

# NAACE

THE EDUCATION TECHNOLOGY ASSOCIATION

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*Photo by*

## **COPING WITH COVID**

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Advancing Education. The Naace Journal. Spring 2021

# Advancing Education. Spring, 2021. Coping with Covid

ISBN: 978-1-5136-7485-8

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## A letter from the chair of Naace

Dear Naace members

If your business is education then you have really only been dealing with one thing over the last year. That is true of the teachers, the taught and the thinkers. Whatever the role, all have needed to apply themselves to the circumstances presented by the pandemic. Provision, access, engagement, skills, pedagogy and content are but a few of the themes that have occupied our thoughts, and many of these elements are discussed in the papers that follow. But for those of us, like Chris Yapp, who have been considering education advancement over much of the past 30 years, we have been thinking about these things for much longer.

What is different now, in the context of the pandemic, is that we no longer need to justify the need to attend to these themes. The need is now self-evident and in many cases these strands automatically find their way into school development plans, or as lines on our project Gantt charts.

I am one of those people who thinks in models. I need a top-down view of a problem before I can apply myself to it. So when it became likely that I would become the Chair of Naace I thought a lot about what the title at the top of our Gantt chart or development plan might be. I needed to make sense of the engagement required of Naace over the coming months and develop an appreciation of the “bigger picture” as a sort of a job requirement.

I have commandeered the word “remediation”. It is a common enough term in education. We tend to use in the context of rectifying a problem or addressing deficiency. But there is another, less familiar use of the word that is commonly applied by people working in the field of digital arts. When they refer to “remediation” they use the word to describe the process of translating content from one media into another (re-media-tion), usually as an act of contemporisation. So in this sense, a painting may be remodelled as digital animation, or an analogue film remediated as an interactive digital video.

I am now of the opinion that whichever way we look, whatever strand with which we wrestle, what needs to happen now in education is in fact a remediation of the curriculum. As we might see in the case of a painting remediated as an animation, where the process requires new creative skills of the artist, new technology to support the functionality of the work, new modes of engagement for the viewer, and new contexts in which to present the work; so in education such a transformation is not just a matter of turning a worksheet into a digitally presented slide-deck. The project is much wider than that and requires attention to all the strands listed above for the remediation to be successful. Outside of a project framework reflections and observations of the kind that follow provide invaluable insight that’s usefulness and importance should not be underestimated as we each seek to play our part in responding to an urgent need to contemporise. In some senses they are the only guidance we have as we, to use contemporary terminology, build our “new normal” - or maybe, as I now think of it - “remediate”.

*Your sincerely,  
Laurence Boulter  
Naace chair*



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## EDITORIAL

*Professor Christina Preston*

*Dear Naace member,*

You will not be surprised to hear that many of our articles talk about the impact of the pandemic on education. Since the Tory and Liberal Democratic Coalition won the UK election in 2020 education technology has lost ground in policy development - no longer a third strand of the National Curriculum. The disbanding of Becta, which was the government agency in this area, has also meant there have been no strong champions especially in the area of research.

### **The impact of the pandemic**

But this situation has changed because of the pandemic. The value of technology in teaching and learning has never been so clear. Teachers all over the world are having to learn quickly and adapt in order to children who are no longer attending school.

The first article in this section by Chris Yapp asks why technology and educational reform is so hard. He goes straight to the core of the issue by quoting Professor Diana Laurillard, "Research and development projects on educational media pay quantities of hard cash for development, lip-service to evaluation, and no attention to implementation." He explains that this statement has come back to him recently by official advice on "remote learning." From his long term perspective the current official advice would have looked embarrassing in 1990. The research base of Stephen Heppell, Mike Sharples, NCET (later BECTA), Steve Wheeler, Steve Molyneux, and many others, early in the 1990s was far in advance of what is now being peddled as "guidance". At an early Conference in the 1990s at Woolley Hall, discussions on FE and special education needs and technology were richer and deeper than is currently on offer. Yet Chris goes on to say that we should not descend to a counsel of despair and makes some suggestions about the way forward.

Marilyn Leask and Sarah Younie, are the indefatigable authors of a series of Routledge books about teaching with technology dating from the early 1990s. With their knowledge and contacts they have managed to pull together very quickly a book about how educators have been coping with the issues that have surfaced from the pandemic. In the preface, Rowan Williams outlines the impact of Covid over the years 2020 and 2021. He points out that the Covid-19 pandemic of 2020 brought to light a very wide range of inequalities and disadvantages that seem never to have been noticed, in our own society and worldwide. Not the least of these have been the deeply damaging injustices around access to education. However, it is not only the

### **Professor Christina Preston**

*Dr Christina Preston, a member of Naace for 28 years, joins the Naace Board of Management from an academic background, offering the association a great deal of insight*



*into research about education technology and also effective professional development programmes for teachers. As a retired professor of education innovation she brings an international slant to Naace as she has worked with teachers and researchers in Argentina, Brazil, Chile, China, the Czech Republic, India, Mexico, Pakistan, Saudi Arabia, South Africa and Syria. This led her to create a professional organisation, the MirandaNet Fellowship, which seeks to explore the integration between edtech learning and practice. Christina has plenty of experience in providing advice – both academic and practical – to curious education practitioners. As the Editor of Naace's Advancing Education Journal, Christina plays a pivotal role for the association in organising, collecting and reviewing relevant academic material which will benefit the association's membership.*

increasing marginalisation of learners during the Covid-19 pandemic that is highlighted in the book but the lessons we are already learning from this and how to prepare for the future.

Similar arguments about the impact of the pandemic are highlighted in *Technostress in Secondary Education Settings*, the article written by Caroline Murphy, Ann Marcus-Quinn and Triona Hourigan at the University of Limerick. From the Irish perspective Covid-19 has amplified both the positive and negative aspects of technology at all levels of education. In their findings, until the pandemic in 2020 and the physical closures of the school buildings, the extent to which technology has impacted on temporal aspects of school and home life was relatively under-represented in the literature. The article they present here looks at how technology has contributed to the blurring of the border between work and home for teachers, students and parents.

We welcome also research from Iranian authors, Sara Farshad-Nia and Hossein Nazari, who have good news about narrowing the digital divide in Iran during the outbreak of the Covid-19 pandemic that has profoundly influenced and changed almost every facet of Iranians' lives. The authors explain that in the normal scheme of things, some of the changes might have needed years of planning, organization and preparation to take place particularly in the education sector. The closure of all educational institutions, including schools and universities since late February 2020 has created a dramatic shift towards various modes of e-learning in the education sector, which was to a large extent traditional and classroom-oriented prior to the outbreak of the pandemic. Extraordinary work has been done by the Ministry of Education and those educators who have collaborated with them. The divide between pupils' and parents' competence and the need for urgent programmes for teachers have all been addressed using simple applications like WhatsApp

### **Education Technology history**

The requirement for so much technical competence is new but we have a history of the development of software and devices that underpin our current knowledge. Many Naace members will remember the introduction of concept keyboards, so I have included here Sally McKeown's piece entitled, *From Humberside to the House of Lords – a Journey with Concept Keyboards - a journey down memory lane*.

Sally recalls how concept keyboards – also known as overlay keyboards - were the forerunner of touch screens and in their heyday were seen in garages, swimming baths, pubs and McDonalds. But despite their popularity and usefulness, especially in wet or dirty areas, commentators often spoke of them dismissively as a 'special needs solution'. Sally was particularly struck by this comment in *Curriculum and Resources: computer provision in a CTC* by Lawrence Denholm published by City Technology Colleges Trust Limited, July 1991: 'The concept keyboard is not a means of bypassing keyboard skills, but a way (like a touchscreen, perhaps) of harnessing computer power to help the learning of children who, in many cases, may lack the mental or physical dexterity which would allow them to use a normal keyboard.'

"Just imagine," Sally comments, "suggesting to young people these days, wedded to their phones and tablets, that mental dexterity is lacking. Of course, back then, in the 90s, we could not predict that an alternative language would grow up and that texting would replace syntax and grammar in many communications, even in the business world." How technology has changed our opinion of the relationship between visual and written expression.

John Galloway writes with particular reference to special needs. He points out that in many ways working online has exacerbated the obstacles to learning significant numbers of pupils need to overcome. But on the other hand the lockdown has also highlighted some of the ways in which technology offers

supportive solutions. Galloway indicates how technologies we are familiar with can be used to promote the independent learning that has been so vital in this crisis.

## News

Both Mark Lee and Niki Davis submitted news about the Pew Research Center data. This is an interesting report that 53% of Americans say the internet has been essential during the COVID-19 outbreak. As we have already found in other countries in this Journal, the report indicates that Americans with lower incomes are particularly likely to have concerns related to the digital divide and the digital “homework gap”.

John Sibbald offers a free guide to Blended Learning put together by the Commonwealth of Learning (COL). This organisation has the mandate to promote the development and sharing of open learning and distance education knowledge, resources and technologies. It has brought out several key publications and guides to help its stakeholders use appropriate technologies for enhancing teaching and learning. While research shows that there is “no significant difference” between the learning outcomes of distance and campus students, blended learning environments have resulted in better learner performance. This is usually due to the additional support received by the learners through one or more of the interaction options provided – student–student/student–teacher/student–content – facilitated by the online environment. They have found that students in blended learning environments also spend more time engaging with the digital instructional resources, leading to enhanced achievement.

Lastly we have news of a lecture by Sir Antony Seldon who points to the lack of a clear UK Government strategy for higher education. His thesis was that the HE sector has, increasingly, become the end-product of educational policy rather than the collective voice forming this policy. The balance, he argued, should be shifted towards UK universities becoming more active policymakers regarding their own destiny. Naace members may have views on his stance. Congratulations to the many educators who have used the pandemic as a positive opportunity to do things differently

## Book reviews

Professor James O’Meara, Texas reviews the book, *Exploring Teacher Recruitment and Retention: contextual challenges from international perspectives*. He comments, ‘to say this book is timely is most certainly an understatement. While digital technologies have created new opportunities and new ways of doing things in so many spheres, their role in education has been contested.’ In the book we learn that teacher shortages are widely reported across the globe. Solutions to attract and keep teachers in the profession differ by country, region and in some cases locality. Ensuring a sustainable, high quality teaching workforce is of international concern.

The review of *Sail the 7 C’s with Microsoft Education: Stories from Around the World to Transform and Inspire your Classroom* was undertaken by Gavin Hawkins who is on the NAACE Board of Management. Here Becky Keene and Kathi Kersnowski have struck a chord by finding genuinely engaging and impactful activities designed to showcase the tools available to schools who have access to Microsoft Education tools. The authors stress the importance they place on creating communities of practice for teachers to support each other and share activities which improve outcomes for young people, irrespective of their location.

*Warm regards to you all,  
Professor Christina Preston*

# The Impact of the Pandemic

## Difficult Questions: Why is technology and educational reform so hard?

Chris Yapp



Images Credit : Adam Burt CC BY ND

In 1990, I first made a tentative step into the world of information technology and education. Little did I realise at the time the significance to my life of that “accident”. Before the COVID19 pandemic I had started to wonder what I would say at an Education Conference in 2020, what the lessons I had learned were and how the next 30 years might be different, hopefully (even) better.

Instead, like so many of us, I have had a lot of time to reflect on what has and hasn't happened, and found less opportunity to share and discuss thoughts with others than I had hoped. In the spirit of both “mea culpa” and “things can only get better” I hope that these thoughts can help us all build towards an education system that is both fit for the future society and economy, inclusive and supportive of social mobility.

I am a long standing fan of Prof Diana Laurillard and one of her many pithy quotes gets to the heart of my current reflections.

*“Research and development projects on educational media pay quantities of hard cash for development, lip-service to evaluation, and no attention to implementation.”*

This has been brought home to me recently by official advice on “remote learning”. From my perspective the current official advice would have looked embarrassing in 1990. The research base of Stephen Heppell, Mike Sharples, NCET ( later BECTA), Steve Wheeler and Molyneux, and many others, early in the 1990s was far in advance of what is now being peddled as “guidance”. At an early Conference in the 1990s at Woolley Hall, discussions on FE and special education needs and technology were richer and deeper than is currently on offer (thanks for this tip to Sal Cooke). However, this should not be a counsel of despair.

I am proud to be a patron of a small educational charity NACE. To witness what the staff, members and schools engaged have done during the pandemic - to innovate in adversity, to sustain educational opportunities for the children and support the teachers through traumatic times - has been a personal joy in very difficult times.

There is a Lenin quote to the effect that “some decades nothing happens, some weeks decades happen”. The

last year has shown this not to be a flippant observation. I have spoken with staff who have taken on change in professional practice in the course of weeks because of necessity.

In a glass half empty world, the fact that “we” knew this stuff 25 years ago could make us angry, sad, or gloat with schadenfreude. For me, I think that this is absolutely the wrong thing to do. Actually, I am more energised and optimistic about the chance of success than I have ever been. You may ask why?

The collapse of the exam system in 2020 and the difficulties in establishing a 2021 system and going forward provides the opportunity of a lifetime, as long as we are open, transparent, respectful of diverse voices and reflective of how we got to where we are today. Indeed I would doubt that we could agree exactly where we are today.

I’d like to illustrate that by an observation from the run up to the Millennium. I was one of many people who contributed to a series of workshops at the RSA about the education zone of the Dome. In my workshop nearly every idea put forward about the future of education produced 2 reactions:

1. We’ve been doing that for years.
2. That will never happen.

Regardless of the merits of any particular idea, the shared sense of the “state of the art” in education was problematic then and I would argue still is. I think that there are good reasons for that. Please note that these differences existed whether the topic was technology related or not.

Now that I have grandchildren entering the school system, I have a vested interest in ensuring that they experience a quality education system, motivated teachers, a relevant curriculum and assessment models that reflect their capabilities and potential as citizens and economically active adults, whatever that may be.

So, if I could change the educational landscape to utilise technological progress effectively for all learners, from age 0 to 100, what would I offer as my lessons learned?

1. There is a good reason that it’s been hard.
2. The role and status of teachers
3. Education research and policy
4. The diffusion of educational innovations
5. The governance of educational institutions
6. Learning from outside education
7. The problem of measurement

I have had the pleasure of travelling a large part of the world and have seen some exciting ideas implemented at institutional, subject or classroom level. Yet what I cannot point to is a country, a city, or an educational establishment and say that they’ve got it right. I can admire aspects of Finland, Singapore maths, virtual schools in Mexico or teacher training in Turkey and many others.

Importantly, I cannot accept the argument that schools and teachers (or HE and FE) do not innovate. In my vision of a perfect education system (no doubt different from yours), there will be instances of real practice today somewhere in the world. For me, it is less about the need to innovate or transform than it is about scaling and diffusing practice systemically.

### **Why is it hard?**

I think there are reasons that educational reform has been so problematic globally. Learning is at its heart



a social and a socialising process. It is deeply culturally rooted and should be. There is a quote from Sir Claus Moser that I find compelling: "Education is unique in public expenditure in that it is both the cause and consequence of economic progress". Frankly I dislike the terms "digital" and "learning technologies" and believe them to be a distraction. A look at the original meaning of techne indicates that all technologies are learning technologies. Lumping technologies together as a single entity misses the point. Information technologies can help us do what we do better, to do things differently or to do things that we could not do before. The measures of success are different. Put this together with the Moser quote and it is clear that disentangling cause from effect is far from easy.

### Who is a teacher?



Image Credit: [Alexander Dummer, Unsplash](#)

Parents are our first teachers. I remember an argument made by Sir Christopher Ball that the ideal teacher-pupil ratio was twice the child's age. At 1 that means 2 parents. At 5 it would be 10. It is noticeable that the evidence that I have seen is that the teacher-pupil ratio makes the most difference below ages of around 8. It is clear that private prep schools build in advantage that can last a lifetime. The General Teaching Council and now the National College for Teachers have attempted to define and raise the status of teachers. I think we need to look more expansively. Is the museum education? - is the library, gallery, opera? Are theatre and other groups full of teachers? When a local policeman or fireman, or indeed a community religious leader, is invited to talk to children, are they worthy of, at least, teacher status? Importantly, is an author of children's stories who visits a school a teacher? I have my views; what are yours? The training and development of teachers is also centrally important here.

For me, I have long argued that teachers do not have a work overload, but rather a role overload. Teaching is an art, a craft, a discipline, a performance and a science. One factor in every sector that has been transformed by automation and technological developments is that some roles vanish, some are automated and some are transformed. One of my slides over the years has a simple formula about getting this wrong: OLD TEACHER + IT = NEW TEACHER. I wonder if the pandemic may reignite a debate from the 1990s about the creation of a discipline of chartered assessors.

## **The impact of research**

I know, personally and by reputation, many people who have high profiles in education research who have given far more of their lives than me to improving education. I know people with international reputations whom I admire, but struggle to achieve systemic impact here and abroad. Yet education remains internationally more ideology-driven than evidence-driven. Take for instance what we know about language learning. I'm pretty confident that the best route to becoming fluent in another language is immersion in that language. So why do we have 1x or 2x 45 minute lessons in a week as a school model? I can think of no evidence that supports the dominant practice. One lesson of the pandemic that I am sure will be evident when the history is written is that the stunning achievement of creating vaccines has been driven by global competition AND collaboration between industry, Government, philanthropy, academe and no doubt others. Yet education internationally sees competition and collaboration as either/or. That is an important lesson for me from my experience. An important maxim for me is that absence of evidence is not evidence of absence. Much educational research is too qualitative and small to impact on policy and practice. One area illustrates my concern; learning styles. I was fortunate in the mid-1990s to be introduced to Tom West, an American interested in dyslexia, visual thinking and educational practice. I have frequently been faced by arguments that there is no evidence that learning styles (notably Visual, Auditory Kinesthetic -VAK) make no impact on educational outcomes. My problem with that argument is that I have met too many non-traditional thinkers who have done poorly in school, yet have been successful in life. Synthesising what really makes a difference covers so many different disciplines that a realistic evidence-based approach is illusory even in an era of big data. I would also argue that it is only relatively lately that our understanding of neuroscience has been sufficiently detailed to be relevant to how we learn as a species, let alone individually.

One key link is to ask the question about how teacher professional development is itself reflective of the latest research, be it in subject matter, social sciences, theories of education or organisational theory as just a few disciplines. There are times when I have argued that teachers do not need more training, but more education. That is a thesis in its own right.

## **Innovation in Education**

My experience is that innovative practice occurs every day across the education system at all levels. What is missing is the ability to transfer what works in one location to other settings directly or to be adapted to local circumstances. This, I stress, is not down to individuals, but rather to the lack of organisational infrastructure. The World Health Organisation (WHO) has a global remit on health problems. But here is no World Education Organisation (WEO)!

This problem is compounded by a lack of clarity in educational definitions. Does improvement of teaching practice improve educational outcomes? Over the years I have had different answers from different audiences. I have been involved in discussions over the years about pedagogy where I have ended up not being clear about whether technology impacts on, say, primary vs secondary, or that subject specificities matter. This also leads back to the challenge of who or what is a teacher, particularly from the learner viewpoint. If a local policeman, fire service employee, or a religious leader talks in a school about their discipline, are they worthy of at least associate teacher status? I have been interested in the theory and practice of the diffusion of innovations for more than 30 years. Having seen examples in education and elsewhere, the barrier to what the supposed innovation is lack of clarity.

## **Governance of Education**

A brief tour through the history of technology in education turns up fun gems such as the suggestions that the invention of radio, cinema and TV could replace schools. This is based on a notion that education is the

transmission of knowledge from the learned to a blank canvas that is the learner's mind. If only that were true, life would be a lot simpler! Yet the Open University demonstrates how technological developments can allow new models of learning to scale up. In the 25th anniversary of the OU, it had as many students as the whole of HE in the UK had in the year that it was founded.

Local management of schools, academies, both individual and MATs, in the UK and a wide variety of other models exist globally in both public and private educational establishments. Even in the wealthiest (and in some cases despite wealth) of institutions internationally I would hesitate to point to a replicable model fit for the 21st century.

Looking back at why schools were so ill-prepared for the pandemic, I think that there were 2 key decisions in the last decade. First, the ending of the Home Access initiative left a digital divide in education that has made the move to home-school links a patchwork of potential.

Second, I contributed to a number of workshops during various rounds of Building Schools for the Future (BSF). There were a couple of approaches in the round that was cancelled that impressed and excited me. The innovative practice envisaged brought technologies to the table but in a holistic manner. Layout of physical space, in the classroom and beyond, the environment (heat, light, humidity..) along with flexibility in social spaces were all considered. Importantly, these were driven by professionals based on their experience and input. The buy-in was clear. So much was lost by BSF cancellation.

### Learning from outside education



Images Credit : [Jim Surkamp](#) CC BY NC

Every sector of the economy and society has different models of organisation for both operational delivery and also change. I have often argued that we can 'de-risk' large scale change by learning from others. That is to say valuing difference, not copying, and adapting to a sector's specific needs. I remember discussions about modelling teaching schools in the 1990s based on teaching hospitals.

Over the last decade, as developments in Machine Learning and Artificial Intelligence have encroached professional work, I have seen the growth of communities of practice and peer networks that mimic my experience from the MirandaNet community. One common theme in my experience across different disciplines is that peer-to-peer learning is the most powerful means of effecting change. Top down exhortations over "best practice" don't work, compared to curiosity over "interesting practice".

My wife is a doctor. She sees patients every week and will do so until her retirement. At the same time she is a published author in her discipline. She has also been involved in clinical research and served on ethics panels, policy, regulation and legislative bodies. How many educators have that breadth of opportunity?

Education is far from alone in that many people have to give up the job they love to have influence on the wider system.

I am not arguing that health is better, just different. Evidence-based health is a minefield for another day. I have travelled with her to many health conferences over the years. They are very different from my own discipline in IT, but also education.

I'd like to illustrate this with memories of a world medical congress in her discipline. She presented on clinical research that she was involved in. The conference had academic strands, clinical strands, but also strands on policy, ethics, and the socio-economics of health. Also the audience had academics, clinicians, regulators, industry, trade bodies and policy-makers.

One extreme that I can give is speaking to an audience of several hundred souls in educational research, where no-one put their hand up when I asked if there was a practicing teacher in the room. The silos in medicine are a barrier to health reform and that is recognised. But in education we do not ensure that practising teachers are part of the decision building mix.

### Measurement

We all know that a high skilled workforce is key to high productivity and economic success. Yet how can I take a 5% increase in exam grades and turn it into a measure of GDP growth, even if I want to (I don't). One of the big barriers that I have experienced in technology in education was a desire to turn investment in IT into evidence of improvement, measured in exam grades. That is not just the UK by any means. The movement to rethink assessment, spurred by the pandemic, provides the current generation with an opportunity that I feel my generation did not have. We need a global debate on what it means to be educated in the context of climate change, technological developments, globalisation and the factors that shape this century. We need to reopen the debates on what it means to be a good school and a good teacher. At its heart this is about values, not technology.

If there is one lesson that I have learned many times over it is this. We are talking about LEARNING technologies, not learning TECHNOLOGIES.

### Thanks

Those who know me will recognise that I could go on forever on some of the topics here included. I just want to say thank you to all those who have made the last 30 years so much fun and been a profound part of my life. You know who you are. I hope you do not read this as a tale of woe. This is a hard journey and I have so many personal heroes to thank. The times are changing.

*Carpe Diem.*



**Author: Chris Yapp**

*Chris Yapp is a Futurist with a long term interest in education and technology. He is a Fellow of the BCS and the RSA. He is a patron of NACE and a member of MirandaNet.*

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# Responding to Covid

## The impact of Covid

*Professor Marilyn Leask and Professor Sarah Younie*



*Images Credit : Prachatai CC BY ND*

In the preface of our book, Rowan Williams outlines the impact of Covid over the years 2020 and 2021. He points out that the Covid-19 pandemic of 2020 brought to light a very wide range of inequalities and disadvantages that seem never to have been noticed, in our own society and worldwide. Not the least of these have been the deeply damaging injustices around access to education. In the UK we have seen how school students, whose parents have easy access to internet connections and digital resources, gain immense educational advantage unrelated to their comparative capacities. Parents with limited resources and children at different stages of school life have had to choose which child to support. Working parents and single parents in these circumstances have had to juggle their own personal and professional needs alongside those of their children. It has been estimated that a gap of about a year in educational attainment will have opened up between children who enjoy this kind of access and support and their less well-placed peers.

Project this inequality on to the global scene and its seriousness becomes even more obvious. In many countries it is a challenge to persuade students, especially female students, to stay in full-time education rather than going immediately into the world of work and family – a particularly important choice as far as women’s opportunities are concerned. But for male and female students alike, an early end to school education means a huge loss for their communities as well as for them as individuals: it means a lost generation of potential teachers, doctors, engineers, entrepreneurs and the like.

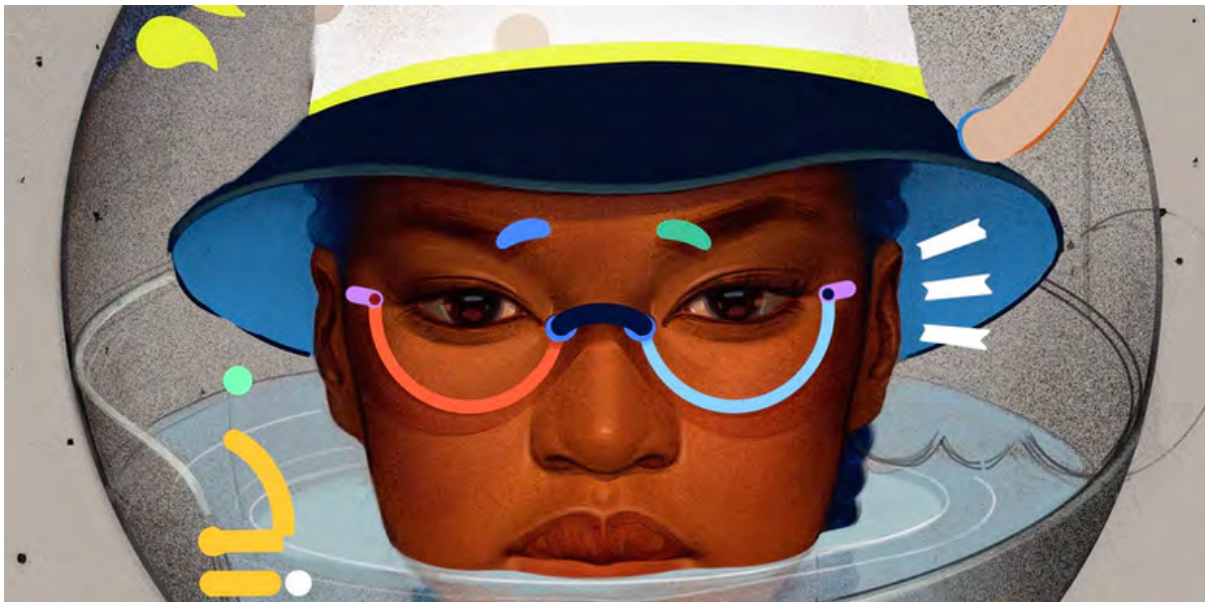
At the moment we have no exact way of measuring these losses, but we know that in one way or another they will shape the lives of young people from low, middle and high income countries. But there is nothing automatic about this. Technologies exist that can carry educational provision to remote or under-resourced environments. Many teachers are actively willing to explore new cultures of teaching. Some of the contributions to this book describe successful ventures in reshaping patterns of pedagogy and supporting

the creativity of teachers; others look at examples of innovative technology in Kenya and Australia and elsewhere.

What seems to be lacking is the political will to turn this situation around. It should be obvious that challenges to educational justice and effectiveness cannot be dealt with by hastily improvised strategies, switching tracks without warning or training in ways that are damaging to teachers and students alike (not to mention families who have to stretch their resources to the limit). And once again we have to remember the challenge for societies where educational freedom and opportunity are hard-won and fragile matters.

This timely book sets out the urgency of the situation and offers practical and achievable ways forward. As with many other areas of our social life, it is essential that what we have learned in the period of the pandemic, about problems that have largely gone unnoticed, should be a driver of prompt and creative action by governments and professional bodies. Too much has been lost already; but we can still transform the hopes of children worldwide if we act now.

### Lessons learned



*Images Credit: [United Nations on Unsplash](#)*

What emerges from those who have contributed to our book is that a number of significant lessons that have been learned since the Covid-19 international lockdown and closure of schools, initially in Wuhan in China in January 2020 and then worldwide from March 2020. Each chapter provides examples of specific lessons learned in relation to the foci of the chapter, for example, which types of pedagogy are best placed to facilitate remote learning, how can digital technologies be best deployed to support learning at home and so on.

Worldwide, where governments opted to support online remote learning they exacerbated existing digital divides: in high and low income countries, significant numbers of learners had no internet access or devices. Several pre-Covid initiatives are worthy of note in bringing internet-connected learning to remote communities. The World Bank identifies mobile Internet buses as a solution for remote communities and these are used in many countries, for example in Texas, USA, communities with no electricity were supported with this solution: 100 school buses converted to provide digital connections to learners (Click2Houston April, 2020). In the Philippines, the innovative portable digital classroom 'School in a Bag'

solution is carried in backpacks over tracks to 'Last Mile' schools to provide remote communities with online connection. In Kenya, stratospheric balloons bring internet connection. In Australia, low orbiting satellites bring connection to remote communities and in Canada, the Telephone School in Manitoba provides yet another solution for reaching out to remote communities. Other countries focused on radio and TV. Further information about these initiatives is provided in the book.

Another major lesson learned during the Covid-19 pandemic period was that when students were no longer in front of teachers, it was harder to assess when children were becoming disengaged; to this end we argue that all learners are potentially 'at risk' of becoming marginalised with remote learning. Therefore 'education emergency plans' must include pedagogies relevant to maintaining student motivation at times of remote teaching. Such careful planning will ensure engagement and progression for all learners as much as is possible in challenging circumstances.

### **Increasing marginalisation of learners during the Covid-19 pandemic**

Originally we had intended to focus in this book on marginalised learners. But as the research data were analysed, we found that all learners were at risk of becoming marginalised when they were no longer in front of teachers. With remote teaching, teachers found it difficult to assess when children were becoming disengaged. So the lessons in this book are not just about continuing education for existing specific groups of marginalised learners, but they are also for the many learners who are 'at risk' of becoming marginalised at times of crises as their contact with their teachers and friends contracts, their hopes and plans for the future are put into question and their family lives disrupted. To this end, we seek a greater understanding of what happened to all learners during the Covid-19 pandemic and outline a range of solutions that address the needs of all learners in the future. We found that particular groups of marginalised learners are at risk of being forgotten and in need of additional support such as SEND and EAL learners and those living in disadvantaged households, in remote rural areas, islands or coastal regions. We are also aware that many of the needs of these particular groups are best served by the local schools that have the in-depth understanding and appreciation of their individual circumstances.

We found that as schools and support systems were 'locked-down', learners without reliable internet and personal devices rapidly joined the already extensive group of marginalised learners across low, medium and high income countries. The disruption and possible loss of learning for the upcoming generation of young people has the potential to impact seriously on every country's talent pool, the chance of rapid recovery from a pandemic and the long-term knowledge base of the society. Young people may end up not possessing the essential knowledge necessary to develop solutions required to address challenges of the future and, even, to maintain the status quo.

### **Looking to the future**

A significant amount of the disruption learners experienced was avoidable because:

- pandemic planning advice existed but was ignored
- open (free) online resources to support schooling, developed by governments in the late 90s and early 2000's in the emergent internet era in education, developed in the spirit of knowledge being shared for the common good, had been closed, put behind firewalls or privatised (Blamires 2015, White et al 2017, World Bank 2017)
- technologies are available to connect remote and marginalised communities to the internet via low orbiting satellites or high altitude balloons as well as to locally generate electricity

## Conclusions

It did not have to be like this and continuity of learning and assessment can be better in future crises through:

- ‘futurecasting’ techniques and exercises to build preparedness
- pandemic plans being integrated into existing operations to support smoother transition to remote learning in times of crises
- harnessing national and international resources through existing international bodies to coordinate access to extensive curriculum resources: schools can only do a certain amount alone. See UNESCO (2020b) for the potential of the Global Coalition for Education to do this. Technostress in secondary education settings .

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## Technostress in secondary education settings

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Photo by [Aarón Blanco Tejedor](#) on [Unsplash](#)

Teaching is considered a highly regulated profession in Ireland. Teachers employed in state-funded secondary schools are required to be registered with the Irish Teaching Council, while the Department of Education and Skills is responsible for the coordination of teachers' employment (Heinz et al, 2017). Employment relations within the sector are regulated by legislation and collective agreements reached between this government department and the main trade unions, the Association of Secondary Teachers of Ireland (ASTI), and the Teachers Union of Ireland (TUI) (Murphy et al, 2019). As a profession, teaching is viewed as one which has many advantages from a work-life balance (WLB) perspective, though research indicates that there is a need to introduce greater WLB policies and programmes for the teaching community (Miryala and Chiluka, 2012). International research argues that the commodification of education is contributing to the intensification of work and to greater performance management around teachers' work in other contexts (Fitzgerald et al, 2019; Frederickson, 2009; Merceille and Murphy, 2017). As such, the nature and context of work has changed and now shares more similarities with the private sector, in particular in relation to demands around working time, and the development of an "always on" culture (MacDowell and Kinman, 2017). The drivers for this can be viewed as symptomatic of broader societal changes brought about through enhanced technology (Mullan and Wacjman, 2019; Moore, 2017).

In many ways the rollout of ICT in schools has followed the adoption of ICT in the wider economy and society. While the benefits of technology are championed it has also been argued that the impact of ICT on work practices can lead to a form of work extension. Over the last decade we have seen the emergence of 'tech-' driven schools which operate primarily on the use of devices - most usually tablets - as the primary

learning resource in classrooms. Currently, in Ireland this expectation is dependent on the policy of each individual school (Marcus-Quinn and Hourigan, 2017). For example, in a typical 'tech-driven' school it is possible to furnish staff with a complementary device as part of the school's contract with an external technology provider. However, the provision of devices to all teachers in Ireland is certainly not mandated by the DES and is dependent on the internal policy of any given school. Hence, for many 'bring your own device' (BYOD) is still a reality. Currently, many teachers are still using personal devices such as phones, laptops, visualisers and wifi speakers, although this is gradually being phased out due to recent GDPR legislation (Dunne et al 2020).

### Technostress

The term technostress was first defined in the mid 1980's by Brod as the "inability to adapt or cope with new computer technologies in a healthy manner". Brod (1984) considered technostress as: firstly, the difficulty in accepting computer technology and secondly, the over identification with technology. In the context of Covid-19, the time for such planning was limited. It is this second part of Brod's definition that we are focussing on in this paper. Information communication technology (ICT) changes require planning and sensitivity with regard to the manner in which change is introduced and implemented (Ragu-Nathan et al., 2008; Atasoff and Venable, 2017). The need for rapid ICT change amid Covid-19 is clearly at odds with this recommendation. The speed at which changes were introduced arguably increased the risk of technostress for all parties involved in the secondary education setting. The idea of technostress has been simply defined by Weil and Rosen (1997) as mental stress from technology. Tarafdar, Ragu-Nathan, and Ragu-Nathan (2007, 2008, 2011) have explored the concept of technostress and have defined technostress as "stress caused by an inability to cope with the demands of organizational computer usage" and classifying technostress creators into five subfactors. These are: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty.

*Table 1: Technostress subfactors*

<b>Technostress Subfactor</b>	<b>Definition</b>
Techno-overload	ICT's potential to force people to work more and work faster
Techno -invasion	ICT's potential to invade non work aspects of a person's life due to the ability to be reached anytime, anywhere, making individuals feel like they are always connected.
Techno-complexity	ICT's potential to create anxiety for individuals when complex communication systems and jargon are used.
Techno-insecurity	A situation where individuals feel their job or role is threatened by technology
Techno-uncertainty	The uncertainty caused by the rapid change and upgrading of technology resulting in an employee's existing knowledge becoming outdated and constant retraining being required.

*Adapted from Tarafdar, Ragu-Nathan, and Ragu-Nathan (2007;2011)*

### Spillover effect: examples of technostress amid the impact of Covid 19 on teachers

Recent work by researchers in Ireland has highlighted the additional stresses experienced by educational stakeholders, when working remotely in order to provide continuity of learning during the pandemic (Mohan et al, 2020; Devitt et al 2020; Hourigan, 2021; Marcus-Quinn, 2021). Teachers primarily reported a huge increase in workload within the online environment. Technostress was reported across a wide range of experiences, with particular reference to upskilling for those with very basic digital skills. This level of techno-uncertainty resulted in the provision of introductory ICT courses for teachers provided by the PDST

(Professional Development Service for Teachers) Technology in Education division. The technical invasion into teachers' homes was another factor to consider, with the pressures of 'camera on' policies reported in some schools exerting pressure on teachers and students from lower socio-economic backgrounds alike. As aforementioned, administrative load emerged as a primary source of stress for teachers. As many schools strove to maintain their school timetables, additional duties such as pastoral care increased as schools tried to establish contact and support with families unable to engage with online classes. Emergency meetings after school time were also an additional factor as teachers scrambled to deal with additional emails and messages across different platforms from students requiring support. In addition, collegial support in the form of ad hoc training sessions was also a feature of how teachers supported each other, often taking place at weekends or long after classes had ended.

### **Spillover effect: technostress and the impact of Covid 19 on students**

Techno-invasion was noted as being particularly problematic in this domain. Before the school closures across the world, some households had a digital policy in place with a clear set of rules for the use of devices in the home (Hayman and Colman, 2016, Chen and Garrison, 2020). Some parents also had family media plans (Korioth, 2016) that included screen time limitations and a curfew for the use of Wi-Fi. Households with plans in place were in a better position to navigate through the first few weeks of the school closures, where many teachers and students reported that they found themselves in an "always on" mode. During the first few months of Covid-19 both social and traditional media outlets reported on teachers, parents and students feeling particularly stretched due to this intense techno-intrusion.

The pandemic also created a huge hidden extra digital administration load for students. Many students found that it was also harder to effectively reference from the book when they were using photos of text and teachers anecdotally reported that student management of materials was difficult, with some students effectively using a camera roll as a copybook. In this new world order, this practice demands a whole new set of organisational and management skills which has not been required or nurtured before now. Parents also face some of this extra administration load. Instead of a hastily written note from a parent to excuse a student from class or to explain an absence, parents now have to write an email or log in to a school app and respond to an absence notification. This type of communication is more formal and notifications from school could potentially get lost in the ocean of online communication traffic. However, there is evidence in the literature to support such communication as having a positive impact on parental involvement and classroom management (Cheng and Chen, 2018).

During the physical school closures, another issue that many reported on social media was the modification of existing school timetables, which contributed to substantial techno-overload. There was a tension around the perceived value of synchronous and asynchronous teaching (Ferdig et al, 2020). During the early stages of the closures, many parents and students felt that they should be receiving synchronous teaching, with many stakeholders assuming that even haphazard synchronous teaching was superior to meticulously planned and recorded asynchronous activity. In fact, the best practice in such a complex and fast-paced environment led to increasing reports of techno-insecurity. This continues to be a divisive topic. The fact that in an effort to try and meet the educational needs of all students, many school principals removed a number of non-exam subjects from student timetables, including physical education (Dunton et al. 2020; Mohan et al 2020). Reducing subjects in the curriculum that were not seen to be central was seen as necessary during this time of crisis in order to allow students adequate space to adjust to their new learning environment. This additional time would have been of immense help to students as they navigated the additional administrative tasks synonymous with learning, preparing and submitting working online.

In September 2020 when the schools reopened in Ireland it was possible to identify aspects of these aforementioned sub-factors as outlined in Table 2. What we can see is an emerging and fluctuating post-lockdown spectrum of technostress experiences. We can identify an independent and separate range of roles and identities that both students and teachers must assume. School cultures of 2020 are completely unrecognisable from the school environment of 2019. Clearly, these levels of techno-overload and techno-complexity are unsustainable. Teachers and students simply do not have the cognitive capacity to work in this manner without support from the Department of Education and Skills. Clearly, issues of technostress and the right to disconnect have emerged as crucial themes when considering the wellbeing of education stakeholders, particularly students, teachers and families. Such factors are presently having a profound effect on reshaping the educational landscape, particularly regarding the demands of remote teaching and learning.

*Table 2 Technostress subfactors*

<b>Technostress Subfactor</b>	<b>Teacher Context</b>	<b>Student Context</b>
Techno-overload	Erosion of work/life balance.Temporal boundaries deactivated. Pressures from students to provide feedback on electronically submitted work.	Modification of timetable.Extended learning time. Varying expectations with regard to work submission.
Techno -invasion	Out of hours contact by the Department of Education Out of hours contact by students No digital curfew. Availability for emergency meeting. Camera off/on policy	Out of hours contact by teachers. No digital curfew. Availability for digital training sessions. Camera off/on policy.
Techno-complexity	Too many apps for teaching; learning and administration . Pressure on novices to adapt quickly to digital teaching. Lack of time and support to trial apps. Lack of experience in trialling apps for feedback.	No clear communication policy. Multiple email accounts (school; personal; parental; external provider.) Lack of time to learn how to integrate apps. Inconsistency with device and task.
Techno-insecurity	Professionalism undermined due to inexperience with remote teaching. Ability to deliver feedback threatened by lack of digital expertise.	Pressure to submit high quality work may have resulted in plagiarism issues due to unmonitored use of the digital solutions. Pressure on non-exam years to perform well in order to have good results on file.
Techno-uncertainty	No time to develop teaching methodologies appropriate to remote learning. Reduced access to models of best practice due to social and professional isolation.	No time to develop learning strategies to adapt to remote learning. Limited opportunity to work in groups for peer learning opportunities.

*Adapted from Tarafdar, Ragu-Nathan, and Ragu-Nathan (2011)*

## Conclusion

Between March and August 2020 there was a proliferation of surveys and national media coverage in relation to how Covid-19 has impacted the work-life balance for teachers and students. One of the most comprehensive was carried out by Ireland's Economic and Social Research Institute (Mohan et al, 2020). They surveyed school leaders on their experience of addressing the challenges arising from the sudden switch to remote learning. This research highlighted that the ability of schools to act "was impacted by schools' prior adoption of technology, and the level of access to digital technologies and broadband availability in their catchment areas". In Ireland, the Education Act (1998) is a key policy document in Irish education, emphasising the rights, roles and responsibilities of key stakeholders, including parents, teachers and pupils in schools (Harrison et al, 2016). There is an impetus on all stakeholders to begin to shape regulation in regards to technology use which will ensure better outcomes for teachers, students and parents. These arrangements risk becoming normalised as part of the career path of young teachers. Wilmore and Beetz (2001) point to the important role of school principals in the successful adoption of technology in schools. In the wake of Covid-19 this role is critical in enforcing and/or establishing policy which supports the healthy adoption of technology outside of school hours by both teachers and students. In addition, workers will continue to have ongoing changes to job functions that require continual skill acquisition and decisions related to career development, by extension. Atanasoff and Venable (2017) argue the phenomenon of technostress can be expected to continue. In education, this means that policies need to be developed which support the teachers in mainstream in acquiring these skills. As such, a coordinated policy from the Department of Education and Skills and the Teaching Council is required, such that responsibility for development is not placed solely at school or teacher level.

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## Narrowing the Digital Divide in Iran during Pandemic

Sara Farshad-Nia, Hossein Nazari



Photo: Sam Cafe, Terhan by Behzad Ghaffarian on Unsplash

The outbreak of the Covid-19 pandemic has profoundly influenced and changed almost every facet of Iranians' lives. In the normal scheme of things, some of these changes might have needed years of planning, organisation, and preparation to take place. One of the areas that has been dramatically affected in the aftermath of the pandemic is the education sector. The closure of all educational institutions, including schools and universities since late February 2020, has created a dramatic shift towards various modes of e-learning in the education sector, which was to a large extent traditional and classroom-oriented prior to the outbreak of the pandemic.

While the Fundamental Reform Document of Education (2011) has emphasized the necessity of integrating ICT into pedagogical and learning practices as a strategy for the promotion of learning, in practice the move towards the implementation of this strategy has been relatively slow. This slow pace, according to Pishnamazzade (2020), an expert in the field of education, can partly be accounted for by the fact that for years there was a general scepticism towards online environments and it was deemed somewhat detrimental to students. Nevertheless, in the extraordinary circumstances brought about by the pandemic, the Ministry of Education turned to E-learning and to exploiting the potential of virtual learning environments, to partly address the monumental challenges to the country's education sector posed by the closure of schools. This is likely to have required extraordinary work by staff in the Ministry of Education and those who have collaborated with them, some of which is described below.

Lacking the necessary infrastructure to tackle such an abrupt and substantial shift, the WhatsApp messenger, which was already the most commonly utilized messaging application in the country, became the predominant medium for teacher-student communications, through which lessons, video clips, voice messages, and assignments could be exchanged. Concerned about the students' administration, privacy, and security issues, the Ministry of Education soon launched a national messaging application specifically designed for teachers and students. The program is named SHAD, the Farsi abbreviation for what can be translated into "student educational network".

The application has been successful in providing a platform especially designed for student-teacher



communications and recording students' attendance rolls. However, given the challenges of software production within a short timescale, it was not surprising that the initial version of the application had its own drawbacks, which, on occasions, made it inconvenient to use. Lack of compatibility with the IOS operating system used by Apple products as well as devices running older versions of the Android operating system, heavy application size, low upload and download speed, and limited were some of the drawbacks of the application.

Some teachers and education experts have articulated concerns about the lack of educational equity and what they perceive to be a digital divide amongst students. According to statistics from the Parliament Research Center, around 30% of the 14.5-million student population lack access to a digital device, including the SHAD application. The different rates of ICT Development Index (IDI) between different provinces and/or low family income can be cited as factors that have contributed to such a gap among students. According to official reports from the Parliament Research Center, the sanctions imposed on Iran, the inflation rate of 34%, and economic recession exacerbated by the COVID-19 pandemic have raised the poverty line up to 80% in two years. Under such circumstances, which have adversely affected significant portions of the country's large population, affording what is reportedly one of the cheapest Internet prices in the world, let alone a digital device, has proven far from convenient for many families.

To narrow the digital divide between students, just recently the Ministry of Information and Communications Technology offered generous free internet packages to both students and teachers. Also, initiatives are introduced to provide the students in need with affordable tablets. For instance, according to the Managing Director of the Imam Khomeini Relief Foundation, people have made a substantial donation to supply the students in need with free tablets. As such, an estimated amount of 50000 tablets will be distributed amongst such students across the country. The Islamic Parliament Research Center (IPRC) has also announced the allocation of a budget to provide tablets for nomad students and students from lower-income families. This is to be offered either in the form of a gift or an interest-free loan, financed from the country's 2020 income.



*Image Credit: Milad Communication Tower: [Reza Jahangir, Unsplash](#)*

Broadcasting educational programmes featuring teachers teaching to the Standards on Education Channel in the national TV is another form of E-learning initiative launched by the Ministry of Education to reduce the digital gap between students, which goes a long way toward promoting educational equity in the country. To do so, outstanding teachers from across the country are invited to teach textbook contents of

different courses in the form of short, 25-minute lessons. These programmes are not only especially useful for students with little or no access to digital devices or with teachers whom they cannot use their expertise in online teaching, but are also beneficial for fellow-teachers who get to become familiar with different pedagogical practices and can, in turn, implement them into their own classes. These programmes are also available on the TV channel official website at <http://tv7.ir/tvschool>.

According to Iran's Minister of Education, arrangements have also been made for the small student population who live in areas that may not have access to a digital TV. With the help of local teachers, either the schools are kept open or the students are provided with learning packages specifically designed for self-study. The private sector has also significantly contributed to alleviate the situation. For instance, they have been active in the provision of a series of video recordings teaching different lessons of the school textbooks at different levels, free of cost to students and their families. They used the Telegram messaging application, the most efficient and one of the most popular messenger apps in the country, for this purpose.

In addition to the digital divide among students, the digital gap between the student generation and their parents and teachers is another concern, according to The Ministry of Education. While many students are excited about the online environment and the use of digital devices, their parents are concerned both about their own digital skill and the potential risks the online environment entails for the students, not being entirely confident about its learning outcome. According to some school principals, initiatives have been taken to inform the parents of online environments, their possible threats and challenges, and how they can support the teachers and their children in this regard.

Furthermore, a significant number of teachers are also facing computer anxiety due to their limited ICT skills and the challenges posed by virtual environments. To address the issue, the Ministry of Education offered a series of online professional development programmes on such different topics as stress management in online teaching, digital literacy, online pedagogy, and ICT in education. Some examples of these programmes can be found on the website [eyadgiri.ir](http://eyadgiri.ir). In addition, the Ministry of Education invited a group of experts in the field to broadcast a TV series on the foundations of online teaching and learning. These TV series are also made available online on different platforms for teachers to view at their own time.

Another significant development apropos online teaching is the fact that, faced with many common problems and challenges, the teachers themselves have started to interact with each other, discussing their e-learning issues through various teacher-administered groups on Telegram and WhatsApp. To share ideas with their colleagues, more techno-savvy teachers have uploaded some of their own produced work on different platforms such as their Telegram channels, Aparat (an Iranian online video-sharing platform) channel, Instagram pages, or their own webpages. To further facilitate online teaching and learning, and recognizing the growing need for online education, the private sector has also contributed to teachers' professional learning by offering online workshops, producing free educational video clips on online teaching, and providing course material for them. For instance, a group of educational technology graduates uploaded educational videos and tips on online teaching on a Telegram channel named Emergency Teaching.

One may critique the behavioristic and traditional approaches taken in some of the learning opportunities provided for both students and teachers and the lack of collaboration and communication between them. This, however, may be explained by considering the fact that the constructive approach to learning is, as yet, at a preliminary stage in Iran's educational system, and many teachers may not have the required experience or expertise to transfer this knowledge to an online environment, which they deem to be a new and challenging environment.

In addition to the issues surrounding the foregoing digital divide among students, the Ministry of Education research center has voiced concerns over the wellbeing of students at home. This is because financial issues, the cost of providing digital devices for students, and the extra attention the students need for their schooling has created greater stress and tension for parents already dealing with a highly stressful situation brought about by the pandemic. This situation is echoed in a statement by the General Director of Counselling and Psychological Affairs of the State Welfare Organization of Iran, according to which family disputes have tripled during the pandemic when people were home-quarantined. Considering the fact that this is a complex topic, action to address the problem is likely to be challenging for any agency, including the Ministry of the Education.

In sum, although it has generally been a catastrophe of unprecedented magnitude, the pandemic has precipitated a substantial, and propitious, shift in the education sector. Amidst the myriad challenges created by the pandemic, the government, teachers, the private sector, and charity organisations are working collaboratively to increase the educational equity and to narrow the digital divide amongst students. Therefore, it seems that despite all the existing challenges, the pandemic has significantly contributed to maximizing the educational potential of the country. More specifically, it has empowered many individuals and organisations involved in the education sector to undertake and implement important initiatives to facilitate and enhance learning and teaching—a fact that attests to the dynamism of the education landscape and the malleability of educational and pedagogical practices.

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# History of Education Technology

## From Humberside to the House of Lords - a Journey with Concept Keyboards

Sal McKeowan



Mencap Awards

Concept keyboards – also known as overlay keyboards - were the forerunner of touch screens and in their heyday were seen in garages, swimming baths, pubs and McDonalds. But despite their popularity and usefulness, especially in wet or dirty areas, commentators often spoke of them dismissively as a ‘special needs solution’.

I was particularly struck by this comment in Curriculum and Resources: computer provision in a CTC by Lawrence Denholm published by City Technology Colleges Trust Limited, July 1991: ‘The concept keyboard is not a means of bypassing keyboard skills, but a way (like a touchscreen, perhaps) of harnessing computer power to help the learning of children who, in many cases, may lack the mental or physical dexterity which would allow them to use a normal keyboard.’

Just imagine suggesting to young people these days, wedded to their phones and tablets, that mental dexterity is lacking! Of course, back then, in the 90s, we could not predict that an alternative language would grow up and that texting would replace syntax and grammar in many communications, even in the business world.

A website [ict4u.net](https://www.ict4u.net/components/concept.php) (<https://www.ict4u.net/components/concept.php>) has a decent enough definition: ‘A concept keyboard is a specialised keyboard with no pre-set keys. It relies on a touch sensitive screen with the key or overlay displayed on the screen. Each key can be programmed with a wide range of different functions. The overlay is often used as a quick and easy way to input items without needing to type anything or use a mouse.’

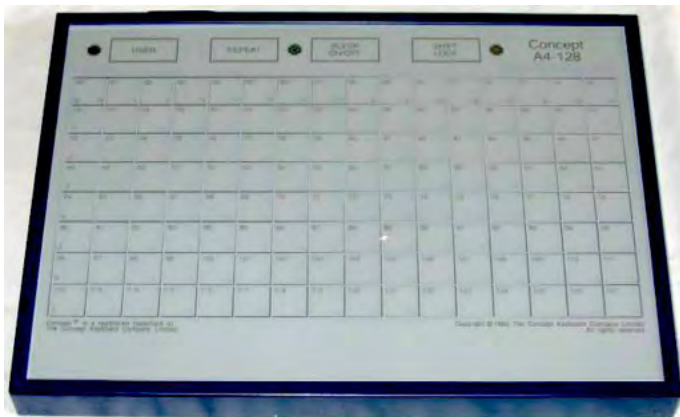
### What about their value for learners with SEND?

Each area of the board could be programmed to give a variety of inputs which could include letters, whole words, phrases or graphics. For example, a user with learning difficulties could have an overlay of pictures

each of which could input some text to help them write a story. Concept keyboards made the computer both more accessible and more versatile.

- They could be programmed to offer a larger key area than the standard keyboard to help users with motor disabilities
- They could be used to provide a simple keyboard layout
- They could have tactile or high contrast overlays to help users with visual impairments
- They could send commands to the computer to control the mouse
- They could act as either one or two switches
- They provided a quick way to access a picture bank, sounds, synthetic speech or video clips or to operate a CD Rom for learners who would struggle to find their way round an operating system via menus or commands

### Exploiting the potential of concept keyboards



A government agency in Coventry, the Microelectronics Education Support Unit (MESU), had the bright idea of employing teachers and subject advisers to lead the development of computing and its applications in the classroom. This way, products would be tailored to classroom topics so teachers would see the relevance of technology and not just use it for office work.

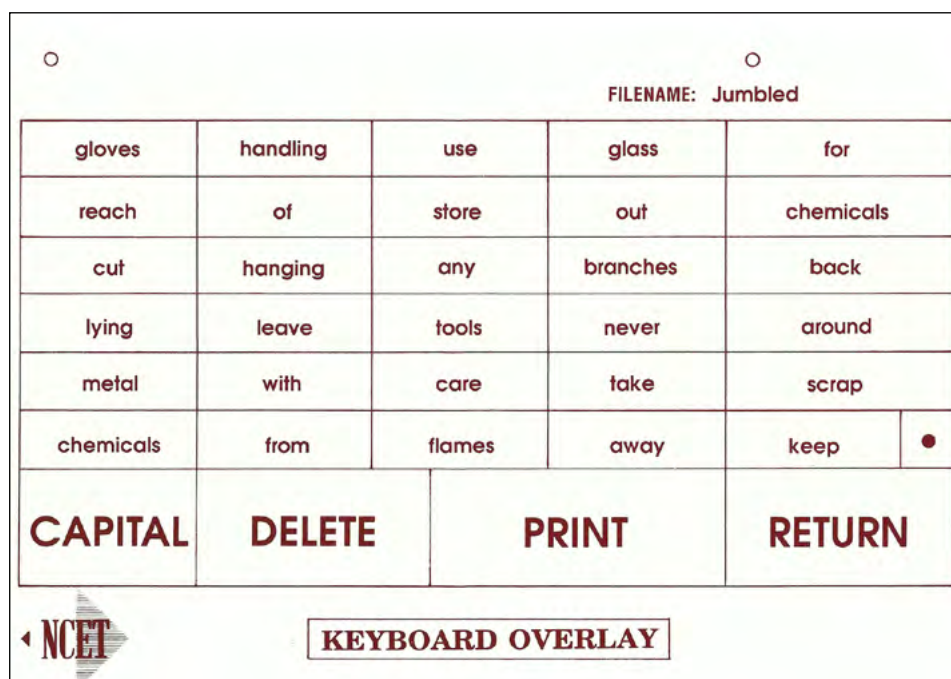
MESU education officers made ready-to-use materials that schools would teach year in and year out, such as the rain cycle, parts of a flower, parts of the body, cloud formations, planets in the Solar System, and animal classification. History topics included exploring parts of a castle, Tudor Kings and Queens, Roman clothing, a centurion's armour and exploring the Mary Rose using a cut-away diagram of the boat.

### Writing

People were quick to seize on the concept keyboard's potential as an alternative to the standard keyboard for writing. They created topic-themed word banks on an overlay so would-be writers were not confined to the words they could spell. This led to Clicker from Crick Software, originally aimed at pupils with physical disabilities, which has become one of the most successful literacy products of all time and is used in mainstream education in the UK and overseas.

These early overlays proved beneficial for learners with dyslexia. The students were not relying on memory or inadequate spelling skills to write unfamiliar or difficult words. Instead, they were looking again and again at the correctly spelt words on an overlay, subconsciously learning the correct shape and structure of the

word. They were also focusing on what they wanted to write and thinking in units of meaning instead of just focusing on an individual word or letter. As a result, they become more fluent and confident writers.



### Picture sentences

These overlays offered early attempts at differentiation, with vocabulary of increasing sophistication, or phrases demanding different levels of reading skills, appearing on the six levels of Touch Explorer. Not only could one overlay help students at different levels of literacy, it could also take an individual student on a journey, from single words and little phrases to sentences and paragraphs of increasing complexity.

### Numbers and data collection

Overlays were also used for mathematics and number work. Many people had tried them out for shape-matching activities, sequencing and number recognition, identifying shapes - the bedrock of Early Years work. But then we discovered the same technology could be used for secondary maths as well, when the Advisory Unit: Computers in Education in Hatfield, showed concept keyboards could be an input device for entering numbers and formulae into spreadsheets. They created samples based on the theme of video hire and selling food in a kebab shop.

Concept keyboard overlays were ideal for speedy data collection: gathering information on how pupils travelled to school or the different pets owned. The same approach was also used in colleges to check out food values or survey the range and types of accidents in the workplace.

Schools also used them for displaying and comparing data. I seem to remember an overlay for a high street, possibly in Lancashire. There were six levels, each equating to a particular census year that recorded who lived in the properties, the different shops and businesses that served that community and let pupils explore how the high street had changed over time.

The idea was that this product would be a template and that teachers would create their own. It would reflect the changes in their own high street and would tap into local history for My Town projects etc. What happened in reality was that most schools got to be very familiar with one northern town over six decades.

## **Living up languages**

Some of the best examples came from MFL teachers. At this time foreign languages were the province of secondary schools and everyone accepted the idea that MFL was a minority subject. We talked about French and German; Spanish was just coming on board and no one was reflecting on the number of community languages spoken in schools.

Many students dropped languages at the first opportunity and there was a strong feeling that children with special needs should not be taught a foreign language as it would interfere with their spelling in English. Instead, young people with dyslexia were often condemned to a diet of yet more phonics and spelling lists.

But MFL teachers could see the benefits of the concept keyboard. Here was an opportunity to match pictures to text or Widgit symbols to unknown words. It was easy to make overlays with photographs of family members and pets, so children were motivated to use the language, instead of learning the standard vocabulary from textbooks and struggling to find something to say about their father who didn't live with the family any more. This was a fine early example of the benefits of personalised learning. Children enjoyed learning to count to 10 or 100, reciting days of the week, naming items of clothing or talking about the weather. In fact, in some special schools this was part of the routine every morning and so dual language overlays were born.

Some teachers were more ambitious and set up scenarios. A popular one was a role play in a warehouse. Students were divided into small groups and had a cassette recorder and cassette – the latest music technology of that time –, a computer + Prompt/Writer. They listened to what we would now call Voicemail messages from the cassette: 'Bonjour, je voudrais trois jupes rouges'; 'Salut, moi j'ai besoin de six pantalons verts'. They would press the picture of the item of clothing on the overlay, then the colour and number and print a list of orders at the end of the session.

My favourite resource for French was called Eautun and was created by advisory staff in Worcester led by Jayne Jakeman. Like many overlays it started life at a residential course where advisory teachers came together and were given time and space to create something. Eautun was created for children who traditionally made little progress in French and thought it was 'too hard' or 'boring'. So, alongside learning simple structures and key vocabulary, they had practical activities and would cook a meal, following a recipe in French and knit a scarf from a French pattern.

It was fun. It morphed into a soap opera as we met characters, learnt about their jobs, family members, likes and dislikes. To this day I can remember the creepy twins who ran the pet shop 'Les jumeaux aiment les serpents'. I seem to think that there were also little hints, which teachers picked up on, of which residents might be more than 'les amis'. The outcome was that 'low achiever' groups had a good time and learnt more authentic French, while higher ability classes still complained that their French lessons were boring.

## **Developing age-appropriate materials for adults**

Further education was slow to come on board. It came as some surprise to find staff in colleges and schools dismissing overlay keyboards as too young or inappropriate for their students. After all, those same students used them to get money from a cash dispenser or a can from a drinks machine. In fact, overlay keyboards started in the workplace, and some key areas of industrial training used exactly the same technology.

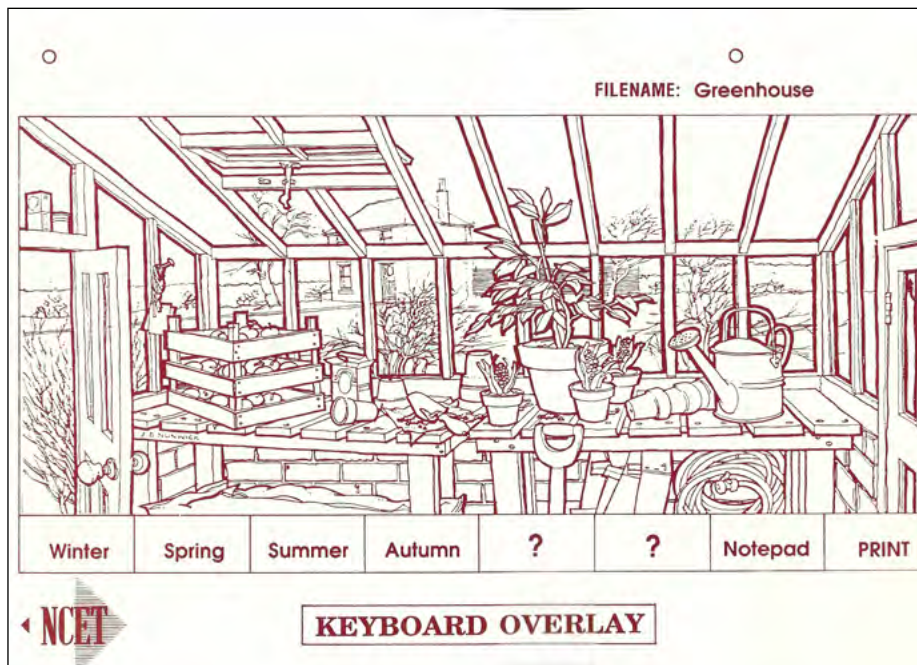
Nevertheless, some staff were evangelists, especially a group of lecturers on Humberside who made overlays to introduce and teach French culinary terms to catering students, and college staff in the north west who built up records of achievement using overlays and ClarisWorks templates.

I worked with Pam Dunwell, an FE adviser for learning disabilities, Bishop Burton Agricultural College and

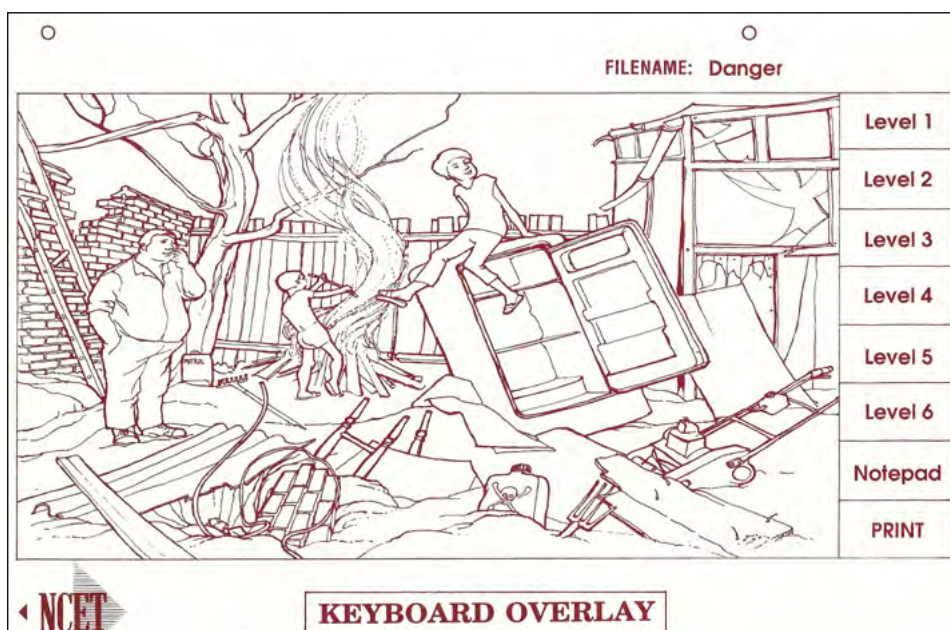


adult and community staff to create In the Garden, a pack which would appeal to horticulture students and people who enjoyed gardening as a pastime.

The starting point was a group of students in a residential home coming into education for the first time. Kath the tutor set up a greenhouse project which she intended to be a practical activity, but which could also act as a focus for literacy, numeracy and communications.



Pauline, 48 years old, was a beginner reader with cerebral palsy. She had limited motor skills and found speaking a problem. Pauline was a wheelchair user and when they built the greenhouse, they put a door at each end so she would not have to do tricky three point turns. This appeared in the greenhouse overlay. Some of the overlays were designed to reflect health and safety with suitable vocabulary, safety messages and pictures of hazards.



In the Garden was shortlisted for a Mencap award and Pam and I had a day out at the House of Lords accompanied by Fred Daly, technical director of the National Council for Educational Technology (NCET), MESU's successor.

Soon after this, the world changed. We got the web, multimedia with its in-built sound and graphics. We got CD Rom, animation and PowerPoint and the last time I saw a concept keyboard, a teacher had pulled it out of a cupboard, draped a tea towel over it and was using it as a tray to carry several cups of coffee from a kitchen to a staff room. You would struggle to do that with an iPad!

The education landscape also changed. The National Curriculum was introduced by Kenneth Baker at the end of the 80s but really kicked in after the Dearing Review in 1994. Teachers were saddled with a heavier admin burden and this limited the amount of time that staff had for creating their own resources for their own classes.

When we look back, we may think that concept keyboard overlays were a little basic, unexciting in design, limited in what they could offer and a far cry from the sophisticated technology of today. But they did represent a key moment in the history of technology. It was a time when teachers, small software companies and government organisations were creating resources that met learners' needs, instead of just competing for a share of school budgets with the promise of better exam results.

With thanks to Jeff Hughes, educational psychologist, St Helens, and Janice Staines, ex NCET and Becta, who filled in some of the blanks in my memory.

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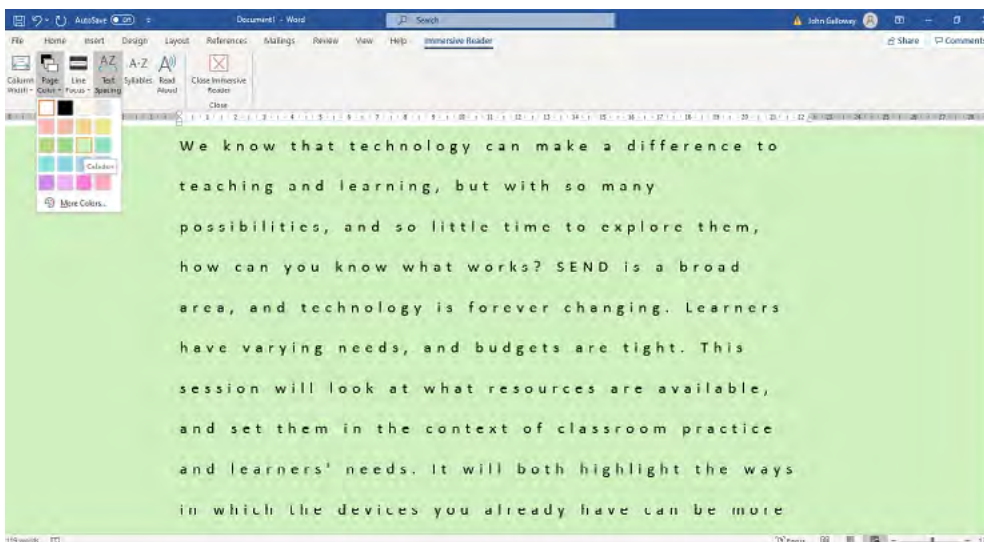
## Tech Tools for Independent Learners

John Galloway



*Immersive reader in MS Word*

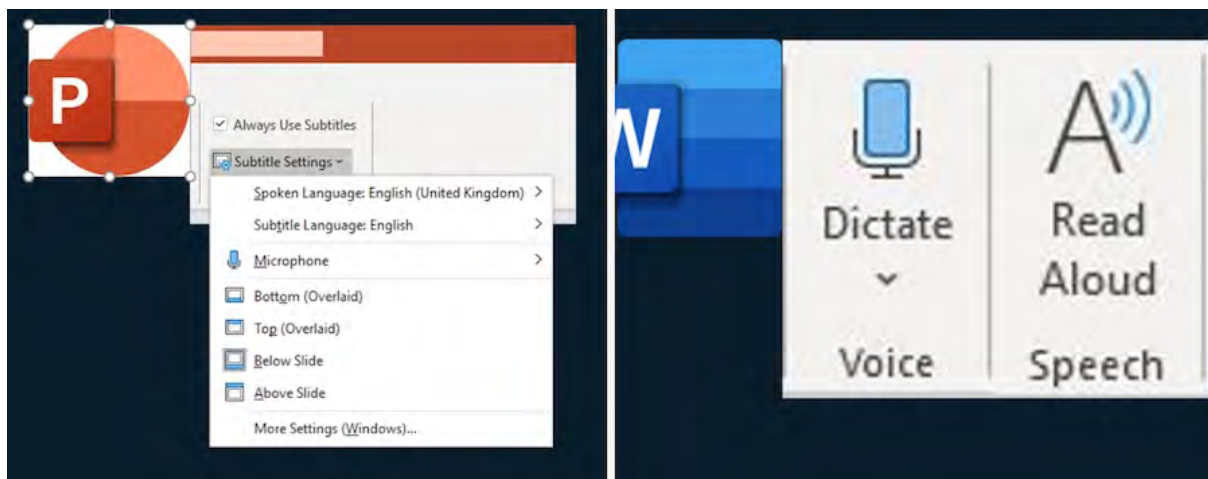
One of the things the pandemic has highlighted is the importance of children and young peoples' capacity to work independently. Those who have shown themselves able to manage their learning, motivate themselves, maintain a focus on the tasks in front of them and to operate with limited adult intervention are the ones best suited to the demands of blended learning and its significant component of online content and communication. There have been, understandably, many concerns expressed about the capacity for those with a range of learning needs to operate in online environments. Not just from the perspective of aspects such as having the necessary literacy skills to engage with materials, but even the ability to get started with signing into lessons and navigating content, or operating devices, to staying focused and completing tasks. Whilst in many ways working online has exacerbated the obstacles to learning significant numbers of pupils need to overcome, it has also highlighted some of the ways in which technology offers supportive solutions, many of which we are all familiar with.



There has never been a better time for technological accessibility with the devices and the apps we now use, for the built-in or bolt-on resources that will provide adaptations and accommodations to improve usage for a range of disabilities and challenges to learning. Every familiar mainstream system, for instance, has built

in functions designed to ameliorate a host of challenges. Text to speech is integral to Windows, IOS and Chromebooks operating systems, and easily available in browsers, either ready to go, as with Edge, or from a plethora of extension in Chrome. (Well established companies such as ClaroRead or Texthelp have very useful toolbars, as does the newly arrived Helperbird). Whether learners are dyslexic, visually impaired, working with English as an additional language (EAL), or even just on the move, the text content of a screen can be readily decoded.

Similarly speech to text can also be initiated from the accessibility options in operating systems - although often the facilities integral to apps, or bespoke software, works better. MSWord now has a microphone icon in its ribbon to enable dictation - along with a Read button for speech feedback - and Google Docs has Voice Typing.



Then there are the options to change the look and feel of the screen to make it easier to read or to engage with the content, whether that is in using high contrast, or removing images and unnecessary content to remove distractions. Helpful for learners with visual impairments or even with ADD/ADHD.

A lot of these are facilities originally designed for accessibility we now regularly use ourselves, whether that is dictating a text on the go, listening to emails in the car, or making the screen easier to see in diverse environments, the options available to learners with special educational needs and disabilities (SEND) are ones we may well be familiar with ourselves. Sometimes, though, we don't immediately recognise that what works for us in one situation can work for our pupils in another. The tools we use flexibly to aid our productivity in our busy lives, can be applied by our pupils to meet many of the learning challenges they need to overcome when they are sitting at home.

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Screenreaders will provide access to texts, whilst dictation will enable responses. Touchscreens and voice control mean that those with limited mobility can operate devices. Changing layouts and removing clutter can make it easier to see and can remove distractions.

Using technology can also change our delivery of lessons, changing the rhythm to create more readily digestible chunks, and to add in other media to aid engagement and understanding.

The tools we use for teaching online are also becoming more learner friendly. PowerPoint now has integrated subtitles, great not just for those with hearing impairments, but also those with dodgy sound on their devices, or who are working in noisy environments. Microsoft Teams and Google Classroom have similar facilities, and Zoom can't be far behind. As you speak the subtitles appear, not always entirely

accurately, but better than you might expect.

The recording functions in most delivery platforms also means that lessons can be available for replay, whether in whole or in part, in a way that would be difficult to bring about in the classroom. Whether learners use these for revision, or teachers edit them to reinforce key points for those who need it, the teaching moment is no longer fleeting, but can be revisited as desired.

Other useful tools include Microsoft's Immersive Reader, available in all their applications and even with an emulator (not produced by them, but apparently with their blessing) for use in Chrome. It helps with understanding texts in several ways. At one level a simple screen mask helps to create a focus on one line – or a limited range – enabling both teachers to direct attention to salient points, or learners to decode without distractions. It is a resource that can be used by teachers as an analytic tool, or learners to grasp meaning and understanding. Beyond that it will read content, analyse parts of speech, change appearance – perhaps marking out syllables or adjusting kerning – and even, in the online version, add symbols as visual clues to the meaning of words.

Overall, what technology can offer learners with SEND is a degree of independence in learning that might be difficult to accomplish in other ways. In a classroom they might have an additional adult to call on, or be able to draw on the services of the learner in the seat next to them to explain what's happening, to read the difficult word, to point out where they are on the page, or to help maintain their focus. As the pandemic brings a greater emphasis to the role of technology in teaching and learning, so it can also lead us to discover ways in which functionality we probably take for granted in our own use, can provide those with challenges to learning tools to greater independence. That has to be a good thing.

### Find out more.

You can find out more about Microsoft Accessibility features at:

<https://www.microsoft.com/en-gb/accessibility?rtc=1>

For Apple at:

<https://www.apple.com/accessibility/>

CALL Centre Scotland provides a wealth of information, such as using Microsoft Learning Tools

<https://www.callscotland.org.uk/downloads/posters-and-leaflets/raising-attainment-with-microsoft-learning-tools/>

Chromebook accessibility and learning tools

<https://www.callscotland.org.uk/downloads/posters-and-leaflets/chromebook-accessibility-and-learning-tools/>

Chromebook apps and extensions for learners with dyslexia

<https://www.callscotland.org.uk/downloads/posters-and-leaflets/chromebook-apps-and-extensions-for-learners-with-dyslexia/>

### Author



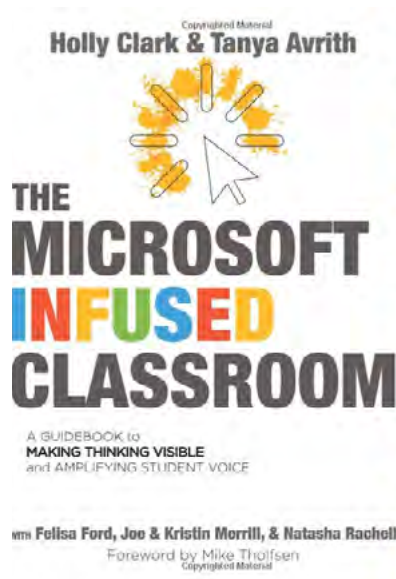
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## Book reviews

### Sail the 7 C's with Microsoft Education: Stories from Around the World to Transform and Inspire your Classroom

Becky Keene and Kathi Kersznowski

Reviewed by Gavin Hawkins – NAACE Board of Management



It is difficult to imagine a more timely and pertinent publication to support teachers wrestling with making online and remote learning relevant. As the education world struggles to cope with restrictions on face-to-face learning and teaching, Becky Keene and Kathi Kersznowski have struck a chord by finding genuinely engaging and impactful activities designed to showcase the tools available to schools who have access to Microsoft Education tools.

The authors stress the importance they place on creating communities of practice for teachers to support each other and share activities which improve outcomes for young people, irrespective of their location.

The book is structured around 7 themes (the 7 C's referenced in the title): Community, Collaborators, Communicators, Creators, Critical Thinkers, Computational Thinkers and Changemakers.

All of us who are engaged in identifying opportunities for real-life context for EdTech can relate to this approach.

The metaphor of “sailing the seven seas” (or 7C's) is maintained throughout the book with reference to “Crew Members”, who are experienced educators with stories to tell and activities to share and also a section entitled “Anchor Points” in each chapter which focus on the key take-aways from each of the themes.

Within the chapters, the authors identify classroom case studies and celebrate the teachers who are implementing the approaches in their classrooms. For example, within the Collaborators chapter we are introduced to activities using OneNote, Flipgrid, Skype and Minecraft from such diverse locations as New Jersey, Labytnangi (Russia), Belgium, Kenya, Wales and the Netherlands. Each of the case studies provides context for the learning, practical advice, links to the schools and educators concerned and QR codes to show the content created or video help files.

Other activities gathered by the authors include recent additions and updates to Microsoft Education such as, Whiteboard and Immersive Reader, which will be welcome to teachers looking to expand the use of Teams, once the initial novelty factor has worn off.

Whilst this is clearly a book aimed at Microsoft Education users, the authors also stress that many of the activities can be undertaken using other platforms or tools and it's really the pedagogy at the heart of good learning, with the platform or applications tools to enthuse and engage.

It is reassuring that at a time of such uncertainty and upheaval, the EdTech community can be relied upon to provide imaginative, engaging, and creative projects which are both impactful and meaningful. And equally reassuring that community members have the opportunity to share their experiences with others through the authors' collation of their stories achieved via this book.

## Exploring Teacher Recruitment and Retention: contextual challenges from international perspectives.

*Tanya Ovenden-Hope and Rowena Passy (Eds) (2020) Oxford, Routledge.*

*Submitted by Professor James O'Meara, Dean College of Education, Texas A&M International University,*



Ovenden-Hope and Passy draw on expertise from across the globe to provide a timely and comprehensive exploration of contextual challenges associated with isolation, teacher recruitment and retention. Part I explores a range of perspectives on recruitment and retention of teachers in England. The authors raise critical questions about shortages and workforce supply in England. Readers will enjoy the well-crafted critiques, research-informed positions, and context-specific discussions about the impact of teacher workforce supply and shortages in England. Part II of the book expands the context contributions to include international perspectives on teacher recruitment and retention. The addition of international authors results in a mix of new challenges and challenges common to all the settings described in both parts of the book. Readers will benefit from learning about the similarities and differences in the language and approaches used across the globe to describe and address issues in teacher

recruitment, preparation and retention. All readers will find much to stimulate their thinking on teacher supply issues. The breadth of topics and the geographic reach of contexts will provoke both connection and disruption. Ovenden-Hope and Passy have provided us with a rich mix of authors who help us think more clearly about the contextual challenges associated with global teacher recruitment and retention.”

–President, International Council on Education for Teaching, US Focal Point, International Taskforce on Teachers for Education 2030

Teacher shortages are widely reported across the globe. Solutions to attract and keep teachers in the profession differ by country, region and in some cases locality. Ensuring a sustainable, high quality teaching workforce is of international concern. Exploring Teacher Recruitment and Retention offers insight into the complexity of maintaining the supply of teachers in England and internationally.

Ovenden-Hope and Passy (editors) bring together expert observations and research on teacher recruitment and retention, illuminating different perspectives on causes and solutions for the crisis of teacher supply. The importance that contextual issues, both within and across a range of national situations, is recognised, which brings a new dimension to understanding the complexity of the challenge of sustaining a qualified teaching workforce.

In summary, Exploring Teacher Retention and Recruitment is written by experts in teacher education in their country, it provides the following: an informed understanding of the similarities in international challenges that result in teacher shortages, allowing for a global response to inform a global solution (as demanded by UNESCO). in-depth discussions of specific contexts in relation to teacher recruitment and retention, such as place-based challenges e.g. educationally isolated, coastal and small schools in England; rural schools in Australia; Jewish and Arab sector schools in Israel.

## News

### A new analysis of Pew Research Center data

*Submitted by Mark Lee and Niki Davis*



The Pew Research Center data has been reanalysed and one of the observations is that 53% of Americans say the internet has been essential during the COVID-19 outbreak. As we have already found in other countries in this Journal, the report indicates that Americans with lower incomes are particularly likely to have concerns related to the digital divide and the digital “homework gap”. The report is worth reading in full but a point about policy stands out. There are partisan differences when it comes to views about the government’s role in ensuring internet and mobile connectivity during this time. Roughly half of Democrats and independents who lean to the Democratic Party (52%) say it is the federal government’s responsibility to ensure that all Americans have a high-speed internet connection at home during the outbreak, and 45% think it is the government’s responsibility to ensure that people have cellphone services. By comparison, smaller shares of Republicans and Republican-leaning independents hold this view about the government ensuring home broadband access (22%) or cellphone services (21%). But before he left office, even President Donald Trump announced plans to address broadband connectivity in future economic relief efforts related to the outbreak.

<https://www.pewresearch.org/internet/2020/04/30/53-of-americans-say-the-internet-has-been-essential-during-the-covid-19-outbreak/>

### A guide to Blended Learning

*Martha Cleveland-Innes with Dan Wilton, Athabasca University, Canada*

*Commonwealth of Learning; Submitted by John Sibbald*



In the current pandemic there are many valuable lessons in this free guide to blended learning. Perhaps the most telling is the detailed information in this guide which also links to video. The authors point out that a good learning environment is a true blend of learning content and interactions of various types, leading to



authentic learning experiences. Technology has made it possible to provide a diverse range of learning resources and interactions to enhance student learning in both distance and campus contexts. Typically, a blended learning course will have components of both online and face-to-face teaching and the context will determine the proportion of the blend. This guide is valuable because it provides teachers with a framework to design and develop courses with online and face-to-face components, to offer the flexibility for addressing different learner preferences.

[http://oasis.col.org/bitstream/handle/11599/3095/2018\\_Cleveland-Innes-Wilton\\_Guide-to-Blended-Learning.pdf?sequence=1&isAllowed=y](http://oasis.col.org/bitstream/handle/11599/3095/2018_Cleveland-Innes-Wilton_Guide-to-Blended-Learning.pdf?sequence=1&isAllowed=y)

## Implementing valuable research findings in today's global classrooms



### *MESH invited to join UNESCO International Task Force on Teachers for Education 2030*

Too often busy teachers do not have time to read research findings about effective forms of teaching and learning, particularly about making online learning more attractive in these days of Covid. Many of these important studies have been researched by teachers themselves, but they are written up by academics in a style that is not easy for teachers to read, even if they have access to the academic journals where they are published.

Naace members may already now about MESH, a professional organisation that aims to tackle this issue by making research easily accessible to teachers through its Mapping Educational Specialist knowHow website. This bank of research summaries will now have global reach because MESH has been invited to join the UNESCO International Task Force on Teachers for Education 2030, also known as the Teacher Task Force (TTF). This unique partnership was created in 2008 as advocates for teachers and the teaching profession around the world. It is dedicated to raising awareness, expanding knowledge and supporting countries towards achieving the United Nations Sustainable Development Goal 4, target 4c to substantially increase the supply of qualified teachers worldwide by 2030.

The MESH approach is a good fit in this alliance because it offers a sustainable method for collating resources already in the education system so that evidence-based research summaries for teachers can be quickly and easily created. These updatable research summaries, the MESHGuides, are developed by teachers and researchers in collaboration to inform schools leadership teams about strategy and practice within the classroom.

The TTF has over 140 members (including national governments, international organisations, international NGOs and CSOs and foundations) working together to ensure there is a qualified, motivated and empowered teacher in every classroom. MESH is honoured to have been invited to join this important initiative for education worldwide.

*Further information from*

[@meshguides](#) [@sarahyounie](#) [@MarilynLeask](#)

## NCUP annual lecture 18 February 2021



### ***A New Vision for Higher Education Post Covid-19: From Policy-Takers to Policy-Makers***

#### ***Sir Anthony Seldon***

This year, due to COVID-19 restrictions, our annual lecture was delivered virtually; 48 people attended including NCUP members and affiliates and members of the general public.

Introduced by NCUP President, Janet Wilson, as 'a man of many parts', Sir Anthony Seldon, historian, educator, author and recently retired Vice-Chancellor of the University of Buckingham addressed the gathering on the post-COVID landscape for UK universities. Initially asking the question about what an ancient university such as Oxford and one of the newest universities, the University of the Highlands and Islands does, Sir Anthony surveyed the range of influences in terms of funding, policy and politics that impinge on UK universities. Pointing to the lack of a clear UK Government strategy for higher education, his thesis was that the HE sector has, increasingly, become the end-product of educational policy rather than the collective voice forming this policy. The balance, he argued, should be shifted towards UK universities becoming more active policymakers regarding their own destiny. This problem, reflecting vocational or economic priorities rather than educational or research ones, was apparent pre-COVID, but the pandemic has added an additional dimension with implications for the delivery and the cost of UK higher education.

UK universities are usually reported in the media for the wrong reasons. In Sir Anthony's words: 'So often though, it is the bad stories, of students fenced in, speakers banned from talking, and excessive VC pay that make the headlines.' However, 'Universities, despite some lurid headlines, have done a really good job keeping teaching, research and learning going during the lockdown. They have great stories to tell.'

Using an A to W of '24 Challenges' as his guide, Sir Anthony covered, among other things, challenges such as the impact of the pandemic, the value of Chinese students to our educational economy, access to BAME and other underrepresented groups, mental health of students and the question of free speech. With direct relevance to the pandemic, which has seen UK universities make a very successful transition to distance and online learning and teaching, Sir Anthony emphasised how they should now make this mode of education a driver in taking the lead. He concluded that these issues were as important for the Oxford and Cambridge and the red brick universities as for the University of the Highlands and Islands.

*You will find the full lecture here:*

<https://www.hepi.ac.uk/2021/02/22/anthony-seldon-from-policy-takers-to-policy-makers/>

ISBN: 978-1-5136-7486-5



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