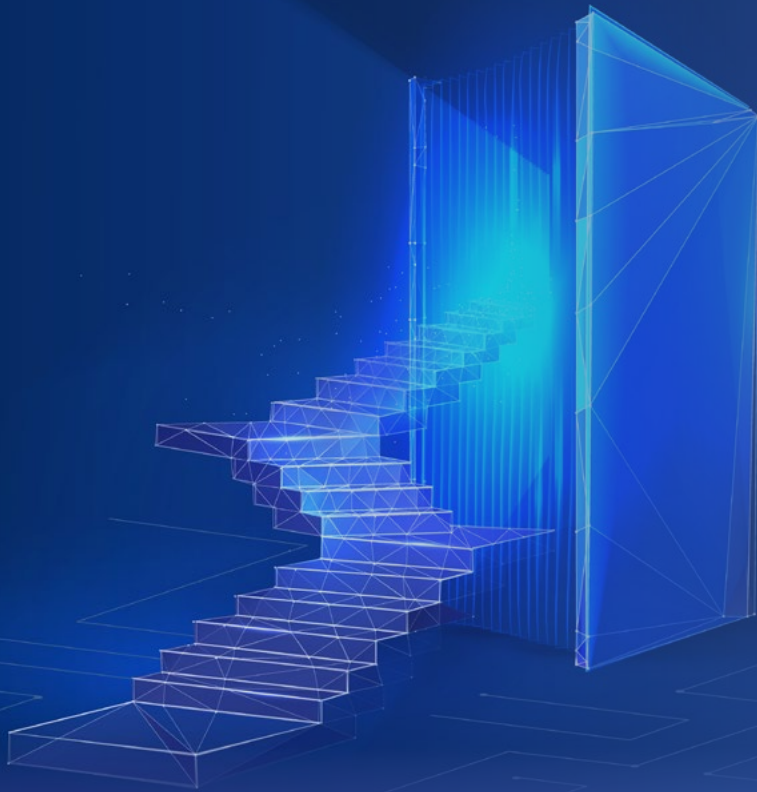**FEDERATION OF AWARDING BODIES**

Gen Z & The Future of Learning in The Metaverse

Foreword

My teenage son hates it when I refer to his career plans as becoming a digital nomad. To him, it's total cringe. Exactly the kind of thing a 'boomer' would say. Between us, I'm *actually* Gen X.

Behind this intergenerational case of cognitive dissonance, there's a serious point.

The way my children relate to the process of learning and choosing a future career is completely different from how my cohort reacted when faced with a similar challenge.

In the 1990s, opportunities in mass higher education began to open up. And working-class kids seized them with both hands.

I was born in the analogue era. On demand had not been invented yet. The metaverse was an alien world. Only three or four linear TV channels existed in the UK. And calling your girlfriend meant agreeing, at least in those days, exactly when you'd be waiting by the shared house telephone to talk to one another.

Now I'm in my fifties, I'm often struck by how similar the country looks to the Britain of my youth. This ancient land undulates in a patchwork of green and golden pastures, shifting with the four seasons, as it has always done.

Don't be deceived. Continuity, diversity and difference are still what define us as a nation.

In our towns, I look up at our architectural heritage and I see ancestors: Saxons, Normans, Tudors, Georgians, Victorians, Edwardians, pre-war and postmodern influences.

It brings my soul comfort. A kind of reference marker that my generation's existence is no more than a footnote in this island's long and beautiful story.

But it's also a stark reminder that change is constant.

Today's real change makers are Gen Z, in contrast to those like me, who were taught by the second world war generation.

Of course, as an educationalist, there's much I still recognise about the contemporary process of teaching and learning. As the late Ken Robinson would often bemoan, large parts of our education system today are still stuck in the nineteenth century.

Too many people are held back. Educational attainment has become a byword for creating excellent sheep.

This report, written by futurologist Tracey Follows, sets out why we shouldn't be so despondent. Seismic change is coming.

The pandemic was the earthquake. The aftermath – exploring where we go next.

I would encourage everyone involved in education, awarding and assessment to think beyond the linear. Digital has replaced analogue. The complacent will soon be obsolete.

Qualifications are changing too. Regulation has its place, but so do the disruptors. The future of learning is with individuals, not institutions. The role of teachers is to instil a love of discovery, not impose a straitjacket of rote learning.

Examinations have their place. As do other forms of valid assessment. Human flourishing, however, is the real purpose of education. Skills for work helps pay the bills. Vocation is how we unleash everyone's human potential.

What makes me so in awe of geniuses like Leonardo da Vinci and Albert Einstein, is not their celebrity. After all, that was assigned to them by subsequent generations well after their deaths.

In their own lifetimes they were proper rebels – subverting the systems around them. We need more of them.

Da Vinci was considered a heretic by the church for believing what Copernicus put beyond doubt a century later: the earth rotates around the sun. And Einstein observed that the pursuit of knowledge was futile without imagination.

Gen Z – the people leading our world in less than two decades time – already have very different expectations about careers and work from what went before.

As Abraham Lincoln once said: 'The philosophy of the school room in one generation will be the philosophy of government in the next.'

The FE and skills ecosystem can be a part of the solution. But it has a real job of work on its hands to properly prepare. Group thinkers need not apply.

Professor Tom Bewick
Chief Executive, Federation of Awarding Bodies
20th October 2022

The Issue and Opportunity

At the Transforming Education Summit in September 2022 at the UN General Assembly, New York, leaders from around the world met to confront what they called 'a global learning crisis.' Their goals: to help every child get their future back on track post pandemic, rebuild lost trust in public education systems, and persuade Heads of State to commit to radical change.

Not an altogether surprising list of aims, given 1.6 billion students were out of school globally at the peak of the pandemic. The World Bank has reported that today's student generation risk losing $17 trillion in lifetime earnings in present value (or about 14 per cent of today's global GDP) as a result of Covid school closures.[1] The share of children in learning poverty has risen from 53% pre-pandemic to potentially as high as 70% globally. Even in the UK, it's feared that around 10 million children will never return to school.[2]

Perhaps it's no surprise then that radical change in education is not happening top-down via politicians, but bottom-up via startups.

It's the entrepreneurs, technology platforms, Web 3 and metaverse pioneers, gaming companies and entertainment brands that are reinventing education. They're piloting new ways of learning and creating new routes to skills-based rewards and recognition.

Drivers of Change

Learning not Teaching

'The pandemic made many parents and students realise just how much learning we could do for ourselves at home' says Jo Redfern, an expert in educational entertainment for kids. It highlighted the sheer volume of educational content out there, encouraging parents to adopt a more proactive approach towards their children's learning.

Big hitting Youtube shows like **OverSimplified**, **SciShow** and **MrBeast** proved that strong storytelling was key to driving educational engagement, while gamified language learning apps like **Duolingo** highlighted the importance of adventure and reward in remote learning.

They show us that the 21st century is entrepreneurial rather than industrial. Today, knowledge is less hierarchical and more peer-to-peer networked, meaning that most knowledge is already at students' fingertips. This has led to a fundamental cultural shift: the teacher is no longer the default centre of the educational model.

Knowledge is now on-demand, with the learner at the centre. Mind you, the democratisation of knowledge doesn't guarantee a good education. As the saying goes, *'knowledge is knowing a tomato is a fruit, wisdom is knowing not to put it in the fruit salad'*.

In a reputation economy fueled by social media, knowledge is often judged on the authority, acceptability and likeability of the person sharing it. But how can we tell if that 'knowledge' is based on fact, or has been tested by reality? Increasingly, we can't. What learners are missing now are the means to properly assess this knowledge and understand how best to apply it.

Media as Classroom

In his essay, "Classroom without Walls", Marshall McLuhan wrote *'Before the printing press, the young learned by listening, watching, doing – rural children learning the language and skills required from their elders'.* [3]

That's to say, most learning took place outside the classroom. He points out that this also holds true in a world of mass media: *'The sheer quantity of information conveyed by press-magazines-film-tv-radio far exceeds the quantity of information conveyed by school instruction and texts. This challenge has destroyed the monopoly of the book*

as a teaching aid and cracked the very walls of the classroom so suddenly that we're confused, baffled'. If we were confused in the 1950s, the age of the internet, streaming services, multiplayer gaming, avatars, and immersive media like virtual reality have only added to our collective bafflement.

The mobile phone is perhaps the main portal to that world, but we're often confused as to whether we should embrace the device or reduce screen time for students. As Ger Graus, Global Education Adviser stated, *'Nobody will ever hear the phrase in a lesson: get your phones out, let's go and travel. They might hear get your laptop out and I'll tell you where to go'.* However hardworking and engaging teachers might be, the curriculum is a recipe for prescription rather than exploration.

Future of Work

As the Fourth Industrial Revolution beckons, much of the education system still echoes with the Victorian worldview of rote learning as preparation for managerial or practical jobs in an industrialised workforce. But with technology underpinning nearly every single future job, the gap between education and employability is growing.

Olly Newton, Executive Director of the Edge Foundation explains *'a large and growing proportion of the curriculum is rote learning, and very little focuses on creative problem-solving unless individual institutions work really hard to integrate that into their pedagogy. This is largely at odds with the direction of travel in other parts of the world'.* [4]

Ger Graus reminds Generation X and Boomers that *'Billy Connolly talked about going to school in Glasgow and at the age of 14 years leaving school. As the school gates closed, the gates to the shipyards on the Clyde would open...you just moved from one to the other.'* In fact, 80% of work experience is still sourced by parents when students are college age. That can hardly be the best way to match the right people with careers.

The World Economic Forum estimates that 40 million skilled workers are needed worldwide to solve the global talent shortage, with 3 million new tech roles needed by 2025 in the UK alone[5]. Generation Z (born between 1997 and 2012) and the generation that follows, Generation A (many of whom are yet to be born) will be able to work from anywhere in the world, thanks to remote working in a digitally immersive economy, often referred to as the metaverse. The current educational experience doesn't adequately prepare them for it, nor does it direct the most skilled students into the digital jobs where they'll be needed most.
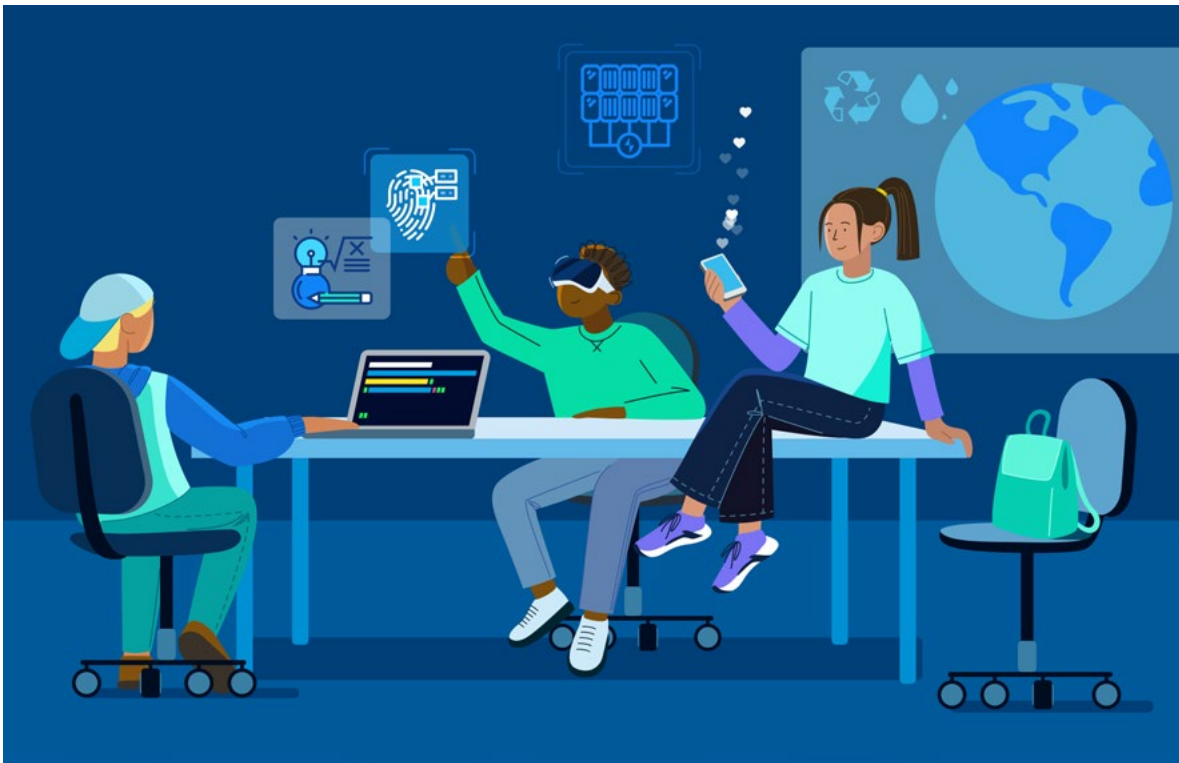
Gen Z (zoomers):

A demographic cohort that comes after Millennials and before Generation Alpha – born between 1997-2012 (the youngest are only ten years old now and the oldest are 25 years old). Many are now entering the workforce for the first time. For some, that has meant virtual onboarding with remote working from the beginning of their careers.

Often referred to as 'digital natives', they may be characterised as more risk-averse than previous generations. They're certainly more globally connected and more politically and ecologically active in areas around social justice. It's been said of Gen Z that they spend more time on digital media and less time reading books, and concerns have been expressed about the effects of technology on their attention spans, vocabularies and to an extent on their mental health. Conversely, they're leading the way in world-building –reinventing learning through TikTok, creating immersive environments to explore their multiple identities and realities, and highly valuing products and services that are personalised. In summary: they are anything but passive learners.

Entertainment as education

As McLuhan notes in "Classroom without Walls", *'it's misleading to suppose there's any basic difference between education and entertainment…'* In essence, whatever pleases, teaches more effectively. And nothing pleases the young like on-demand TV on **Netflix**, broadcasting apps like **YouTube**, or gaming communities on **Twitch** and **Roblox**.

Why is gaming so effective as an educational vehicle? Characters engage learners in storytelling, kids enjoy the learning experience, which in turn increases their intrinsic motivation to learn. Kids learn because it's fun. And because learning becomes fun, they want to keep going.

On Roblox, a platform with 40 million games and counting, it goes beyond traditional education to stretching their problem solving and creative skills. According to Jo Redfern, a content strategist for many successful youth brands, there are over 50 million daily active players on Roblox and 25% of them are under the age of nine. *'Some of the games can be very simple, like building a hospital and then role playing as a patient or a nurse'.*

In 2021, Roblox launched **Roblox Community Refund**, geared towards expanding their educational programme, providing $10million in funding to support educators using Roblox Studio in their classrooms. That might be to create a game like **Math Obby** or design a virtual museum exhibit, like **The Keeper Council** with the National Gallery. Jo explained that her own children had used gaming platforms to do everything from visit the international space station to roam around ancient Egypt.

Purpose Learning

The Stanford 2025 Report flagged this newly emerging model some years ago. In the past, students declared their majors and focused their studies on a fixed set of requirements. More recently, they've begun to declare missions and pursue the purpose that fueled them.[6]

In practice, this means ''I'm a biology major" has been replaced with 'I'm learning human biology to eliminate world hunger.' Stanford was keen to explain that this fundamental shift was not related to career trajectories, but the reasons behind them. They called the new approach 'purpose learning'.

Purpose learning encourages a more personalised approach to learning, shaping the curricula to the needs and preferences of each student.

In Taiwan, the government is taking this so seriously that they've radically altered the country's education system. Audrey Tang, Digital Minister in the Taiwanese Government explains *'We made a new curriculum [that focuses] on the competence of the student as a lifelong learner as well as achieving a common good. Notably lacking is any individual-to-individual competition [and] top-down, standardised answer that only the teacher holds...We emphasise that the children – especially when they are seven or eight years old – are naturally curious beings...asking a lot of very hard questions about the structural issues concerning our environment, our society, and our economy.'* [7]

In other words, Taiwanese children are not taught to give the same answer or even seek the answers to the same questions; they're taught to follow their own interests, set their own projects, and find their own solutions. They're not set up to compete, rather they're encouraged to pool their talents and collaborate for the common good. According to the World Economic Forum, Singapore has gone a step further, with books reportedly no longer showing students' position in the class, allowing pupils to focus on their own progress. The Ministry of Education reportedly wants to reduce excessive focus on grades, encouraging lifelong learning and rethinking soft skills such as creativity and leadership, likely to increase in importance over time. [8]

Collaboration over competition is one of the much-discussed potential strengths of the metaverse too, as it's where people can learn and work together.

As Lindsay Nadin of Pearson says, '*You could do some impactful collaborative problem-solving, working in teams that aren't just the people in your class but people from all over the world, and go on to use these skills when entering the workplace*'.

Every job's a job in tech

One of the problems confronting young people is that when they leave school, they don't have the skills needed to succeed in the world of work. *'The education system is still very much based on remembering facts as opposed to disseminating information to make informed decisions, which is a life skill that is more important than being able to remember what is in a textbook, especially when we have handheld devices or calculators on our phone and things like that'* suggests Nick Richardson, who runs one of the top insights agencies within the kids' media business.

Another is the rise in automation and robotics, and the disappearance of entry level jobs as a result. Take mechanics as an example. Fixing cars now requires plugging in a laptop, meaning traditional mechanics are becoming obsolete. Piers Collins, co-founder of **hundo**, characterises the problem as learners being *'held to ransom to an education system that is old and very slow moving',* pointing out that by the time the government decides a new policy, like encouraging six-year-olds to study STEM, it takes another 12 years before those students enter the workforce, by which time industry has moved on wholesale.

Starting to interface with students twelve-years-old or younger, encouraging them with technology to provide some kinds of reward system will be key. As Esther O'Callaghan, the founder of **hundo** explains, *'the way we live, work, learn and earn is going to be fundamentally different over the next century and pretty much every single job will be underpinned by some level of technical proficiency as a requirement. That will be the case whether you are a waitress using a tablet and inputting data for drinks orders, or whether you are a health care worker who is having to use AI in diagnostic tools to treat patients.'*

Learn to Earn

There's every possibility that in the future, accreditation might rely on using tokens – new types of digital currency, minted and made available by private enterprises such as Meta or Amazon, or even Unilever. If skills-to-jobs matching does not improve, companies may circumvent the education system and create their own training modules in virtual reality, for which they award their own tokens as qualifications and credentials.

The CV may well be replaced by an e-wallet of digital credentials, verified records of skills or competencies, proving one's mastery of them online. As Esther O'Callaghan suggests *'The skills wallet is vocational...there will be a test or a completed course which is then validated. In the same way you would do your British Red Cross first aid training, once*

it's complete you receive a credential. That goes in your skills wallet. You are starting to match skills not references, not using a student's employment history information because it tends to be light in detail and experience. We focus on matching the skills to reduce hiring bias, not the colour of their skin, or their foreign sounding name.'

Dallas Hybrid Prep, which opened at the start of the 2021-2022 school year with a hybrid model of virtual and in-person learning, is one of the first US schools to implement a skills and rewards approach on a digital platform. Students learn from home three times a week in a gamified learning metaverse and twice a week on campus. They're rewarded for things like good attendance with tokens that can be used to upgrade their avatar or provide other game-like rewards. The school plans to allow students to convert those points into a digital currency that they could earn through participating in school. Teachers would be able to track student progress and engagement on the platform, automating grading. Furthermore, the school lets companies connect directly with students for virtual mentoring and internships, which they claim saw students go on to earn $1.7m from tokens.[9]

Virtual Realities

There's no immediate incentive for incumbent universities to teach in the metaverse, as the commercial model depends on charging students to attend in person. Nevertheless, some are still experimenting.

Certainly, metaverse education holds a great deal of potential for those working towards vocational qualifications, mature students, or anyone studying part-time. For these groups, virtual education is ideal because people can come home from work and join their lectures via a headset. Immersive metaverse environments will give them a sense of physical presence and participation, reassuring them that they're not alone.

These virtual environments also grant learners access to processes that would not be available or accessible in the physical world. As Professor Richard Bartle, games designer and author of "Designing Virtual Worlds" suggests *'You could be working with expensive ingredients or materials, perhaps working with gold to make jewelry, or if it's something dangerous, for instance looking at the inside of a nuclear power station to see how it works…VR will be another way to mix it up.'*

Virtual reality may also provide the opportunity to deepen student engagement. In real-world classrooms, eye-gaze is a powerful tool to engage students in the points a teacher is making. By connecting through eye contact, students feel as if they're the sole recipient of a teacher's attention, which in turn, improves learning outcomes.

In VR environments, tracking and rendering data creates everything users see. This allows creators to filter data before they send it, meaning that you see what they want you to see, rather than a realistic representation of what they're doing.

In teaching, this could have transformative effects. Teachers could send filtered versions of themselves to every student in their virtual classroom, connecting with each student through augmented eye gaze. Jeremy Bailenson has carried out experiments in this area, finding that while students usually don't enjoy the experience as much, this approach can increase engagement - and test scores. [10]

Generation Speak

According to Nick Richardson, today's generation are all about talking. Generation X (born 1965-1980) were *Generation Type*, Millennials (born 1981-1996) were *Generations Swipe*, and Generation Z, those currently studying in further education and entering the workforce today, are *Generation Speak*. And they're showing us how changing communication preferences are changing education.

All of today's technology is moving to voice. If Gen Z want to find a local hairdresser, they ask Alexa *'find me a local hairdresser'*. Alexa comes back with a recommendation, rather than a choice. While information is more accessible to them than any generation before, their access to information is reducing, as more decision-making is outsourced the answers become more and more prescriptive.

Much of what people say is recorded now, and sometimes never deleted. The internet never forgets and likely neither will AI. It may well add a further level of anxiety to Generation Speak in terms of their learning. After all, who wants to ask stupid questions? As Nick Richardson reminds us, *'If you say something in the playground fifteen kids or 20 kids might hear it but if you say something online or you react online, 15 billion people see it…you could become a global superstar for all the wrong reasons'*.

That said, online assessment is already here. [11] Right now, schools are beginning to pilot online assessments, typing or swiping rather than handwriting. A new generation of students are sitting at their computers, likely speaking to their devices rather than typing, especially when at home. How can educators and assessors start integrating more technical, skills-based learning into education inside and outside the classroom, using emerging voice technology?

Current Case Studies

Kidzania:
physical learning space

Based in Westfield in Shepherd's Bush, London, **Kidzania** is an interactive, indoor city made for kids aged 4-14-years-olds.[12] From airline pilot to surgeon, firefighter to DJ, kids can work, play, earn and learn while having fun roleplaying a range of activities. There are activities for toddlers up to 3-years -old too, including storytelling, arts and crafts classes and a baby disco. Older kids can explore more complex activities, like working in a bank, a courier company, a fashion studio, a neonatal ward, or even a TV studio. One of the founders, Ger Graus explains *'It's about learning not teaching... supported by adults but not led by adults. It's an environment where you can learn from your mistakes because you may choose something that you don't like. How many instances in modern life is it ok to make a mistake?'*

Kidzania helps children learn outside of school, and helps parents learn about their kids' broader skills and ambitions. In turn, this helps both parents and teachers ready children for the world of work with personalised, individual approaches.

Furthermore, engaging in work-based roleplay activities with people and organisations outside the classroom boosts children's' confidence, whether that's writing to a potential employer or improving their speaking skills. The earlier they start, the more confident they become, as Ger suggests, *'research shows that all stereotypes are set at the age of four...I'm still looking for a good reason why we then wait for another 10 years to talk to them about what they might want to do and allow that stereotype to cement itself.'*
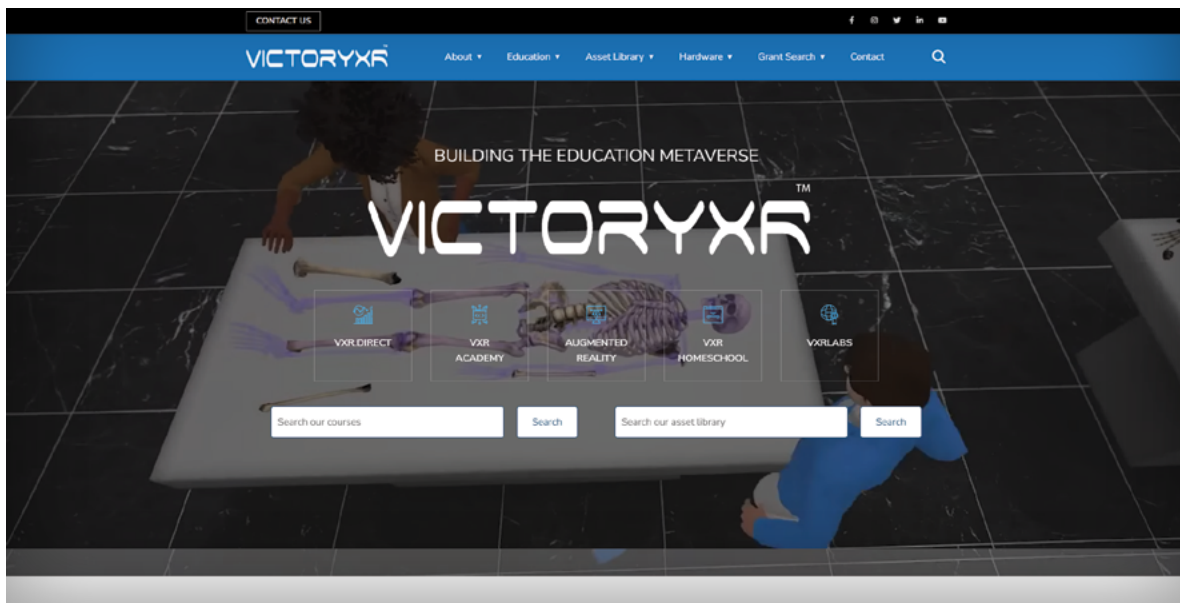
Metaversity model: immersed in virtual reality

If we want to engage young people and students in education, one solution is to provide them with fully immersive experiences in which to learn. Steve Grubbs of **VictoryXR** is one of the most well-known virtual learning champions, building 'metaversity' spaces that provide immersive classroom experiences using virtual reality.[13]

Grubbs has said that technology and affordability aren't typically used in the same sentence when discussing education. But with VictoryXR, students have access to high-quality instructors and interactive lessons, no matter their income or location. Classes are both synchronous and asynchronous, taught live by a professor as well as recorded for students to experience later. Given the nature of virtual reality, students can experience environments beyond their physical borders – learning classrooms can include a starship, a dinosaur island, an art history museum, or even the Galapagos. These can be enjoyed together by students physically located anywhere in the world. The company claims that with trained educators and a wide variety of subjects (over 6,000) student engagement, focus and grades all improve as a result.

In 2021, the company announced a collaboration with **Meta Immersive Learning** to launch digital twin campuses, constructed in fully spatial 3D, at Morehouse College. In this virtual space, students can attend class, learn and move around just like they do in the physical world. VictoryXR can build an entire digital campus including labs, stadia and arenas, and even the exterior metaversity grounds with walkways, trees and other landscape features. The deal has delivered ten additional digital campuses in 2022, on top of the original Morehouse College collaboration.
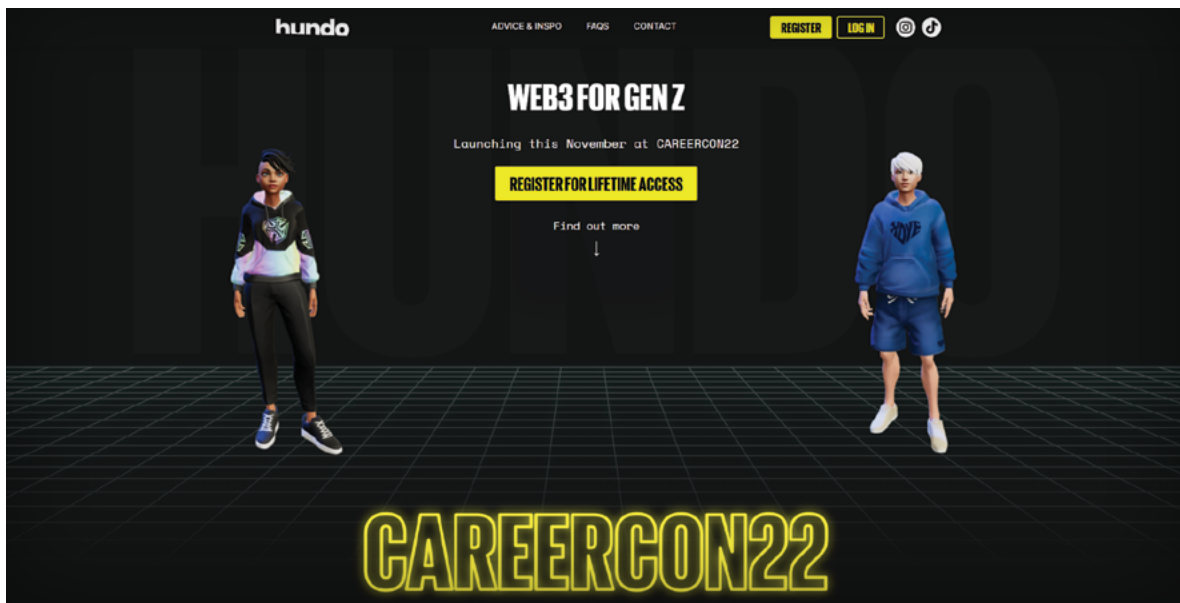
hundo Model:
a learn-to-earn network

hundo positions itself as the home of web3 for Gen Z, where they can earn while they learn. The idea at the heart of hundo is to replace CV qualifications with a digital skills wallet, containing tokens earned by completing masterclasses and courses. These tokens serve as validated and verifiable proof of their achievements. Classes take place over the cloud, connecting students to the right educational content, while recording, capturing and aggregating real-time user data, enabling an ongoing feedback loop. Pre-recorded content is created by learners, staff and partners in their network. Mini lectures of 5-10 mins are delivered in a *'visual, vibrant, virtual and viral'* manner, to ensure an enjoyable educational experience.[14]

hundo has developed a learning network that is facilitated rather than directed, personalised and tailored to the knowledge, skills and experiences of the learners. And those learners are encouraged to be learners for life, as they can access all manner of multimedia – including VR ¬– giving them a sense of presence that can aid recall and application.

hundo.xyz is subscription-based for both individual learners and business enterprises. Learners under the age of 25 will be offered the service for free. In return, they get access to engaging educational content and will be accredited through the tokens known as LetsGo! rewards. Companies and brands get access to a global talent pool of people accredited in the skills and competencies most relevant to 21st Century business, such as GreenTech, SpaceTech, SportsTech and beyond. And students get a wallet full of credentials that serve as qualifications.

Implications for Testing and Assessment

Personalisation

It's becoming increasingly clear that feedback from learners and their learning experience is key to personalising education, delivering relevant content in the most appropriate way. As Nick Richardson stresses, it's important to collect data on an ongoing basis. Of course, that's more possible remotely, where we can use data to identify students' favourite subjects and how their preferences evolve. Nick can tell, for example, that girls are becoming a lot more enthusiastic about gaming over time.

Credentialisation

The ability to tokenise learning experiences, offering tokens as rewards for acquiring skills and achieving goals, is gaining momentum. The question is: will it replace or complement existing accreditation systems? We can see from some of the examples above, more technical skills can be rewarded with credentials, similar to the way Gen Z earn rewards for upskilling in virtual realities or games.

It's possible this generation will move seamlessly from virtual gaming credentials to virtual learning credentials, especially if corporate brands move into this space. The big opportunity for them is to offer branded courses in return for branded credentials that can then serve as a short-cut to a career in their organisation. The lesson here is to start offering credentials alongside paper certificates and seek out partnerships with professional bodies already using digital credentials. The credentials themselves are valuable but it's through them that meta data can also be employed to create entirely new value in the sector.

Datafication

The added value of digital credentials will inevitably go beyond the individual skills data created. Credentials will start signposting the right recruitment opportunities within any given sector. At **City and Guilds**, digital credentials are already used to allow individuals and organisations to communicate and verify skills and achievements online. Patrick Craven, Director of Policy & Strategic Partnerships explains, *'The system could become more tightly aligned. The meta data within a credential has the potential to be used*

to signpost recruitment opportunities within a sector that someone is looking to be employed, either because data is being pushed out into the sector or the recruitment systems for the sector are crawling over digital profiles to find the people who have certain credentials.' Moreover, if a sector required new skills at any time, this approach can notify employees or employers of the need for new skills training, delivering *'a credential system that works for both learners and employers'.*

Over-justification

A tokenised rewards system has potential downsides. If we give people extrinsic rewards (either money or prizes) for things they find intrinsically interesting, they may stop being interested in the thing itself. Richard Bartle calls it bribery, as you're saying: "if you do your homework, I will bribe you." What children often learn from rewards like stars or credits in the school system is that they're short-lived. *'Generally, gamification is about giving people badges, about having leader boards and points so that you can spend on things that you rapidly realise are worthless.'* What may be different in the cases illustrated above is that those points or credits can be turned into something meaningful – awards not just rewards, and credentials not just credits – which may lead to a career.

Realisation

If these innovations are to take off in education, full engagement is needed, as Ger Graus points out *'I hear about the potential of technology, and the metaverse, but I hear nothing about the engagement with adults, with teachers and parents. There seems to be an assumption that it will just happen'.* The potential for these new pathways to qualifications, credentials, skills, and jobs requires a real connection with those who could most benefit –students.

How do we pilot this in a way that's collaborative, itself a learning experiment with a data feedback loop? How do we construct it in collaboration with teachers, students and parents? Nick Richardson summarises the potential by drawing an analogy with the revolution in broadcast media. *'If you were to go back to the nineties the top broadcasters were BBC, ITV, Channel 4, Channel 5, Sky and so on. They were the dominant players. Fast forward to 2022, the term broadcaster needs to be redefined…it's You Tube, Amazon, and Netflix, and maybe gaming, Instagram and Tik Tok too. That is an example of what could happen to education, to the traditional qualifications: NVQs, GNVQs, A-levels, GCSEs, university degrees and so on…why can't the same thing happen to the education market, there's no reason why it can't.'*

Recommendations

1. Seek out support for these innovative areas of learning from regulators and demand clarity on the future of regulation for virtual reality learning environments and their crossover into physical reality. Develop mixed-reality guidance for mixed-reality learning and mixed-reality teaching of the future.

2. Government should aim to set a framework for digital innovation in some of these emerging areas that preserves autonomy to deliver employer-directed solutions. For example, adopt the Digital Identity Trust and Attributes Framework approach for standards in digital skills credentialing.

3. Awarding bodies should aim to fully understand the emerging marketplace of digital wallets, credentials, micro-credentials, employers, and educational offerings that will make up a new, dynamic, and digitised edtech ecosystem. And engage with relevant regulators on the ethical and legal implications of new personal data streams.

4. Ensure that a good balance is struck between technology and teaching. In adopting some of these experiments and initiatives, no one wants to see teachers reduced to the role of trainers. Constant monitoring and measurement of pilots will be critical.

5. Gaming is the gateway to a future mode of learning as we enter a more immersive digital world. Make gaming a core part of the curriculum, in the same way coding started to be spoken of a decade ago.

About the Author

Tracey Follows is a futurist and the founder CEO of Futuremade, the futures consultancy. She is the author of *The Future of You: can your identity survive 21st-century technology?* and host of *The Future of You* podcast, where she invites renowned academics, authors, commentators and innovators to discuss the future of identity in a digital world. Tracey is a member of the Association of Professional Futurists, the World Futures Studies Federation, a fellow of the RSA and an associate fellow of the World Academy of Art & Science.

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