Haigh is a headteacher in Sheffield and has worries for the future: “I am headteacher of one of the ‘lucky’ schools that had a huge injection of hardware from BSF,” he explained, “but now I’m left with a legacy of ageing kit on its last legs that I can’t afford to replace.

“The estate of computers is being shrunk, so we are focusing on providing a great web-based virtual school for the students to capitalise on the ever-more impressive consumer technology in their homes when studying away from school.

“The use of IT in school is likely to decrease as the funding worsens. Thoughts of revolutionising learning with technology in the classroom are now nostalgia from a previous part of my career where my work won national awards. My focus as headteacher is how to live through the worst funding I’ve seen in 21 years of teaching and save as many jobs as possible while maintaining standards.”

What the future holds

So, are schools in shape for the next generation of children? My six grandchildren will leave school between 2025 and 2036.

Consider the developments in technology you have experienced in the past two years and then “fast-forward” to 2036? Do you think schools will have the infrastructure, capacity, workforce skills, curriculum, assessment, inspection and accountability systems in place to have met the expectations of these children?

My best guess is there will no longer be out-of-touch ministers urging them to carry heavy textbooks, cram their heads full of time-based facts, develop exam techniques useless outside of schools, and sit in serried rows of desks. Printers (even 3D), projectors and interactive whiteboards will be relegated to “so what” status. Students will only know technologies appropriate to their learning – and this will keep changing.

They will expect screen-based technology, touch and gesture-based computing, voice-to-text and text-to-voice software, augmented and virtual reality, blended learning and instant feedback, online formative and summative assessment and will be familiar with artificial intelligence, machine learning and be able to own and see their own progress data.

That doesn't mean that they, like us, won't be familiar with the paper, pens, pencils and erasers and whatever else is appropriate when the tech is not.

So what are the challenges for schools and colleges if teaching learning and assessment are to remain engaging and relevant to their needs?

Well it will take a lot more than a short column of fine words and appeals for help from technology companies in the Daily Telegraph, believe me.

There was a time when we expected educationists, supported by policy-makers and politicians, to come up with the answers. And that remains the best bet for securing our future.

The popular Oasis anthem suggests we “don't look back in anger”, but after years of witnessing abject failure to support our children and move education forward I am more inclined to go for playwright John Osborne's version: “Look back in anger.” Much more appropriate.



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education. He was a member of the Ministerial Education technology action groups feltag and etag. He is a judge for the TES FE awards, The Bett awards, E-Assessment awards and the Learning Reimagined awards[a].

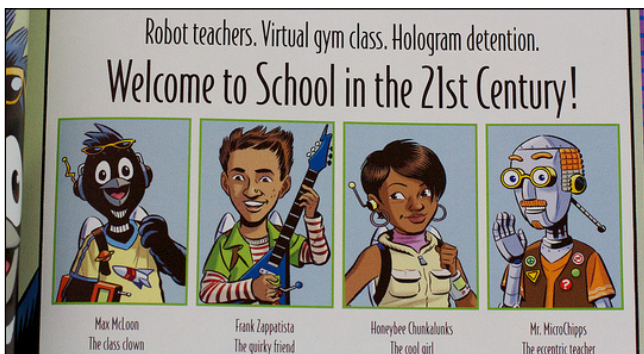
* Bob Harrison is a former teacher, lecturer, principal and is currently chair of governors of a college in Barnsley, governor of Oldham College and vice-chair of a secondary modern in Trafford. He was a member of the ministerial action groups ETAG and FELTAG. He is an assessor for the Stanford University Graduate School of Education Master's degree in learning design with technology. He is a trustee of the Ufl a charity supporting the use of technology in education. Follow him on Twitter [@bobharrisonedu](https://twitter.com/bobharrisonedu) or via www.setuk.co.uk

Further information

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- Gender gap in computing set to worsen as ICT is scrapped, SecEd, June 2018: <http://bit.ly/2PrV9pF>

Can You Replace A Teacher With A Robot?

Chris Yapp



Credit: [Alan Levine](#); CC BY

Here we go again?

Twenty years ago, the question being asked was, “Can you replace a teacher with a computer?” A case of déjà vu? There is a phrase in Hungarian that translated roughly means, “There is nothing new in the world, only those things that we have forgotten”.

The standard answer 20 years ago, was, “Any teacher who can be replaced by a computer should be replaced by a computer”. Is it different this time? For a start, developments in big data, artificial intelligence and machine learning are impacting on other professional disciplines. In medicine, diagnostic systems can outperform skilled clinicians. The practise of law is being impacted by these technologies. We can find examples in architecture, accounting and many other disciplines. There are many studies suggesting that 40-60% of today’s jobs will be eliminated or seriously transformed in the next 20 years by advances across the technology spectrum. Can education claim sufficient uniqueness that teaching alone will not be impacted by robotics and AI?

The problem about the above paragraph and many like it, is that it addresses the wrong question. Try this instead: “How can the education system, its institutions and professionals embrace, appropriately, advances in technology to improve access to and the experience of learning for professionals and students alike?”

Do you believe that the education system that we have is the best that could be? Would an injection of more money, on its own, eliminate all significant challenges? I’d be happy to debate with anybody who believes that both the above questions can be answered yes.

For a start, technology has played a significant part in special needs education in lowering the barriers. We still have serious educational inequalities to address. Teacher stress leading to retention problems, difficulties in finding enough headteachers. I could go on, but you know them better than I do.

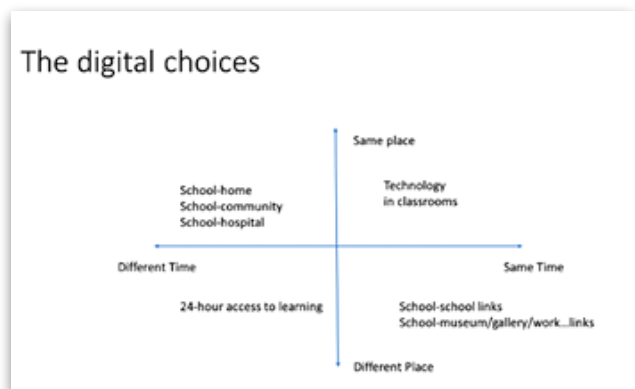
For as long as I have been engaged with educational technologies, there has been a constant background debate about how to make education a researched-based profession. Too much education research is too small to have a real impact on policy and practise, be it at institutional or classroom level.

I would argue that the current round of technology advances provides the platform for the realisation of the teacher as an action researcher at scale. Links between education researchers and practitioners could work at the system level using big data, AI, machine learning and low cost computing help create a culture of education research led by the needs of teachers. In my experience, schools do not suffer from a lack of creativity or innovation. The problem that I have seen is that innovations do not spread across the system. Imagine a health system where each hospital defined its own treatment and drug regimes. Health has its own problems, but there is a culture of spreading practise systemically. I can still use examples from the 1990s about practice in schools that I observed such as virtual reality in a primary school, modern foreign languages between children in classes in different countries and people think I’m talking about the future.

Now let’s look at the school level. Here I would argue is that schools have become masters of adapting to change imposed on them, often framed in the language of earned autonomy, guided localism. You are free to do what we tell you! My own feeling is that people do not resist change, they resist being changed.

I would argue that if schools do not embrace these advances they are not preparing young people for adult life and work in a world where these technologies will be pervasive. However, the obvious push back is that the computer that a 5-year-old uses will be nothing like the ones they will use when they are adults, so how can schools deliver without massive injections of resources?

Consider the diagram below:



Start by thinking about problems and opportunities you have, at classroom level or at institutional level. Back in the 1990s I evaluated a small project where a number of children with serious health problems were given technology that enabled them to stay involved with their school and their friends when in hospital or at home. When one child was in remission they were able to be reintroduced back to

Chris Yapp



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He has been involved in the Future of Education for nearly 30 years and has lectured extensively on this topic including the Royal Society, The Club of Rome, the British Council, World Bank, and the EU. He has spoken on Gifted and Talented education at UK, European and Global Conferences.

He is a Fellow of the Royal Society of Arts. He has an MA in Physics from Magdalen College, Oxford and an honorary Doctorate from Glasgow Caledonian. He is a Patron of NACE, the National Association for Able Children in Education.

school without having experienced significant disruption to their education while away. Think about how you might enhance the education in your school by external links. In the 1990s I was involved in a school project where we had an “artist in non-residence”. An art teacher working in a school classroom had access to a professional artist who contributed to a school art project from his studio miles away. In a deprived community, another school opened at evenings and weekends to train parents and grandparents in how to use computers, true community schooling.

These examples all started from ideas generated from practitioners having real problems that they wanted to see if computers could help. The lesson 20 years ago, and now is the same. The learning horse pulls the technology cart, not the other way around.

In stable times, our values and purposes can be implicit. In changing and turbulent times, we will get nowhere if we are not confident in our purpose and values.

So, what are the purposes of education? What are our values, as society, teachers or parents? These are old questions. We have new tools of incredible potential, but it is potential only.

My advice is this. Don't be afraid of AI, machine learning, robots and big data. On the other hand, do not be complacent about change. The work teachers do will be different. How schools operate will change. The issue is whether we manage change well, or badly.

So, what would be my hopes for the next 10 years?

1. We think about building a model of change management for education at the system and institutional level that involves and engages the professionals throughout the change process
2. We build a system for diffusing innovations that work across all schools. Research in education should, at least in part, be driven by practitioners needs and assessed by their outcomes.

3. We take the ideas of “schools without walls” seriously and look how links to other institutions can enrich the experience for teachers and pupils alike.
4. We build new models for the development of both curriculum and assessment that consider technology advances and how teacher satisfaction and skills are part of the process not a bolt on or afterthought. I am reminded of Seymour Papert: “Don't teach children about computers, use computers to teach them about the world.” Please remember that computers are in that world.
5. We need an education system at every level that is confident about its purpose and values. We are preparing children for a world which we do not understand. Alec Reed, founder of REED Group put it to me well 20 years ago, He described the culture change in comparison to another rite of passage. He envisaged success as a world where students on leaving school put on their L plates to say “I am a learner” rather than take them off because they passed or failed.

At the end of the day, throwing technology at an ill-defined problem doesn't help. If the dialogue goes like this, “The answer is X, what's the problem”, you know we are the next in a long line of “modems in cupboards” initiatives.

I used to say that the biggest policy problem was the flawed belief was:

NEW TEACHER = OLD TEACHER + IT

Add to that

OLD WORLD (Teacher) NEW WORLD (Robot +AI).

The recently founded Chartered College of Teaching is a welcome development for me. Its aspirations fit my beliefs about what education needs to be, at the forefront of building the adults and workforce of the next generations. Maybe this initiative will ensure that the teaching profession is not replaced by robots.

When will schools catch up with the digital proficiency of families?

Mal Lee

While flagging the concept 'Being Digital' (1995) Negroponte[1] never defines the concept as such. In contrast I would identify this concept as an overarching digital mindset, a way of thinking and a set of expectations as well as a set of naturally evolving capabilities. I call this 'the digital'.

In examining the developments over the last twenty plus years I have found the evolving capabilities included both digital proficiency and the facility in the young to take charge of their learning with the digital, and to learn how to learn - in a way that meets their needs. Indeed those born into digitally connected families do so from around the age of three. The digital proficiency of the young is probably best expressed in the reality that nearly 70%, of the world's young are digitally connected (Ericsson, 2016: ITU, 2017) naturally using the current personal technologies in most every facet of their lives and learning.

This proficiency has to do with what the young at various stages of life want to do with the digital in their daily lives now - rather than what the 'experts' believe should be mastered for future application.

While the level of proficiency will vary with age, interest, expertise and support, the bottom line is that for the first time in human history over half the world's young are digitally connected. In not many years I predict virtually all young people will be connected and able to instantly access and work, largely unfettered, with the resources of the networked world.

Similarly for the first time in history the young can directly access the learning of the world - without going through the traditional adult gatekeepers. It is a stark new reality, with immense implications that most governments, bureaucrats and schools have yet to seemingly grasp.

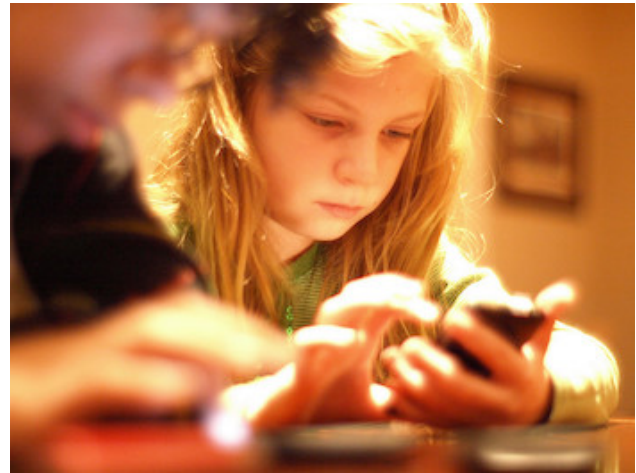
Moreover, twenty plus years will see the digitally connected young continue to grow the capabilities they desire outside the school walls - regardless of what governments or schools believe is important. In their learning, they have demonstrated from around age three their ability to readily work the core functionality of the current personal and family digital technologies (Chaudron, 2015) - the smartphones, tablets remote controls, digital peripherals, games consoles, digital and video cameras, digital TVs, PVRs, home entertainment systems and the increasingly integrated family ecosystem. Well before they can read, write or begin school they have learned to navigate the networked world and use the apt media to access the desired functions. Moreover, they have learnt to use the various digital communications facilities, largely toll free, strongly favouring the latest video communication technologies.

Over the last twenty plus years the young have also learnt to use the new media creatively in the pursuit of their passions, unbounded by the traditional ways. You've undoubtedly

observed the many diverse and creative ways your own children or grandchildren have used the technology.

Contrary to the views expressed by many politicians and older members of society the research affirms (Lenhart et al, 2013; Lee & Broadie, 2018) teens have for many years been tech-savvy. Invariably operating as they are at the cutting edge they understand the dangers well before their elders and the policy makers. That said, the very young, with minds still forming require family guidance, and, in general terms, are not cognitively ready to use 'the Net' unsupervised until around ten (Strom & Strom, 2010).

Learning how to learn



Credit: [tinkerbrad](#). CC BY

In examining the learning with 'the digital' outside the school walls over the last twenty plus years what stands out is the young's ability to take charge of their learning, to do so from the outset, to direct and individualise that learning and to learn how to learn and to do so in a naturally sustained manner lifelong (Lee and Broadie, 2018). With their strong digital mindset and rising expectations the digital technology underpins all their learning. Their first step is to use connectivity. The all pervasive digitally connected world is all they have known. Allied is their ability to teach other folk, particularly those older, to use the new technology, and naturally contribute to the family's learning.

They very quickly - well before formal schooling - become self-learners, with that vital educational ability to shape their learning with the digital underpinning all they do. In being empowered and trusted, and given the freedom to use the technology largely unfettered, they soon learn what they want to learn, how and when, and, vitally, quickly identify when they need to improve that capability and how best to do so. From the mid 90s onwards they have learned the art of improving their learning by themselves, with the aid of the technology or in collaboration with the family, peers and social network (Lee and Broadie, 2018). As the Pew research notes Google, YouTube, Wikipedia and the peers are called upon far more than any teacher (Purcell et al. 2012). And they don't need to be tested! Like all of us they reflect on their performance and when desired improved it.

History demonstrates that in being free to use 'the digital' as desired the young soon learn to use the technology and 'the

Net' to pursue their interests and passions, enhancing their learning in the areas of interest to an often very considerable extent (Ito et al. 2013). It matters not if the pursuit is an interest in contemporary music, astronomy, blogging, fashion design, apiary, drone piloting, professional gaming or coding apps. While children have always had this freedom in their informal learning the parents provision of the technology removed the traditional adult gatekeepers overnight and allowed them to draw upon resources of 'the Net' the moment desired. Moreover they were enabled to decide the best approach to the learning. They, and not an adult, decide when to employ a discovery-based, didactic or highly repetitive learning approach. Similarly, each child chooses the digital tools they need for the task at hand.

From the mid 90s the adolescents and the very young, like all of us, soon learned the unwritten ways of the digital and online worlds, the parameters to work within, the universal mores to be observed and when and how they had crossed the boundaries.

Allied to this, in taking charge of the use of and learning with 'the digital' the young have made extensive and increasing use of the connected world and human networking, long being a natural, almost invisible part of their normalised use of technology. Unwittingly, and initially unseen, the young increasingly build the number of contacts they can readily call upon for all manner of support when desired.

Very quickly the young abandoned the traditional academic boundaries used in the schools, and adopted a more integrated approach to learning, drawing on whatever areas of learning thought suitable (Lee and Broadie, 2018). Largely unseen the young are also learning to make ever greater use of their visual intelligence in all they do. This was particularly apparent in the two and three-year old children's use of the

touchscreen mobile technology (Chaubron 2015), but it was, as you might have noted, apparent at all age levels and in the burgeoning use of visual controls, video and images.

From the mid 2000s the young increasingly have learnt the art of mobile learning, and using the resources in their hands, 24/7/365, just in time and in context. That preference for the mobile technologies is evidenced even when at home, where desktops in designated rooms gather dust. The young from early in life don't see the need to learn only in a physical place, unlike governments and schools that remain site fixated.

These are but a few of the attributes I've identified. As you'd appreciate while focussing on the young the above mentioned attributes are likely found in near all the world's digitally connected to varying degrees.

Roger Broadie and I have tried to develop further this new and complex concept, 'Being Digital' in our book, *Digitally Connected Families: And the Digital Education of the World's Young, 1993-2016* - soon to be released. Keep an eye out for this publication. We are also publishing for parents a follow up Guide for Digitally Connected Families.

Mal Lee



Mal Lee is an internationally published educational consultant and author specialising in the digital evolution and transformation of schooling, and the 24/7/365 learning with the digital by the world's young and their families.

The author of eight publications and literally hundreds of published articles his focus in recent years has been on the digital evolution and transformation of schooling, particularly by the digitally mature schools, and the lead role played globally by the digitally connected families in the young's learning with the digital. In that context, he has written extensively on the variables impacting the successful whole school digital normalisation, and the nature of learning with the digital employed by the young and families outside the school walls since the early 90s.

Mal is a former director of schools, head of board of senior studies, secondary college principal, technology company director and a member of the Mayer Committee that identified the Key Competencies for Australia's schools.

Mal's writings and contact details can be viewed at – www.digitalevolutionofschooling.net His latest publication, co-authored by Roger Broadie, is *Digitally Connected Families*.

The Digital Education of the World's Young, 1993 – 2016, published in 2018

<http://douglasandbrown.com/publications/>

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Memories of Naace 20202 Conference. Credit: T Kuechel CC BY

How can the design of physical and digital learning spaces impact on learning?-

Richard Allen and Allison Allen

“Environments that provide experience, stimulate the senses, encourage the exchange of information, and offer opportunities for rehearsal, feedback, application, and transfer are most likely to support learning.” (Chism, 2006)

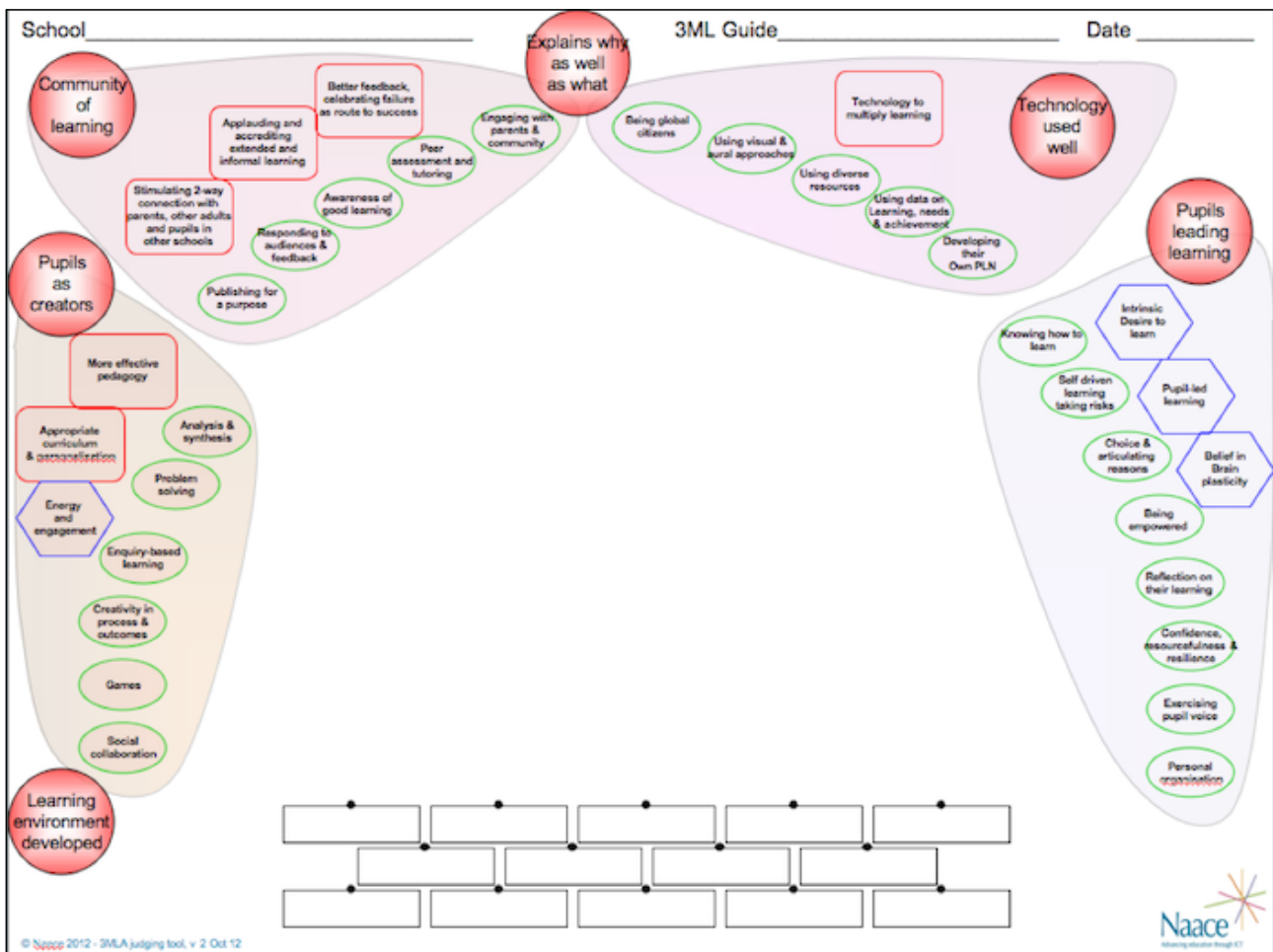
Why consider Learning Spaces?

When asked, most people feel that the design of the spaces in which we live and work makes a difference to how we feel and may affect how well we perform activities. This perception, until now, has not been supported by a strong or actionable evidence base leading to the Education Endowment Foundation (2014) to note in its influential review of factors affecting pupils’ learning, how limited the research was in this area and to conclude that: “changes to the physical environment of schools are unlikely to have a direct effect on learning beyond the extremes”.

and students closer together, but they have little or no input into the design process of learning spaces, the functionality of which should support teachers and learners using emerging technologies and evolving pedagogical strategies.

In our connected and technology-rich world, a learning space can be virtual, online and remote. Schools are beginning to think of 3rd Millennium (Naace 2016) learning spaces supporting the conditions that optimise learning – systems that include personal needs and support positive, collaborative learning. Planning learning spaces is complex - where this process used to involve providing places for quiet, individual concentration, today it means creating more places that accommodate a wide range of activities, technologies, and participants – both physically and virtually. In these spaces, learners need to be able to create, retrieve, combine, display, share and collaborate on information, repeating the process over again as needed, in a space that they can easily remodel and that is well supported by staff that meet and anticipate their needs.

Figure1 - Naace: 3rd Millennium Award Judging Tool Physical Learning Spaces



The most recent research that has come out challenges the perception of EEF researchers, however, suggests that learning spaces have surprisingly powerful effects on learning and yet teachers are rarely given the chance, much less funding, to design them (Tanner 2009; Mazuch 2013; Barrett 2015; Heppell 2016). Technology can bring teachers

“Architectural embodiments of educational philosophies.” (Monahan, 2002)

We are in an era when the school curriculum is changing, high stakes assessment is the focus of teachers, and pedagogy is under scrutiny, with the government funding activities to encourage a return to whole class teaching

(Department for Education and Nick Gibb MP, 2016). There is apparent dissatisfaction among ministers at the attainment of learners in the United Kingdom (Pisa 2015) and yet, aside from teaching and learning, other potential factors are ignored; for example, research undertaken by Royal Institute of British Architects (RIBA) in 2014, found that 80% of schools are operating beyond their life cycle – suggesting that the majority of our schools are unable to provide effective learning environments as they are past their best or at worst, not fit for purpose. The same research found that schools built now are 15% smaller than those built under the Building Schools for the Future programme that was abandoned in 2010 (BBC 2011).

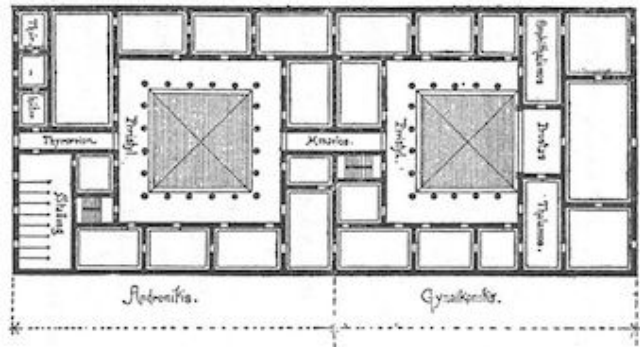


Credit: JISC CC BY ND

Teachers in a large survey (Association of Teachers and Lecturers 2010) were almost unanimous in believing that the school's learning environment had an effect on pupil behaviour and over a quarter felt the environment was not effective. Professor Stephen Heppell's research (2014; 2014), confirms that poor light levels, the wrong temperatures, inappropriate sound volumes and rhythms, humidity, air pollution, CO2 and air pressure can all impair learning; he argues that his results show how these conditions can unfairly skew the outcome of children's work because the environment they are in is damaging to their performance. Yet there remains a gap between research on internal environment quality (IEQ), which focuses on such measurable aspects of heat, light, sound and air quality; and more quantitative aspects such as Ulrich's (1984) evidence of the positive healing effects of views of nature in the hospital environment, and understanding the holistic effects of environments on people.

These ideas are not new; the Roman architect Marcus Vitruvius Pollio in his treatise on architecture, *De Architectura* (Epublication 2006), asserted that there were three principles of good architecture:

- **Firmatis (Durability)** - It should stand up robustly and remain in good condition.
- **Utilitas (Utility)** - It should be useful and function well for the people using it.
- **Venustas (Beauty)** - It should delight people and raise their spirits



Vitruvian house: Wikimewdia CC BY SA

Few of us would challenge the Vitruvian principles; school buildings should be fit for purpose and should work (utility); they should be well-built and sustainable (durability); and they should have an impact on the human sensory experience (delight). The three criteria are entwined within the design process and disregard of all three in balance leads to poor results - frequently (but understandably) school design is often focused on 'function' with consequent loss of learner experience and feeling of wellbeing.

Without the scale of investment such as Building Schools for the Future (BBC 2011), it is still possible for schools to have inspiring learning environments enhancing learning, teaching and wellbeing. Research by Professor Peter Barrett at the University of Salford (2015) found that if an average learner moved from the least effective to the most effective learning environment, their attainment could increase.

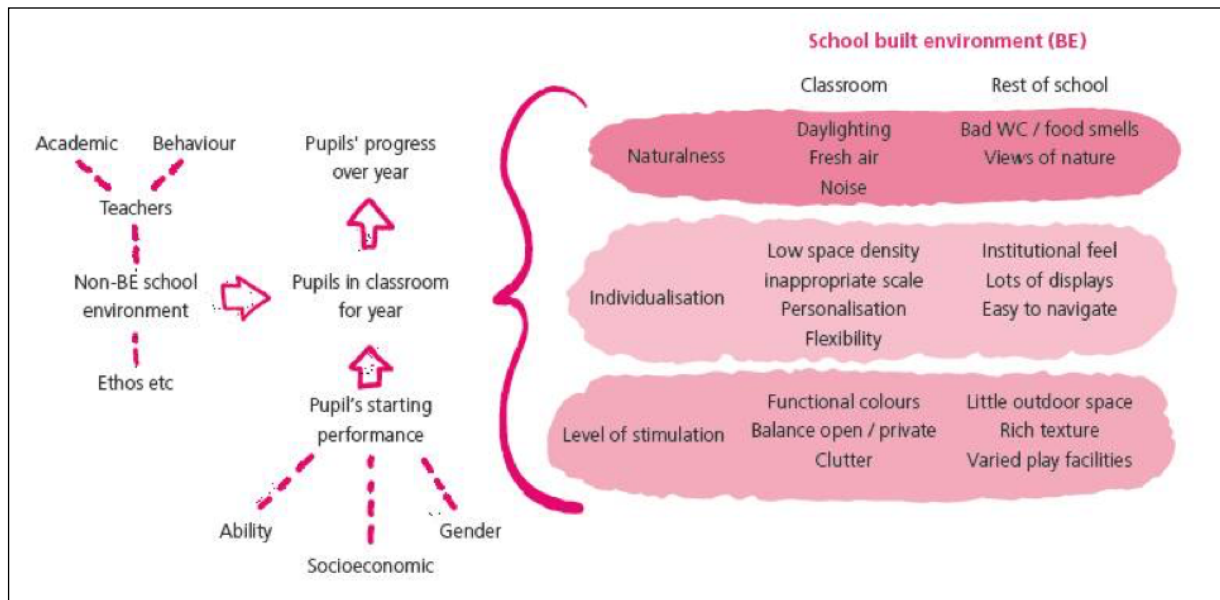
"The single most important finding reported here, is that there is clear evidence that the physical characteristics of primary schools do impact on pupils' learning progress in reading, writing and mathematics. This impact is quite large, scaling at explaining 16% of the variation in the overall progress over a year of the 3766 pupils included in the study. By fixing all factors to their mean scores, except the physical environment factors, the impact of moving an "average" child from the least effective to the most effective classroom has been modelled at around 1.3 sub-levels, a big impact when pupils typically make 2 sub-levels progress a year. As far as we are aware, this is the first time that clear evidence of the effect on users of the overall design of the physical learning space has been isolated in real life situations." (Barrett et al. 2015)

Barrett's research found that whole-school factors such as size, navigation routes, specialist facilities and play facilities do not seem to be as important as the design of the individual classrooms. This point is reinforced by evidence that schools often have a mix of more and less effective classrooms in the same school. The significant point is that each classroom must be well designed. Subsequently, a positive finding is that users (teachers) can affect many of the factors and suggestions show that small changes, costing very little or nothing, can make a real difference - examples include changing the layout of the room, the choices of display, or colour of the walls.

Three types of physical characteristic of the classrooms were assessed: Stimulation, Individualisation and Naturalness - the 'SIN' design principles. The factors Barrett found to be particularly influential are:

- *Naturalness: light, temperature and air quality – accounting for half the learning impact*
- *individualisation: ownership and flexibility – accounting for about a quarter*
- *(Appropriate) Stimulation: complexity and colour – again about a quarter.*

Figure 2 - Organising Conceptual Model (SIN) Adapted from Barrett et al, 2015



The University of Salford research builds on the concept of 'Sense Sensitive Design' (IBI Group 2012), developed by Nightingale Associates in response to 12 years of extensive research that has shown that a range of built environmental characteristics can have powerful healing and therapeutic benefits. Explained by Richard Mazuch (2013), the design ideas are based on the way the body perceives and responds to sensory stimuli.

According to Mazuch, using the basics of light levels, colour, vista, sound, touch, temperature and atmosphere, we can impact on learning through physiological, psychological, emotional and physical means. For example, dimming light leads to quieter movement in school while good levels of natural lighting in classrooms can increase productivity by 18-20%; whereas poor ventilation leading to CO2 build up negatively impacts learning and attentiveness. There are cost-effective ways to address ideas of improving classroom ambience through sense sensitive design: Low natural light can be enhanced through the use of inexpensive natural light bulbs; colour can affect mood, for example through paint, and projection could be used to subtly change the environment throughout the day; olfactory planning is often forgotten, but smell can affect attitude – for example citrus oil enlivens the environment and increases productivity; sound is used extensively in retail but not in

schools - can learners benefit from music, birdsong or gentle wind through trees?

Virtual Learning Spaces

If we are to use technology effectively in our learning spaces, we need to consider what that might be and how it might fit into our physical spaces. In a new build, technology should be part of the fabric and thus considered at the start of planning. Vitruvian principles can also be the basis for good virtual space design and can be used to help analyse why we prefer certain websites to others. In addition, using the principles of 'sense-sensitive design', austerity-driven schools can also cheaply and effectively enhance the learning environment. Layout and visuals are already

important in a virtual space, but perhaps as augmented reality improves, more of the principles can be employed for effective learning in cyberspace.

Our concept of the use of learning technology has changed considerably this century. In 2005 Ruth Kelly, then Secretary of State for Education and Skills for England, outlined a leap in technology to include online spaces:

"In the future it will be more than simply a storage place - a digital space that is personalised, that remembers what the learner is interested in and suggests relevant web sites, or alerts them to courses and learning opportunities that fit their needs."

However, this fluidity will not be realised if online tools and spaces are poorly designed with resources that are only reached via complex passwords and multiple clicks, making it difficult to use the tools or complete an activity – frustration stops us trying again. If we are seeking to empower our learners through technology, we need well-designed technologies and it appears that the Vitruvian principles apply equally well to technology;

- **Firmatis (Durability)** – It won't break, is sustainable and it can scale
- **Utilitas (Utility)** - It should do what the teacher and learner need and function well.

- Venustas (Beauty) – Learners should enjoy the experience and want to revisit it.

Embedded in the principles is the concept of keeping learners safe – the ability to engage in a learning space ‘anytime, anywhere’ implies a planned digital safeguarding programme and concern for potential risk to information.

Flipped Learning



Credit: Ewan McIntosh, CC BY SA

“If you can design the physical space, the social space, and the information space all together to enhance collaborative learning, then that whole milieu turns into a learning technology and people just love working there and they start learning with and from each other.”

John Seely Brown (2000)

Virtual learning spaces allow for the development of learning communities and communities of practice – concepts introduced by Lave and Wenger (1991). Learning spaces with community affordances can reflect a constructivist approach to knowledge (Cross, 1998), whereby knowledge is not simply “discovered” but is socially constructed. Rather than the teacher transmitting information, learners actively construct and assimilate knowledge through a reciprocal process (Bruffee 1995; Schon 1995; Whipple 1987). These approaches are linked with positive behaviours, like increased academic effort and outcomes such as social tolerance and interpersonal development (Johnson & Johnson 1994).

In many schools the practices of “flipped classroom” and “flipped learning” were never introduced by design, but rather evolved when certain resources and technologies were available. The importance is that knowledge materials are available to students on-line and recorded lectures are only one possible source. Exploiting such materials outside the classroom allows for the best possible rich learning experience for each of a widely mixed cohort of students. Students can absorb knowledge at their own pace and repeat or use alternative sources as suits their personal learning. Supporting the materials with online safe and secure chat facilities to promote peer to peer learning activities can deepen the learning experience.

“Flipped learning” now allows the best use of classroom time and involves the teacher as guide and mentor rather than as the didactic imparter of knowledge at the low end of Bloom’s taxonomy. The teacher has class time to focus on the relevant higher level thinking skills applicable to the topic or subject and ensures that each student achieves their best outcomes and the required mastery before progressing (Sams & Bergmann 2013).

Some schools have introduced courses which focus on “Learning to learn” specifically to cover the processes and skills to support “anytime / anywhere / any subject” learning.

One example case study (Allen 2013) showed the following Impacts:

- Saves class time to allow children to apply what they have learned;
- Makes children more confident, independent and highly engaged;
- Teachers are also more positive and engaged;
- Real impact on the quality and quantity of work produced;
- Each child has an “assessment buddy” and both staff and students are collegiate;
- Using MLE forums and e-mail has a massive impact on improved communication;
- Flipped learning often shows a big impact on parental communication and engagement;
- The pedagogy is changing from the didactic model of “Starter, Introduction, Main and Plenary” to lessons and structures based on “What do students need to learn?”, “What skills are missing?”, “Where are the gaps?” and “How are we going to fill them?”;
- There was massive evidence of engagement from log-in statistics (highest in the borough);
- Steady upward trend in progress and results.

Employing such learning structures that rely heavily on access to technology and resources outside of the classroom does mean that such access is regularly audited. Although this is normally not a problem for the vast majority of students or staff, where there is such a problem measures must be set in place to compensate. Most organisations have ways to support equality of access. It is important that such learning practices do not disadvantage any student or teacher.

From a number of ICT Mark assessment reports (Naace 2016) such use of learning spaces and the technology changes the way pupils and teachers interact. The children trust more and are not scared to ask questions, are more confident and less scared of making mistakes. They use their forums and support each other, relying less on needing answers only from their teacher.

Pupils are requesting and practicing independent learning and have, in some year groups, prepared and delivered short lessons to their classmates on their special interest topic. This is an extension of the group research and

delivery to classmates that is a regular part of Discovery Time learning and the Flipped Classroom in-classroom activities.

As articulated by Sams and Bergmann, education is for everyone, but the way we deliver education – and the way learners receive it – is not the same for everyone. Well designed learning spaces give teachers the flexibility to meet the learning needs of all their students, and they give students the flexibility to have their needs met in multiple ways, creating the opportunity for deep and enjoyable personalised learning and the best achievable outcomes.

Allison Allen



Allison Allen is Director of Outstream Consulting and has held a number of education leadership and governance roles in complex multi-stakeholder environments. Currently she is a governor for a multi-academy trust (leading on safeguarding, standards, special educational needs and disability); she is a past Trustee of Naace, London Grid for Learning and is a Senior Fellow of MirandaNet.

She provides consultancy and advice in the UK and internationally to schools, government and suppliers, helping others gain traction with education technologies to establish meaningful vision & remarkable outcomes

Allison is joint author of several high-quality books and publications relevant to education technology, leading on Digital Safeguarding for Naace as well as being co-author of the newly revised national Self Review Framework. She is a national Lead Assessor of the Naace ICT Mark and is a Third Millennium Award judge.

From her early career in teaching, Allison has developed a proven track record at senior level within the education sector, specialising in using education technology to enhance the life chances of children - supporting the moral imperative to develop learners who have the higher thinking skills and confidence that sustains effective, safe, innovative use and creation of technology.

Richard Allen



Richard is a specialist in education transformation and learning services, and an experienced educator to Masters Level. He has a background of business management working with Blue-chip companies in international hi-tech industries, business school senior lecturer, teacher trainer and consultant to government, local authorities, schools and business. He has excellent experience of project and procurement management, costing and finance.

His current research interests include the application of Virtual Reality to Case Studies, the use of technology to enhance learning and support 21st century pedagogical developments. An experienced researcher, especially in technology enhanced learning, he has published case-studies including 1:1 Computers and the Flipped Classroom.

He is a Certified Naace Professional, CEOP Ambassador trainer, ICT Mark Lead Assessor and Moderator, and 3rd Millennium Learning Award guide. Most recently he has been appointed to Associate Membership of the Chartered College of Teachers.

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How does a learning company use research effectively? -

Professor Christina Preston, Vesna Belogaska and Graham Newell, IRIS Connect

Most schools are using digital technologies both in teaching and learning as well as for administration. Now that the local authority advisory services have largely closed down, schools have to negotiate with the edtech industry directly. How are the schools to know whether a company is truly committed to the ideals of education or just looking to 'make a fast buck'?

An obvious way to compare one company with another is to look at their record in research and development. But sometimes research funded by companies is too self-serving: glowing about the perceived value and silent on the issues. A learning company, on the other hand, will always want to understand how their product fits into the school system as well as being committed to improvements.

The MirandaNet Fellowship is a community of teachers, leaders, teacher educators who work closely with associate companies who want to undertake practice-based research in schools. These companies want to learn about their product or service from the school leaders as well as the pupils and the parents where this is appropriate. The advantage for the schools who engage is that they are provided with the product or service under the spotlight and they also receive professional development that is more than just product training. Working with MirandaNet Fellows they become co-researchers looking at the impact on teaching and learning as well as identifying the change issues. But of course the companies who elect to undertake this research and development must be prepared to acknowledge the challenges as well as the benefits of their technology as it is tested in the classroom.

Research active from the start



IRIS Connect, one of the MirandaNet Associates, is a learning company that takes research seriously. IRIS has had who has strong connections with the research community since being a startup at Sussex University. The first idea for a video-based professional development platform was conceived as the result of two academic

research papers[2] which were published in 2007 and 2008 about other similar experimental systems that exposed the value for educators, but also the flaws.

The first early study of a similar system in America found positive and significant effects on classroom teaching and student outcomes. A qualitative analysis of the interactions between the coach and the experimental group of teachers and students revealed that principal components of cognitive apprenticeship were well received and were perceived by the coach and the teachers as powerful additions to the profession development process. The qualitative data was supported by the quantitative student outcome data indicating some significant differential growth in mastery of mathematical content knowledge.

The second system had been used for the remote observation of experienced practitioners by student teachers; and to a lesser extent, for the remote observation of student teachers by mentors and university tutors. Although there were problems with the equipment's reliability some of the reactions about this new kind of learning about practice were encouraging. One teacher educator said that one problem that was being addressed was that student teachers had long ago forgot when they had difficulty grasping a concept. Seeing a class struggling helped to take the student teachers back to when they had that trouble themselves. One of the researchers said, "When they see a video of a class that is pitched too high, student teachers always agree that on first teaching practice, they aim things too high, forgetting where kids are". Another researcher said, "I think videos of lessons by practiced colleagues helps student teachers to understand the level that kids are at with particular concepts".

Working with these early findings, IRIS Connect developers built a video-based professional development platform designed to enhance teaching and learning through collaborative, experiential and evidence-based professional development. The system comprises a secure cloud-based platform with integrated video technology and support services which enables teachers to:

- Access and share theory, linked to model videos of theory in practice
- Record and reflect privately on teaching and learning
- Share securely with peers and coaches in their trusted network over distance
- Engage in professional discussion and evidence-based feedback
- Create Professional Learning Communities
- Access time-shifted or live remote coaching

Overall the key objective of IRIS Connect research projects has been to impact on teaching and learning. This has been facilitated by observing teacher behaviour and their perceptions and enabling conditions for effective, teacher-led professional development. The design of the platform was informed by research, specifically that of Bruce Joyce and Beverly Showers (2002) who identified four main

components that are necessary for effective CPD meaning actual transfer to practice in terms of:

1. Access to theory, or rationale for the new skills or strategies that the teacher is learning;
2. Modelling, or demonstrating what those skills look like in practice;
3. Practicing those skills in their own environment and receiving feedback, and finally
4. Coaching and collegial support.

The findings showed that each of these components is necessary, but in isolation insufficient – only the cumulative effect of these four components results in a high level of actual transfer into practice.

In this context, IRIS Connect's design philosophy has been to use video collaboration technologies to remove the practical and cultural barriers to each of these core components.

Building partnerships

The funds that IRIS Connect invest in research and development are not always obvious to the outsider. Many of the research projects that they have been involved in require the involvement of their staff and their expenses to be paid for by the company. European Commission funding is particularly tough on companies who want to learn in partnership but IRIS Connect have always had a commitment to contribute to a vision of better education for all.

Vesna Belogaska, Head of International Development at IRIS Connect explains how they have built their offering to education with the intention to develop the best product they can and to constantly evolve.

"We are a learning company and we are committed to evolving our solution to provide the best support we can to enhance teaching and learning. Our research interest is driven by trying to find out: what is the impact of using our system and how can we support more effective teaching and learning? We are aware of the complexities in measuring teaching and learning: the impact on the learners is more difficult to measure and it requires longer term studies, so the independent research on impact so far has focused on measurable aspects of teaching that other research evidence point out to having an impact on the learning. For example, in the Education Endowment Foundation research study, we used the outcome mapping method[3] to arrive at our research questions. What does a teacher need to do to develop independent learners and how can that be measured? We consequently decided to focus on developing classroom dialogue in order to better understand the pupils' comprehension and reasoning; developing oracy skills and giving effective feedback."

In fact the company have taken partnership in research very seriously working with a range of partners that include: University of Birmingham, Education Endowment Foundation, University of Bedfordshire and MirandaNet Fellowship in the UK; VIA University College in Denmark; Saxion University of Applied Sciences and University of

Twente in the Netherlands; Harvard University and Mathematica in the USA; the British Council in South Africa and 7 other countries. The British Council People2People project in the Baltics and the Boot Camp project in Thailand incorporated a blended learning approach for teachers of EAL (English as an Additional Language) in primary and secondary schools, aiming to increase the effectiveness, capacity and sustainability of the teacher training. The final reports haven't been published yet, but the initial findings indicate a significant potential for achieving the objective to enhance the teachers' transfer of learning into their teaching practice and impact the outcome of their students by providing a comprehensive service to include web platform access, hardware, local support and expertise.

As for many researchers, an important funder of research and practice has been the European Commission who have shown great interest in this approach to teacher professional learning supported by technology. IRIS Connect have built up an impressive range of partners from their partnership with the European Schoolnet and the two Erasmus Plus projects where they collaborate with over a dozen European universities.

Another successful collaboration has been with John Hattie[4] whose Visible Learning principles resonate with the IRIS Connect approach to professional learning: empowering teachers to take control of their professional learning by using video for evidence-based, reflective and collaborative practice. The findings in Hattie's meta analysis of 26 studies about the considerable size effect of collective teacher efficacy on student achievement has further validated the design and the ethos of the IRIS Connect platform, which fosters supportive, collaborative learning culture among teachers with common goal: improving student outcomes[5].

Research findings



As proof of concept a consistent message is now emerging about the value of the IRIS Connect video-based platform for education. The three main independent research studies on the impact of IRIS Connect carried out so far, focus on key aspects of teacher behaviour and practice: teachers' confidence; collaboration; taking risks; improved teaching and, reassuringly, the findings are very similar.

Developing dialogue and feedback

One important study funded by government agency, The Education Endowment Foundation (EEF), is “Developing classroom dialogue and formative feedback through collective video reflection”. This EEF-funded pilot study looked at the use of IRIS Connect alongside a film club programme[6] that is designed to improve primary school teachers’ use of classroom dialogue and feedback. The project was independently evaluated by researchers at Birmingham University. The EEF trial was designed to find out whether the programme can be practically delivered in classrooms and whether it could be taken to a larger trial to find out what impact it has on attainment.

“The overwhelming majority of teachers believed that the intervention was a good use of time and had improved their teaching. There was also strong evidence that the programme changed teachers’ thinking and classroom practice.”[7]

Sharing good practice in peer mentoring

Run by the British Council and South African Department of Basic Education and co-financed by BEIS Newton Fund, the aim was to pilot supporting mathematics teachers with their CPD in township schools in the outskirts of Johannesburg, using IRIS Connect to enable peer mentoring between UK and SA teachers. The project evaluation[8] demonstrates that the pilot project was successful in advancing aspects of teaching pedagogy, concept development and providing mentoring support to the teachers involved in the pilot project. The findings included: increased teacher confidence in implementing pedagogical approaches and networking, improvements in learner behaviour and engagement in class, improvement in teachers’ awareness of how students learn and developing a more learner-centered approach to their teaching, including:

- Improved lesson planning
- Developed explanation of mathematics’ concepts in class
- Developed differentiation in the classroom
- Increased active learning during the lesson

The report concludes that the potential benefits of using this model of video-based mentoring extend well beyond improving the skills of practicing teachers. One trainee teacher commented that resources like IRIS Connect would encourage him to have a career as a teacher and another said he felt the platform could revolutionise teaching in South Africa because it would help young teachers to connect with each other and share ideas when they were learning the job.

The Deputy Minister of Basic Education, Mr Enver Surty, explained the value of the technology for training staff over huge distances:

“In the South African context, where subject specialists in Maths and Science are in short supply, the IRIS Connect system allows for teacher support offered by district subject specialists. Given the shortage of subject specialists and the vast distances between the schools they support, the IRIS

Connect platform can increase the scope, reach and impact of myriad forms of district support.” (Reintroduction of Mathematics Project (RoMP) project in South Africa).

Developing communities of practice

The MirandaNet Fellowship who have 1,400 members in 80 countries started working with IRIS Connect in 2012. We were surprised at high level of positive response we found amongst in our first quantitative study of 100 teachers who had used IRIS Connect for at least one term:

- 94% said their teaching had improved;
- 85% felt there had been a positive impact on collaboration;
- 88% said their confidence had risen.

We realised with these high percentages that this was a technology that was fulfilling a professional need. The second phase of this research concentrated on a particular aspect of web-based video coaching called ‘in-ear’ coaching. This was prompted by anecdotal feedback collected during the first phase suggesting that in-ear coaching, a feature that can be used with IRIS Connect, was a powerful tool for teachers who had used it. The findings of the follow-up quantitative research project suggest that:

- deep learning, which is replicable and sustainable over time, can be achieved through providing immediate and contextualised feedback that the teacher can instantly put into practice;
- using the platform promotes reflective practice and sharing across and between schools, ensuring that the deep learning provided by in-ear coaching is replicable and sustainable over time;
- pupils are co-operative and the experience can also prompt pupils to be more reflective about their own learning and behaviour;
- the focus on classroom practice in real-time strengthens not just the confidence and capability of early career teachers but of any teacher keen to actively improve their performance;
- sustainability can be of concern if those who set up and run the programme leave the school without training others to make use of the investment;
- this innovation may be resisted if the introduction is not managed with sensitivity. Teachers need to know from the outset that the system cannot be used as means of surveillance and that the whole process is based around teacher control and empowerment.

Indeed, the evidence from this sample indicated that in-ear coaching may have the potential to transform practice where the teacher is comfortable with the process and is keen to learn[9].

Safety principles

The MirandaNet Fellows realised that the teacher’s enthusiasm was related to their trust in the company’s use of the video. Vesna Belogaska explains:

'Empowering teachers, security and privacy is at the heart of what we do – the teachers are in full control of all the data they create on the platform. The adherence to the stringent GDPR regulations was natural to us – we didn't need to implement any significant changes in the way we operate in order to be fully compliant with GDPR. The users of our platform are the data controllers; we don't have access to their data. What we do have access to is anonymous metrics about some of the interaction on the platform, which can be indicative of reflective and collaborative behaviour such as log ins, reflections uploads, reflections sharing and creating collaborative work spaces (groups). There are 4,200 video reflections uploaded on our platform each week, which is a wealth of valuable material for professional practice. Some teachers are happy to share their practice with the wider community, and this is facilitated by our additional privacy feature which anonymises the video file to protect the identity of the pupils and teachers in it, while still being able to hear the audio as usual and still see the movements. We do encourage sharing examples of real practice – not necessarily best practice – which provides a base for very rich and stimulating professional dialogue. As a result of such collaborations with teachers from our community, we have created a series of structured professional learning programmes - the IRIS Film Club. It provides a low risk introduction to the reflective and collaborative practice where we provide the theory behind the teaching instruction we are focusing on, the video-based examples of real teaching practice, and, through guided questions, we encourage collective reflection and professional discussion. This provides a low-risk, effective adoption of this way of professional learning within the education institutions, where they start with learning to observe, notice and discuss without judgement, before they move on to filming and reflecting on their own practice. Since our conception in 2008 we have worked with over 80,000 teachers in more than 24 countries, and our community is constantly growing. What has been fascinating and reassuring is how universal are the benefits of professional learning facilitated by our video-based collaborative platform, regardless of differences in local circumstances. This is the case in very different environments, with different cultures, varied levels of ICT literacy and technology infrastructure.

Having worked with teachers from such different countries as UK and Finland through to South Africa and Thailand, we have learned a lot and have been able to apply and develop our adaptive expertise. We have a large number of anecdotal evidence – critical incidents – which point out to the transformational potential of our platform for teaching and learning and the teachers' desire to connect, collaborate and learn from each other.

Our system allows teachers to be informed, connected contributors, tapping into the expertise in their school, their network, and the wider education system nationally, as well as internationally, enabling them to become agents of change'.

When we receive almost identical feedback from such different environments, it is very satisfying, reassuring and motivating to continue to evolve and connect the teaching communities internationally.

Since its conception, IRIS Connect has evolved significantly. However, their mission in the education sector has remained the same: to drive improvements in educational outcomes through more effective professional development for teachers and schools.'

The CCoT Connect platform

This assurance about the aims and objectives of IRIS Connect is important to members of Chartered College of Teachers (CCoT) because the Connect platform, based on a consistent programme of research and development with teachers has been chosen as the communications platform to extend the benefits of membership.

Indeed as the professional body for teachers and leaders, The Chartered College exists to connect, inform and inspire teachers to take pride in their profession and deliver the best possible education for children and young people. To support this, The Chartered College is now providing teachers with access to evidence of what works and the space to reflect on their learning to achieve excellence in teaching.

Historically, professional development and accreditation have missed concrete links between theory and professional skills in practice. The Chartered College of Teaching is now using IRIS Connect digital video collaboration technology to address this challenge.

The security and privacy of CCoT members and their pupils are key principles for The Chartered College. MirandaNet Fellows can endorse the fact that IRIS Connect ensures that all videos are appropriately permissioned and remain within the control of the teachers and their schools at all times, thereby adhering to the strict requirements of the forthcoming GDPR data protection standards.

The Chartered College's Chartered Teacher programme (CTeach) – which offers an accredited career-long professional development pathway – will now benefit from IRIS Connect's market-leading system to support participants to capture and reflect upon authentic video of the learning in their classrooms. Over 130 participants are currently engaging in three cycles of collaborative enquiry using video as part of their broader accreditation process, in what is one of the first programmes of its type in the world.

Through the IRIS Connect platform, teachers will collaborate and refine their practice with colleagues in other schools. Participants will document this process of refinement and demonstrate their use of educational research to improve outcomes in their classrooms.

Companies the profession can trust

Evidence is accumulating that many of the multinational companies engaged in technology need to be regulated by national and international law. But although the reputations of the giants Google, Facebook and the like have been

compromised we must still, as educators, find ways to work with companies to explore the benefits of education technology because these modes of communication are now embedded into society so teaching digital literacy must be a responsibility of our schools. Working with education technology companies who are engaged in genuine research and development partnerships with teachers must offer us a positive way forward.

Graham Newell: IRIS Connect



Graham is the Director of Education for IRIS Connect which he helped to establish in 2008. He has worked in education for over 30 years as a teacher, lecturer, headteacher and senior officer in a number of Local Authorities. One of his key interests has been to improve the quality of professional development and has taught everyone from mid-day supervisors to Masters Level students at university. IRIS Connect has seen growth and currently works in 20% of English secondary schools and an ever growing number of primary schools. The company has expanded into 13 other countries in Europe, Australasia and North America. It is proud of its active involvement in a number of research activities and national/international projects.

Vesna Belogaska



Vesna is the Head of International Development at IRIS Connect. Since the creation of this research-led company in 2008, Vesna has been involved in various roles, including adoption consultancy, community management and research. She has worked closely with educational institutions internationally to support effective embedding of the collaborative professional learning platform and maximizing the impact on teaching and learning.

Vesna now leads the company's international development strategy. This role includes setting up and managing education and commercial partnerships and collaborative educational projects working across different cultural, political and economic landscape. Prior to her work with IRIS Connect, Vesna had acquired extensive experience in relationship management within the ICT sector.

Professor Christina Preston



Professor Christina Preston, De Montfort University, holds management roles in three edtech professional organisations: MirandaNet Fellowship, Naace and the Association for Teacher Education in Information Technology (ITTE). The reason is her belief in the sharing of profession knowledge and change management issues related to edtech. She has designed and managed many international and UK practice-based research professional development programmes where the practitioners become co-researchers. Since the funding in UK schools has become increasingly limited she has raised research funds from thinking companies who want to contribute to the edtech training of teachers as well as providing an opportunity for deeper reflection on how edtech should be taught in schools. <http://bit.ly/2aMfoLo>

NEWS

UK's first Institute for Ethical AI in Education launches

A new Institute for Ethical AI in Education (IEAIED) launched Thursday, 10/10/2018 at Speakers' House to tackle the threat young people face due to the unduly rapid growth of new technology.

It is being led by educationalist Anthony Seldon, AI in education scientist Professor Rose Luckin and social impact entrepreneur Priya Lakhani and supported by an advisory council made up of senior academics, politicians and entrepreneurs. The Speaker of the House, the Rt Hon John Bercow, commended the new Institute and underlined the need for it.

Sir Anthony Seldon, Vice Chancellor of the University of Buckingham, who has turned around two private schools and who has written a book on the impact of AI on education, *The Fourth Education Revolution*, said: "We are sleepwalking into the biggest danger that young people have faced, eclipsing totally the risk of social media and other forms of digitalisation. The really frightening thing is that the Government is not stepping up to the mark, and the tech companies are eating them alive, making shamefully high profits, preaching platitudes while infantilising our young and exposing them to great dangers. AI could be a considerable boon if we get the ethical dimension right but with each passing month we are losing the battle."

Professor Rose Luckin added: "Ethical, thoughtfully designed and implemented AI could save education: from tackling the global teacher shortage to providing high quality education for everyone. The solution is at our fingertips, if only we are able to ensure that the ethical vacuum of much of today's commercial AI development is filled with the practices, moral values and ethical principles that will ensure society in all its diversity will benefit. Ethics must be 'designed in' to every aspect of AI for use in education, from the moment of its inception to the point of its first use."

Priya Lakhani has seen the potential of AI to disrupt the 'one size fits all' model of education through CENTURY Tech, the learning platform she founded and built with a team of teachers, neuroscientists, and engineers, but believes, "It is important attention is paid - by government, by industry and by the education system - to the ethical issues that arise from introducing AI into education. We must make sure all learners and educators are protected from the risks that unethical use of AI in education could bring about."

The IEAIED, based at the University of Buckingham, will see how data and AI within education can be designed and deployed ethically. The aim is to make the UK a world leader in ethical AI for education by engaging with a wide range of stakeholders to protect the vulnerable and maximise the benefits of AI.

The institute will look at how ethics can be 'designed in' to every aspect of AI in education and training from the inception of an idea for an AI product or service to the adoption of that AI within society.

Assumptions about human behaviour that underlie current AI development and how social values are manifested in AI design will be considered. The IEAIED will look at how ethical frameworks can be grounded in responsible innovation and integrated with our assumptions to transform how AI innovators make decisions when designing for educational AI.

The IEAIED will also examine the purposes of a person's education, to ensure that AI in education does not prioritise certain aspects of learning at the expense of others, which can distort the process of learning and human development.

The Institute has been set up because the growing volume and diversity of data generated raises ethical concerns about what happens to that data, who owns it, who uses it, for what purposes, and who is accountable for its interpretation and exploitation.

AI in Education beyond academic research, where ethical approval must be sought and granted, is the 'wild west', with no consistent or effective governance. Both advertently and inadvertently businesses are taking advantage of people in the way that they are building, implementing and rolling out AI and this needs to be addressed before any more harm is done.

Advisory Board Members include Lord Clement Jones, Sir Tim O'Shea, Geoff Barton, Sherry Coutu, Gi Fernando, David Puttnam, Fiona Boulton, Vivienne Durham, Lucy Heller, Alan Winfield, Essie North and Ann Mroz.

Media enquiries – diana.blamires@buckingham.ac.uk (Sir Anthony Seldon), brody.herberman@century.tech, 07535515937 (Priya Lakhani) or [Dorothy Lepkowska d.lepkowska@ucl.ac.uk](mailto:Dorothy.Lepkowska@d.lepkowska@ucl.ac.uk) 07798 614256

Notes to Editors:

What will the Institute for Ethical AI in Education do?

1. Identify the existing forms of governance, ethical principles, guidelines, standards and regulations relevant to ethical AI in education;
2. Produce a framework for ethical governance for AI in Education for the UK;
3. Produce a roadmap for the development of inclusive, responsible, explainable, interpretable, verifiable and agile ethical governance for AI in Education that will protect people from disadvantage, ill, harm;
4. Build public knowledge and appropriately critical trust in AI in education through public engagement;
5. Demand more from our large technology companies in terms of ethical practice and ethical education and training for educators, trainers, parents and students;
6. Demand support for our Start-up and SME technology community to ensure their ethical practice;
7. Demand ethics training for everyone involved in education or training directly or indirectly;

8. Ensure that ethical AI in education does not bring a greater burden to educators, learners, and parents beyond their needing to understand what is required for them to protect themselves, their students, their employees, or their family;
9. Publish an ethical code of conduct for those working to develop and use AI for educational and training purposes;
10. Provide ethical training and approval protocols for anyone developing or using AI in education and training to encourage ethical transparency and publicly ethical practice.

Priya Lakhani is the Founder CEO of CENTURY Tech, an artificially intelligent learning platform for teachers and students. CENTURY, which launched in October 2015 and has been available globally from September 2016, provides algorithm-based personalised learning journeys to students on a content agnostic platform and offers real-time insights and predictive analytics to educators.

Priya started her career as a barrister, specialising in libel, privacy and reporting restrictions for the press including representing a newspaper in the House of Lords at the age of 25. In 2008, Priya successfully launched a FMCG business and launched products into nationwide supermarket chains and independent retailers. Passionate about CSR and incorporating a ONE=ONE model, the company's charitable arm provided millions of meals and 35,000 vaccinations to the underprivileged. Priya has been a member of the Secretary of State for Business, Innovation and Skills' Entrepreneurs' Forum, an advisory board member to several educational/skills organisations, including a founding entrepreneur of Gazelle Group Colleges. Priya authored children's book, *Zarin's Perfect World*, which was published in 2014 and was awarded Business Entrepreneur of the Year by the Chancellor in 2009 and Officer of the Order of the British Empire in 2014. Priya now also presents on BBC World News as a commentator on world news, politics, business and technology on a bi-monthly basis.

Rose Luckin is Professor of Learner Centred Design at UCL and Director of the EDUCATE EdTech hub. Rose's research involves the design and evaluation of educational technology using theories from the learning sciences and techniques from artificial intelligence. She has a particular interest in how AI techniques can be used to enable more effective, continuous, formative assessment processes and tools. Her 2018 book: *Machine Learning and Human Intelligence: The Future of Education for the 21st Century* describes how we can best benefit from using AI to support teaching and learning, and how the prevalence of AI in our future means that we need to revise what and how we teach and learn now. Rose has advised research councils in various countries, has written widely about educational technologies and is no stranger to providing evidence to Government Select Committees in the UK and EU Commission.

Prior to taking up her post at the Knowledge Lab in 2006, Rose was Pro-Vice Chancellor for Teaching and Learning at the University of Sussex. She has taught in state secondary,

Further Education and Higher Education sectors. Rose is currently a Ufl charity Trustee, a Governor and Trustee at St Paul's school in London and the Self-Managed Learning College in Brighton, the president-elect of the International Society for AI in Education, the educationalist advising the AI and Robotics panel of the Topol review into the future of the NHS healthcare providing workforce, and a member of the European AI Alliance.

Sir Anthony Seldon, Vice-Chancellor of The University of Buckingham since 2015, is one of Britain's leading contemporary historians, educationalists, commentators and political authors. He was a transformative head for 20 years, first of Brighton College and then Wellington College. He is author or editor of over 35 books on contemporary history, including *The Fourth Education Revolution*, which looks at the impact of AI on education. He's written books on the last four Prime Ministers, was the co-founder and first director of the Institute for Contemporary British History, is co-founder of Action for Happiness, honorary historical adviser to 10 Downing Street, UK Special Representative for Saudi Education, a member of the Government's First World War Culture Committee, was chair of the Comment Awards, is a director of the Royal Shakespeare Company, the President of IPEN, (International Positive Education Network), Chair of the National Archives Trust, is patron or on the board of several charities, founder of the Via Sacra Western Front Walk, and was executive producer of the film *Journey's End*. He appeared on the Desert Island Discs in 2016. For the last fifteen years he has given all his money from writing and lecturing to charity.



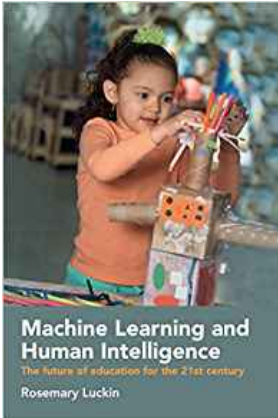
Sir Anthony Seldon; Wikimedia. CC BY SA

BOOK REVIEWS

Machine learning and human intelligence

Rosemary Luckin

Reviewed by Terry Freedman



Luckin's thesis may be summed up as: before we can understand artificial intelligence, we need to understand human intelligence. At the moment, we seem to be in thrall to the wonders of AI, but all AI does is learn and crunch through data very quickly. It is, in short, pretty one-dimensional.

Although the book is chatty to an extent, and draws on personal (childhood

experiences), it is not an easy read. This is an advantage: to get the most out of the book you need to keep stopping and reflecting. Luckin discusses different forms of knowing, and gender differences in this. I mention this because one thing leaps out from this book: nothing is as simple or as straightforward as you might think.

Luckin reminds us more than once that information is not synonymous with knowledge. My only beef with the book is that it doesn't come with a copy of the program the author wrote to simulate politicians' responses to difficult questions!

Read the full review here

This review first appeared in a special AI issue of Digital Education. Read the entire issue

Terry Freedman is a freelance consultant, trainer, speaker and writer. He blogs at www.ictineducation.org

Becoming an Innovative Learning Environment: The Making of a New Zealand Secondary School

Noeline Wright. University of Waikato. Hamilton, New Zealand.

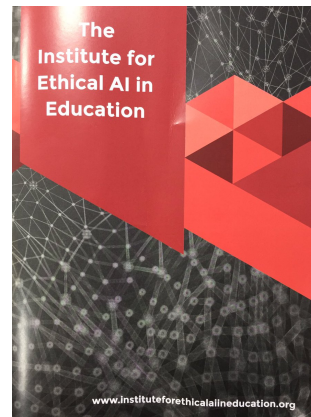
Reviewed by Dr. Daithí Ó Murchú. International Consultant in education, technology and business.

'Becoming an Innovative Learning Environment -The Making of a New Zealand Secondary School', is a wonderful story, written and told to challenge, inspire and encourage other schools to focus on the true etymological and holistic meaning of 'education' and 'leadership'. It firmly places the 'whole-school' community, front-and-centre, in nurturing the unique genius of every student in an envisioned way.

From the outset, Noeline Wright clearly states that the intention of this book is to be highly readable by 'knowledge

workers' interested in the journey undertaken by Hobsonville Point Secondary School (HPSS), New Zealand. Its focus is a very 'personal' voyage, surrounding the school's transformation in becoming an innovative, 21 Century learning environment inside New Zealand's education curriculum and regulatory system.

This is a book about vision with action. It portrays a school 'making itself', changing its 'whole-school' world in an envisioned manner, centring on significant aspects of the school's nascent development. It is about democratic citizenship, leadership, ownership and mutual respect where everyone in HPSS is seen as a 'vital, inclusive and proactive partner' in the 'becoming' of the school community, in a modern learning environment (MLE).



This book is not written for the theorists, it is a truly personal story of one school's honesty, bravery, resilience and envisioned action. It concerns itself with the manner in which a whole-school community nurtures excellence in an inspiring and ever evolving fashion, preparing its students for the society which does not yet exist! As Plato wrote, in the purest

sense, it is about true democratic citizenship and leadership. As Noelene Wright states, "This book is a moment in time...". which encapsulates the process of a school 'Being and Becoming Itself'.

"When you drop any new idea in the pond of the world, you get a ripple effect. You have to be aware that you will be creating a cascade of change". Joel A. Barker

Teaching And Learning In Technology Empowered Classrooms – Issues, Contexts And Practices

Author: Dr Ajitha Nayar K. 2018. Partridge India

Reviewed by Dr. Daithí Ó Murchú. International Consultant in education, technology and business.

Dr Ajitha Nayar K. takes a snap-shot of Digital Literacy in India and explores how it is evolving and changing as a result of national policy frameworks and actual application by all education stakeholders. Moreover, she takes us on a journey which explores the roles and competencies of technology empowered teachers and pre-service teachers and the classrooms in which they implement these policies. The success or failure of international practices and global initiatives in technology-based, curricular experiments and innovations are also discussed and the psychological and pedagogical factors that determine the success and potential of these creativities are also examined.

Chapter one narrates the historical path of ICT based education and the roles of teachers and teaching practices to suit technology presence in the classroom. It concludes that technology empowered teachers and classrooms did not happen overnight, but in 'fits and starts' governed by national policies.

Chapter two highlights global ICT, policy guidelines and features of policy frameworks and their impact on teacher education in India. It concludes that effective policy implementation depends on actual implementation by all education stakeholders.

Chapter 3 refers to technology based, curricular experiments and innovations and the reasons for success or failure of such initiatives globally. In conclusion, it outlines the vital importance of having teacher educators fully competent

in equipping pre-service teachers for classroom practice.

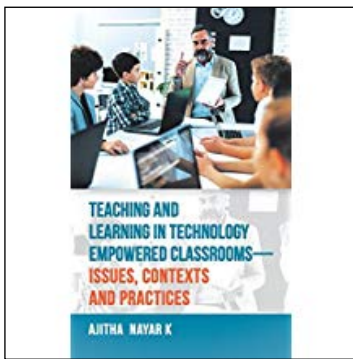
Chapter 4 discusses the opportunities and possibilities surrounding technology interventions for use in the classroom.

Moreover, teacher perspectives with regard to ICT

possibilities and the opportunities are subsequently elucidated. It concludes that steps for restructuring need to begin with policy making, planning and implementation that are effectively adapted and implemented by firstly enabling the technology competency of all stakeholders.

Chapter 5 briefly describes the best ICT practices of technology enabled learning, based on case studies and research review. The psychological and pedagogical factors that determine the success and potential of these practices are also examined.

In conclusion, 'Teaching And Learning In Technology Empowered Classrooms — Issues, Contexts And Practices' ought to have the words 'in India' in the title, as otherwise, in its present form, it presents a very narrow, global perspective of 21st Century, technology-empowered classrooms, in failing to acknowledge the existence of, for example, emerging m-technologies, VR, AR Ai and X-Reality etc., that already play a central and crucial role in many technology-enhanced classrooms elsewhere. That said, Dr Ajitha Nayar K. succeeds in taking the reader inside the reality of everyday ICT classroom practice, emerging practice and policy application in India and clearly outlines the steps necessary for successful implementation.



[1] <https://www.amazon.co.uk/Being-Digital-Nicholas-Negroponete/dp/0340649305>

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[3] <https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/iris-connect>

[4] https://www.amazon.co.uk/Visible-Learning-Teachers-John-Hattie/dp/0415690153/ref=sr_1_1?ie=UTF8&qid=1541027326&sr=8-1&keywords=john+hattie+visible+learning

[5] <https://visible-learning.org/>

[6] <https://www.irisconnect.com/uk/products-and-services/iris-connect-film-club/>

[7] <https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/iris-connect>

[8] <https://www.irisconnect.com/uk/impact/case-studies/supporting-distance-learning/>

[9] <https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/iris-connect>