Element 18

Technology & Digital Platforms

Technology should be like air – invisible, vital and ever present. It cannot be the driving force of change because it continues to evolve, but should always support change. A learning community should flow between the real and digital world seamlessly, providing continued support for lifelong learning.

Technology & Digital Platforms

Technology in education should be like air – invisible, vital and ever present. Technology should not be placed as the driver of change; but it should always support change. As technology also continues to evolve continually, there is no point in viewing current technology as an endpoint, rather another step towards further innovation. Learning ecosystems should utilise the opportunities afforded by technology, so that a learner can readily flow between the real and digital world seamlessly. There is no doubt that technology will support the concept of lifelong learning in multiple ways.

The applied use of technology has the potential to accelerate personal growth in learning and enable it to happen anywhere, anytime and anyhow. Technology has the ability to keep people immediately informed with relevant data, updated information - and very importantly, able to access learning opportunities no matter where they are.

In historical terms, most education systems are yet to fully reap the benefits of technology. Some of this is to do with equity and access, but much of it is connected to limited thinking around new technologies and an unwillingness to move away from existing (traditional) paradigms.

EdTech companies have also been either a help or a hindrance. Many products (hardware and software) have flooded the market and created the notion that technology is what will improve educational outcomes. Technology has been positioned as the solution to pedagogic innovation, when the reality is that learners need to take responsibility for their learning in order for sustained progress to be made. Constant updating of technology has meant that it is all too easy for schools or governments to invest in technology that is rapidly outdated.

Then	Now
• Mastery of basic skills & knowledge delivered by an expert • Factory model of schooling; physical classrooms • Textbooks and encyclopedias	• Seemingly unlimited knowledge available via the world wide web • Learning anywhere, anyhow, anytime • Internet-based information & wikipedia

Starting Questions

1. What different technologies are being used to support the learning in your community? Do all students/learners have equal access to the technology, or is it dependent on the expertise of the teacher?
2. From an information and communication perspective, how reliant is the school on outdated information?
3. Has effective technology been adopted to streamline administration and student information?
4. How might more pervasive access to technology improve educational access, equity and opportunity?
5. Does the school have a 'guiding coalition' in relation to technology?
6. Who drives the technology choices for the community?
7. Is the power of data to track learning being sufficiently leveraged?

8. Would an audit of all existing technologies be helpful?
9. Over the last 5 years, has budget been allocated to technology that is either not used or redundant? Has an institution-wide audit been conducted?
10. Does the professional learning programme adequately address the need for teacher training in relation to new and diverse technologies?
11. Is there someone at senior leadership level who takes responsibility for the purchase, deployment and use of technology?

Key Initial Actions

1. Assess who is responsible for the technology use and professional development in the school? Is there a team supporting that person?
2. Conduct a technology audit: where is the technology in the school? Is it being used? What is the quality applied use of technology across the school? Is it consistent?
3. Does a child's access to technology or use of it depend on random allocation of teachers or is it consistent across campus? Assess consistency and access - and develop a strategy to maximise both.
4. Identify the best people suited to drive the applied use of technology and create a team approach.
5. Ensure that technology needs (hardware, software and human resource) are adequately met
6. Critique existing software and hardware. Is it the best software for the purpose?
7. Consider well-being emphases and technology use. Are they compatible? Has technology enabled any degree of a negative culture?

On-going Actions

1. Maintain an active team (guiding coalition) to lead the integration of technology for the long term.
2. Ensure the close crossover of people with tech skills (probably tech specialists, not teachers) and the teachers who can lead the pedagogic directions that includes technology enhanced learning opportunities.
3. Ensure support for the early adopters and change makers on the team.
4. Update the vision for the use of technology on at least an annual basis, given the changing nature of available hard and software.
5. Critically evaluate technology from the perspective of whether it encourages a shift to more student-centred learning or whether it might simply reinforce older style teacher-directed methodologies.

Further Reading

7 Ways That Digital Technology Is Changing The Face Of Education

How Technology has Changed the Face of Education

10 ways How Technology has changed the Face Of Education

The role of technology in the education of the future

Why technology is failing to change the face of education

How technology can bridge the skills gap it created

How can technology improve school education?

Top 6 Reasons Why Students Prefer Digital Content

Technology and Ubiquitous Learning

Find out More

Technology has had a profound influence on education since its inception in the 19th century. The invention of the radio by Guglielmo Marconi in 1895 and subsequently the television by Philo Taylor Farnsworth in 1927 offered leaps forward for learning, enabling information to be transmitted to schools and homes from remote locations. These technologies were perceived both positively and negatively - the positive impact being their benefits for innovation and progress, and negativity stemming from the fear of dissolved relationships and our ability to interact effectively.

The course of technological progress consistently provides positive advancement matched with societal disquiet and fear. The invention of the personal computer by Henry Edward Roberts in 1975 raised similar doubts to its technological predecessors - and new inventions in artificial intelligence stir fresh moral debate today.

Worrying trends, 1906. Reproduced with kind permission of Punch Ltd., Image: Punch Ltd | www.punch.co.uk

While concerns are unavoidable, hindsight reveals that how we decide to utilise technology is crucial to advancing human evolution - it can improve lives. Technology offers similar advancements in education if done thoughtfully, skillfully and with ethical progress at its core.

The table below, featured in a World Economic Forum report[1], demonstrates the incremental changes and progress to learning made possible by technology from the first industrial revolution to the present.

	First Industrial Revolution	Fourth Industrial Revolution
Learning Objectives	Mastery of basic skill and knowledge (e.g., reading, math)	Development of whole person across multiple intelligences (e.g., emotional, intellectual, social)
Role of Educator	Expert	Facilitator
Learner Experience	Factory Model - Passive, structured, directed, en masse	Custom model - Active, self-directed, exploratory.
Target Age	K-12	Lifelong learning
Expertise	Teacher knows best	Anyone can teach
Access	Physical Classroom	Anytime, anywhere, any device

If education is to fully embrace the fourth industrial revolution and serve its learners, it must fully commit to embedding technology into the policy and design of learning frameworks that befit a new era.

Key Ideas

1. Technology and digital platforms can advance learning design and delivery when properly embedded.
2. Education systems are yet to fully reap the benefits of technology.
3. Technology and digital platforms should support learning, not drive it.
4. Learning communities that promote and use technology and digital learning platforms are reimagining and reinventing their use of space.
5. Learning environments must remain agile to keep up with continued technological advances.

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[1] How technology can bridge the skills gap it created

Questions

- Does the learning community use technology to support learning or is technology the sole driver of all learning?
- How does the learning community make decisions on the technology it uses?
- How does the learning community improve learning frameworks and learning opportunities with technology?
- How has technology aided the development of learning spaces in the community?
- What does the learning community do to ensure its students are adequately prepared for the ever-changing technological world they will enter into after formal learning ceases?

1. Technology and digital platforms can advance learning design and delivery when properly embedded.

Technology has changed the goalpost for education - authentic and bespoke, individual-focused learning is now possible. The impact of technology on learning is not just from emerging software developments, but from the knowledge economy which we live in. In the past we relied on teachers to disseminate information that was absorbed and subsequently regurgitated to measure learning. Today, technology provides an endless ocean of knowledge. Educators can reimagine their duties, not as sole disseminators of information - they no longer need to be - but as facilitators who bridge the gap between content and the acquisition of skills and competencies.

The technology that is available to students today means a new dynamic for teaching and learning has emerged. Content can become the fuel to drive a learner's passion and purpose, offering intrinsic motivation in one learning space, seamlessly and synchronously. Technology does not render the role of the educator obsolete - in fact, educators now potentially play a more critical role in light of emerging learning complexities. Learners must be guided by educators to advance their skills and competencies - with a focus on key skills such as innovation, collaboration, communication and critical thinking - human interventions that machines cannot deliver.

> ***'Computers are useless. They can only give you answers.'***
>
> *Pablo Picasso*

With technology to support learning, educators no longer must spend valuable time searching for content. They can devote their energy to the cognitive processes of learning and develop dynamic, holistic opportunities that broaden the experiences of their students. Any learning resources designed by educators can be stored in an online cloud and adjusted if and when required - so improvements to learning design does not mean beginning again each time.

Technology improves learner differentiation - a difficult and time-consuming process for educators to address given the uniqueness of each learner, each with unique strengths and areas for development. Technology enables learners to pace learning according to ability, while educators can accurately monitor progress and attach effective feedback and growth mindset strategies to assist. Learning this way is more personal, user friendly and accessible to all. Technology can advance human connections by fostering empathy, enabling appropriate support, and increasing the quality of educator-learner interactions, which strengthens relationships and helps grow a strong learning culture.

2. Education systems are yet to fully reap the benefits of technology.

Unfortunately education lags behind harnessing the potential of technology - this has been an ailing symptom for many years. A plethora of edtech companies on the market currently sell software and digital platforms that have simply redesigned traditional textbooks or content providers disguised by novel flashes, frills and colours. These companies, often guided by government curricula, produce content-heavy resources and deceive us into believing they support an emerging paradigm for learning. Some providers may link data or instantaneous feedback to their platforms, easing the burden of administrative duties for educators, but this does attach the science of learning to technology.

The use of technology like this continues to support learning from yesterday and does not reimagine pedagogy for today, which is ultimately what edtech companies must set their focus on to appropriately support a new learning paradigm.

Edtech providers, if they wish to propel learning into a new era, should produce a platform that provides a highly individualised learning experience - one that offers cognitive learning opportunities beyond content and towards supporting new learning relevant for the 21st century. If technology on-demand has found its place in popular culture, then edtech must create the same on-demand service for educational culture - the type of service that netflix, facebook, instagram and even fast-food outlets are providing for their consumers.

Algorithms, although rife with moral pitfalls, can support learning's new potential. To some degree they guide learning, but their functions are commonly limited to providing data for traditional, rote learning assessments. A tech company that can use algorithms to display individual KPIs that measure capacities, preferences, strengths and behaviours, could essentially provide bespoke learning experiences that educators could use to monitor and support individuals and provide a more holistic learning experience fit for 21st century purpose.

Algorithms potentially remove the pressure on teachers to unlock learning blockages through manual observation or by guessing ambiguities that naturally arise when perceiving the nature of any student. Algorithms can potentially leverage the science behind learning, and better equip educators with the necessary data to support every learner, ultimately creating stronger pedagogical experiences for all.

3. Technology and digital platforms should support learning, not drive it.

Given existing technologies available, it is possible to create learning design experiences that can support all individuals in a learning community. It is still however the iteration stage of having a single digital learning platform that supports learning for every individual. In the current status quo, using varied technologies is the best method to address and deliver an effective learning support mechanism. But technology should always support learning, not drive it, and it should provide the following functions:

- **Instant access to information**
  When students are empowered to find their own content, it removes the burden on educators and challenges the learner to take ownership over their learning. Information chosen can be individually suited - this could be animations, audio, video or written word.
- **Track student progress**
  This goes a long way to help guide educators towards suitable learning paths for individuals and can increase the authenticity of experiences.
- **Access to instant support online**
  Students don't necessarily have to rely on their educator to be the sole influencer of their learning, nor the only expert available to them.
- **Increased valuable class time**
  Instead of educators spoon-feeding knowledge, instant access to information enables them to jump straight to the core of learning - problem-solving, critical thinking, innovation, collaboration - high order skills that can better serve learners for their future.

- Leverage collaboration
  Online learning platforms provide ongoing dialogue outside of class contact times which supports peer to peer guidance, deeper learning and access to experts in specific learning areas. Embracing technology's full potential offers a new formula for collaborative communication that can better suit learners with specific personality types.

> ***'One machine can do the work of fifty ordinary men. No machine can do the work of one extraordinary man.'***
> *Elbert Hubbard*

4. Learning communities that promote and use technology and digital learning platforms are reimagining and reinventing their use of space..

A new learning space - the digital space - is increasingly growing in popularity, and its implications to produce learning without borders eradicates the existing frontiers between classrooms, schools, districts, nations and continents - helping create a global online learning community.

This new digital space creates flexibility for learners, helping determine the place, pace and mode which best suits them. The virtual learning environment (VLE) is becoming as important as the physical space. The digital learning space is a network that offers mobility, collaboration and individual learning opportunities synchronously. Students in a new learning paradigm must be able to move seamlessly between the real and digital worlds instantaneously.

> ***'What's interesting is that as learning is becoming more virtual, the virtual activities are actually becoming more physical. One might say virtual and physical are meeting in the middle.'***
> *Andrew Kim Steelcase, WorkSpace Futures*

Technology, once implemented, can lower learning costs drastically - it is an investment that will pay off not just financially, but pedagogically as well. The points below highlight some key implications technology will have on budgets and learning:

Resources
The procurement of older resources - posters, text books, or anything physical, is fast becoming the expensive alternative to online learning materials. Physical resources often have a shelf life, or once damaged, are generally useless. Digital learning resources such as apps and software platforms can be updated at no extra cost - this provides a continuum of relevance.

Online Classes and Programs
As online learning becomes increasingly widespread, the cost of digital providers will continue to decrease. Free online classes provided by Massive Open Online Courses (MOOCs) offer new learning alternatives. MOOCs are available from anywhere and connect people all over the world.

Distance learning
Distance learning removes location and time restraints which previously limited learning opportunities. Individuals can access support or courses from home or in transit. This has increased student enrolment. Distance learning helps individuals plan learning to best suit them and offers a broad pathway for success.

5. Learning environments must remain agile to keep up with continued technological advances.

If technology is to remain relevant in education, then learning environments must stay agile and embrace the new trends that are replacing old ones. Education must position itself as a frontrunner for innovation, similar to businesses - using technology and digital platforms to enable students to be future ready for the demands of the 21st century. Ultimately, educators and tech providers must unite to provide opportunities that attach learning science to digital platforms - and educators must use technology to leverage the skills and competencies of their students.

Technology must support and promote learner agility by becoming an on-demand service which provides help for users when it suits them. In this way it becomes ubiquitous - learning which is either virtual or physical by choice - with one medium supporting the other. And as technology continues to evolve, humans must control how it is used, not the other way round.

We are truly on the cusp of a learning revolution. Technology can be a beacon which brings forth welcome change and a new age for pedagogy. As educators, we must use it to take action, and not just be a passive observer of its content. It is a case of becoming the innovator or inventor, not just the benign viewer or player.

Act Now

Using technology to support learning can change the format for pedagogy and impact an organisation's overall culture. Implementing change arouses several questions which must be carefully considered by educators, leaders and other stakeholders who shape the learning community:

- What do our learners need?
- What is our budget?
- How can our learning community support virtual and physical spaces seamlessly?
- What will be the return on investment? (not just monetary)
- Is the technology that we invest in going to be obsolete and incur further costs to update soon after implementing?
- How is technology going to alter our organisation's culture?
- How is technology going to alter pedagogy?
- How is technology going to alter the role of the educator?
- Do we need to provide training opportunities to embed new technology?
- How can we reimagine learner design with technology and digital platforms to support it?
- Are our educators equipped to cope with radical changes or should we plan to foster change incrementally?
  **Questions not stated above might also arise in your learning context.*

The more stakeholders involved in the design-thinking phase, the more likely the community will contemplate the critical components of change that make the prototyping and integration phases more smooth.

Embedding new technology and digital platforms is a hugely important project and requires consideration of the following points during the stages of integration:

1. Consider a variety of platforms

Currently, digital platform providers have not adequately built one overarching system that covers all the principles that a learning community should provide for its learners. The following areas should be covered by technology: feedback and learning recommendations, communication and collaboration, skills and competencies, differentiation, active learning and methodologies and creativity and innovation.

2. Do not let tech take over

Educators and facilitators should still be the key driving force for change - motivating, inspiring and guiding their students towards the choices that they can make to become holistic, self-determined, lifelong learners. Technology should support this journey, but educators should always have control over what they feel best supports the learner.

3. Design your space appropriately

Learning spaces should be designed to provide seamless shifts between the virtual and physical space and set up to include asynchronous opportunities for individual and group learning and support for individuals through the presence of educators, experts or the learners themselves guiding others in peer contexts. Ultimately the learning space must provide learning that suits anyone at any time.

4. Use tech as a support tool

Learners today are comfortable communicating silently using text messaging - this is becoming a social norm and instead of denigrating it, we must embrace it as a new communication support technique. Text messaging can be used to seek and offer learning support and set up dialogue that some people find awkward in face-to-face contexts. It can serve to initiate physical interactions for the future that can enhance any learning network.

5. Embed digital literacy into your community

Digital literacy, like traditional literacy, is a subject and concept that learners must be trained in and made aware of to increase the quality of digital learning experiences. The following skills should become a focus for learner design experiences:

- Digital citizenship
  Using digital technology and media in safe, responsible and effective ways.
- Digital creativity
  Going beyond the content consumer to co-creating new content and turning ideas into reality using digital tools.
- Digital entrepreneurship
  Using digital media and technology to solve global challenges or devise new creative opportunities.

6. Stay relevant

It is crucial to keep up with new trends and contemplate new investments based on what might be important for your learning community. Set your sights on what might support and advance societal progress and catalyse new behaviours that learners of today ought to be exposed to.

Examples in Action

Technology and digital platforms almost unconsciously permeate society and culture. The most effective online platforms offer a virtual extension to our physical lives and can improve our capacity for personal development. The digital platform can become an extension of schools and learning organisations, increasing the capability for merging physical and virtual learning experiences.

Digital platforms

MOODLE

Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments. Powering tens of thousands of learning environments, Moodle is trusted by global institutions and organisations large and small.

MOOC

Massive Open Online Courses (MOOCs) are free online courses available for anyone to enroll. MOOCs provide an affordable and flexible way to learn new skills, advance your career and deliver quality educational experiences at scale.

iNACOL

iNACOL are a forward-leaning, dynamic organization committed to pushing and leading the field beyond incremental improvement toward transformation, inspired by domestic and global innovations and advancements in learning sciences and technologies. The mission of iNACOL is to drive the transformation of education systems and accelerate the advancement of breakthrough policies and practices to ensure high-quality learning for all.

Online & Distributed Learning

In this style of learning, students can connect with their teacher from anywhere in the world on their own schedule and their own terms. Teachers use a wide variety of electronic tools to teach their students, including voice and video conferencing over the Internet, email, telephone calls and others. Students can choose to complete an entire program via distributed learning or partner it with other learning options like in-person classes, blended classrooms or homeschooling.

Gnowbe

Gnowbe replicates the workshop experience into the mobile app to empower learners to learn, think, apply and share. It launched the very first accredited mobile learning library in the world.

BYJU'S

BYJU'S is India's most loved school learning app in India. BYJU'S offers highly personalised and effective learning programs for classes K-12, and aspirants of competitive exams like JEE, CAT, IAS etc. The BYJU'S way of learning provides students a learning platform where they can learn, engage and be excited about charting their own path to discover the world. BYJU'S - The Learning App brings together the best teachers, technology, content, media for creating a seamless, world class learning experience for each and every student.

Cisco

An online networked teaching and learning platform of education, instructor, training and employment organisations. Cisco is in partnership with 26,500 educators at over 12,000 academies and work with educators and instructors all over the world to deliver the best curricula for today's world.

Schools

BC Online School

BC Online School offers the opportunity to learn at any pace, any place, any time. Learners can take courses that meet graduation requirements at no additional cost while still enrolled in another school. BC Online School offers courses which range from basic graduation to university entrance requirements.

Further reading

New technology has changed the face of education

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How Technology has Changed the Face of Education

10 ways How Technology has changed the Face Of Education

How Technology Is Changing Education

The role of technology in the education of the future

Why technology is failing to change the face of education

8 digital life skills all children need – and a plan for teaching them

How technology can bridge the skills gap it created

How can technology improve school education?

Is academia losing its chance to capitalize on technology?

Top 6 Reasons Why Students Prefer Digital Content

Education should be like everything else. An on-demand service.

Technology and Ubiquitous Learning

Is digital technology changing learning and teaching?