

Developing skills and establishing new pathways into jobs



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ABOUT THIS REPORT

Based on extensive research, this report explores how data-driven, learner-centric, highly scalable solutions can enable post-16 learners to upskill, reskill and find pathways into employment. There is vast untapped potential for technological innovation in this sector. This report gives vital insights into how that potential can be developed, with actionable recommendations for policymakers, employers, educators and founders.



Nic Newman
Partner, Emerge Education

Foreword

Awareness of the power of technology for learning has shifted dramatically in the wake of the Covid-19 pandemic, but the challenge facing us in terms of skills for the future of work has only grown.

There is an opportunity to build on this new awareness of the power of vocational education technology (voctech) and to create significant positive impact – but this will only happen if we fully understand the challenges that underpin a hugely dispersed and uneven vocational system. Evidence clearly shows that overall adult participation in learning is declining, and that access to and engagement with learning is not evenly distributed – the more learning you have, the more likely you are to have access to further opportunities.

This green paper reflects significant consultation and research, looking at the way the system currently functions, the challenges and needs of many disparate learners, and the pressures and challenges facing employers and learning providers. What came through clearly in all of the engagements was the need to think about why we learn, why we want people to learn and the impact that good use of tech can have (and the dangers when tech implementation is poorly thought through).

At Ufi VocTech Trust, an organisation dedicated to better use of technology for adult vocational learning, we are focused on the ‘unloved’. Those learners, sectors, skills levels and geographies that get less attention and less focus from both a political and commercial perspective. In many ways you could argue that most of the UK vocational sector is unloved – we believe that a focus on technology designed specifically to address the needs and challenges of the adult vocational sector will bring benefits for individuals, employers, educators and society as whole.

If we are seeking to use tech to truly impact adult vocational skills from the perspective of increased opportunity, equity and parity, then we must start from the point of the learner. This means new ways of looking at education pathways, moving away from the course-led focus, and a focus on the reasons why people learn new skills – and it means looking at ways tech can support personalisation and increase the scale of access and opportunity.

This paper presents some interesting challenges both to the sector and to policymakers – and some suggestions as to the solutions. We have an unprecedented opportunity to do something great – let’s rise to the challenge together.



Rebecca Garrod-Waters
Chief executive officer, Ufi VocTech Trust

Foreword

The job landscape is more complex than ever. There are talent marketplaces, apprenticeships, the gig economy, side hustles, a profusion of new ways to earn online and – as discussed in depth in this paper – some fascinating new pathways into jobs, such as industry certification platforms, bootcamps, staffing companies and employer-funded learning.

On the one hand, this brings many opportunities that didn't exist before. On the other hand, it's bewildering and we see that all stakeholders – employers, policymakers, educational organisations and founders – are struggling to make sense of it.

But make sense of it we must: the world faces a massive skills gap. The pandemic has seen this gap grow, as the world changed so much and now requires different skill sets and expertise.

One friend we have through all this is data. We have data on people, data about learning content, data about skills, data about the consumption of learning, data about qualifications and much more. The problem is that it lies in disparate areas and our collective ability to synthesise this information is still nascent.

I encourage all interested parties to step into this important challenge and use data as a guiding light. It will be difficult at first but by starting small, specific and close to your own areas of expertise, we can develop useful insights that can be shared with others and lead to further illumination.

We have done this at Filtered. By looking at raw data about learning content we have built a technology and methodology to decipher the natural language of learning content into skills taxonomies. That work can now be joined up with job role data to make the connection from human being to learning content via skills, across companies, at scale. This just wasn't possible five years ago. It is one example of what good data-oriented collaboration can bring.

It strikes me that in education we are a little behind when it comes to data and technology, compared to industries such as media, entertainment and marketing. I suspect that it's partly our fault – we have not readily embraced new technologies as quickly as we might. It's also because of the inherently long feedback loops in education. The step from learning activity to demonstrated skill development is rarely clear and direct.

So the problem is difficult but the prize is huge.



Marc Zao-Sanders
CEO, Filtered

Introduction

The Covid-19 pandemic has severely dented the career prospects of young people and adults, and threatens to have a prolonged negative economic impact. It may be harder for young people to take their first step onto the career ladder, and for adults to reskill and move sectors, while reduced job opportunities will make it harder for both to upskill and move into higher-paying occupations.

Covid-19 has also accelerated the impact of a range of long standing skills and employment challenges, from the threat of automation and other changes to the nature of work posed by the fourth industrial revolution, to the [demographic shifts](#) attendant upon an ageing population. [McKinsey](#) reported in early 2020 that 87% of companies globally are either currently facing skills gaps or expect gaps to emerge in the next five years. In the UK, sectors such as adult social care, hospitality and construction are already experiencing further recruitment pressures as a result of the new skills-based immigration system introduced from January 2021 and the end of European freedom of movement

Upskilling and reskilling will be crucial to meeting these challenges, by creating learning pathways for young people and adults to acquire in-demand skills and move into well-paid, sustainable roles. Traditionally, higher education has been viewed as the primary route to secure a meaningful career. But more than 100 million low-wage workers globally [may need to find new jobs](#) in the next decade. Even if all university students go on to secure meaningful careers upon graduation, this still leaves one hundred million of post-16 learners underserved by existing education providers, who are often not set up to address the specific needs of these learners.

Since the Wolf review in 2011, technical and vocational education has been thrust further into the mainstream. The

last few years have seen a focus on apprenticeships and T-levels, launched in November 2020. The January 2021's '[Skills for Jobs](#)' white paper focused on the role of employers in skills development, and noted the importance of flexibility within the sector but with little in terms of future planning or funding.

Overall, adult participation in learning is falling, and it is not distributed evenly across society. The poorest adults with the lowest qualifications are the least likely to access training, despite being most in need. The result, according to [analysis from the Brookings Institute](#), is that less than 60% of workers escape low-wage, low-skill clusters over the course of 10 years, and the odds decrease thereafter.

This landscape calls out for a new generation of alternative education pathways that enable individuals to develop their skills and secure their first job, or transition into a new career from their existing job. There is vast untapped potential here. But to make the most of this potential, we believe future pathways into jobs must meet three requirements to deliver the best outcomes for individuals. They must be:

- **data-driven**, accurately identifying skills gaps, and increasing the reach and impact of high-quality education delivery
- **learner-centric**, creating flexible, personalised training designed specifically for adults
- **highly scalable**, which means harnessing the power of technology to reach larger numbers of learners than traditional brick and mortar education providers.

Through market research and interviews, we have identified four specific models for developing skills and future pathways

to jobs that can be scaled rapidly and effectively thanks to emerging trends in the use of technology.

Our goal is to demonstrate how **data-driven, learner-centric, highly scalable** solutions can enable post-16 learners to upskill, reskill and find pathways into employment. We also consider what needs to change for this to happen.

In the first part of this report, we look at the current skills and employment landscape, examining the emerging trends and opportunities that will shape a data-led skills recovery. Alongside this, we consider recent changes in the post-16 learning and training ecosystem. We evaluate the key challenges facing adult learners in order to define a vision for data-driven, learner-centric and highly scalable technology-enabled learning as the best way to meet the skills and employment demands of the next decade – and unlock the potential of millions of post-16 learners worldwide.

In the next part of the report, we look more closely at four emerging models: industry certification platforms, bootcamps, staffing companies and employer-funded learning. To illustrate the different approaches, and their optimal suitability for different types of post-16 learners, we offer case studies which highlight first-hand insights, examples of best practice, and specific opportunities for education organisations, employers, training providers and technology startups to work together.

In the final part we will discuss some implications for policymakers and seek to drive adoption from employers and educators by asking, how do we move from here to there? What are the key gaps and barriers that need to be overcome.

How can universities and FE colleges identify their key capabilities and

strategies to pursue? How can employers identify their skills gaps and build a pipeline of high-quality talent? And how can edtech startups tailor effective solutions and maximise their impact?

KEY TERMS

Skills development: This term is gradually replacing ‘technical and vocational education and training’ (TVET), and indicates a shift in emphasis away from supply-led systems which dictate the mode of learning and the pathways to be followed. Instead, it places emphasis on the acquisition of skills in demand in the workplace, regardless of where, when or how they are acquired.

Future pathways: We define ‘future pathways’ as solutions that take an untrained individual and provide them with the skills and support to secure a well-paid job in a high-growth industry. In this green paper we are focusing on skills development, but this aspect of upskilling sits alongside [career navigation tools](#), [onramps](#) and job placement – these are also exciting, in-demand categories with lots of emerging opportunities.

Vocational learning: Vocational skills are often defined as occupational and technical skills that individuals acquire, usually, from hands-on experience. Because employers routinely report that employability and workplace readiness skills are as important and in-demand as vocational/technical skills, we are deliberately using the broader term “skills development” in this report.

Employability skills: These are skills necessary for getting, keeping and being successful in a job – such as teamwork, problem solving, organising etc. They build on core [basic skills](#) such as communication, numeracy, literacy and digital skills.

01

**The growing importance
of alternative pathways
into jobs**

THE GLOBAL
SKILLS GAP IS
ESTIMATED TO REACH
\$8.5tr BY 2030

Skills and employment landscape

The global skills gap is estimated to reach \$8.5tr by 2030, with 85m unfilled vacancies worldwide.

This is the result of several trends:

- The gathering pace of the **fourth industrial revolution**, especially the impact of automation, which is not only displacing jobs but also baking a lack of skills into many entry-level roles.
- **Sectoral trends** such as the long-term decline of high street retail, coupled with a rise in sectors without a strong tradition of training and skills development, such as hospitality, leisure, warehousing and logistics.
- The **green agenda**, where initiatives such as the ‘Green Jobs Taskforce’, which will “focus on the immediate and longer-term challenges of delivering skilled workers for the UK’s transition to net zero”, are vital to ensure that individuals can access the new job opportunities associated with a net-zero economy, and achieve a just transition for those currently working in emitting sectors.

Alongside the scale of unfilled vacancies associated with these skills shortages, McKinsey estimates that by 2030 more than 100m workers in

developed economies will need to switch occupations. The majority of this growth in labour demand is expected to occur in high-income jobs, especially technology. (Microsoft predicts that there will be 149m new jobs in technology alone by 2025.) But all roles will, to some extent, involve proficiency in digital skills, which means these shifts will reach into sectors we might not initially assume to be tech-adjacent. The majority of workers affected are in low-income brackets, and roughly half of them will need more advanced skills in order to move to a new, sustainable occupation.

Upskilling and reskilling on this scale represents an enormous challenge, not least because global economies are already struggling to overcome a severe skills mismatch. In the UK there has been a general decline in training participation since the early 2000s, though lower skilled workers have consistently received less training.

Now, according to the OECD Skills for Jobs database, more than a quarter of the UK workforce are underqualified for their occupations, among the highest of the countries analysed. While shortages in STEM are often cited, there are critical shortages across a range of skills, knowledge and capabilities, with particular issues around workplace

readiness and mid-level technical skills. Employers reported that almost one in four vacancies in the year 2019/20 were hard to fill specifically due to skills shortages, especially for roles such as computer programming but also in nursing and HR.

KEY TERMS

Skills gaps: This describes the difference between an individual's existing skill set and the skills that the industry needs them to have to effectively perform their job roles, which can be filled by further training of the existing workforce.

Skills shortages: These are deficiencies in the external labour market which exist when employers are unable to fill, or have considerable difficulty in filling, vacancies. Overcoming a skills shortage requires the recruitment of more people into an industry.

Skills mismatch: a lack of alignment between workers' skills and those required by employers. A skills mismatch can reflect both skill shortage and skill surplus.

The impact of Covid-19

The long-term trends outlined above have been accelerated and exacerbated by the Covid-19 pandemic, which has also revealed their disproportionate impact across society.

The negative financial impact on global economies

The pandemic drove global unemployment to record levels. The International Labour Organisation (ILO) estimates that 114 million jobs were lost globally in 2020, and lasting damage to the labour market is expected – the ILO warns that the pace of job creation is unlikely to make up for lost employment until 2023. Indeed, the full scale of the pandemic's impact is yet to become clear. The World Economic Forum warns of further spikes in unemployment as the drawn-out nature of the crisis forces more companies to restructure or close.

The impact of this damage will be disproportionate as 80% of workers facing job insecurity do not have a university degree. As for those with degrees, recent graduates have been hardest hit, with unemployment rates almost three times higher than the average for all graduates.

Young people have suffered worst overall from unemployment and loss of income – 70% of employee job losses between March 2020 and May 2021 were among under 25s, driven in part by the fact that they are more likely to work in sectors that were shut down, such as hospitality, retail and leisure. We know from previous recessions that this leads to significant scarring effects over time, in terms of both pay and career progression. Older workers pre-retirement have also been adversely affected. The Centre for Ageing Better's analysis of ONS data finds that only around one third of workers aged 50+ are typically re-employed after a redundancy in the UK.

Given this context of rising unemployment, many of those who will need training might not be in employment, or in employment with on-the-job training opportunities.

The exposure of digital skills gaps and the digital divide

Covid-19 induced a digitisation jump estimated to be equivalent to five years, which has brought into sharp focus several pre-existing but previously unnoticed shortages. A deficit of digital skills, from basic to advanced, was experienced across occupations and sectors as employers moved to remote working, learners to online learning, and services to online distribution channels. Tech-related occupations also experienced shortages, chiefly linked to developing and delivering online training materials for trainers, students and parents, and in networking and cybersecurity. According to the Covid Recovery Commission's report on 'Building Back Together', around five million workers in the UK will lack basic digital skills by 2030.

The opportunity to retrain those who have become furloughed or unemployed

Skills development has an important role to play in the immediate response to this economic crisis – in getting people back to work and helping workers to find new jobs in growing sectors, but also in building resilience and implementing longer-term recovery strategies.

“At the outset of the pandemic, there were an awful lot of people either furloughed or laid off in the hospitality and catering sector. They had 90% of the skill set that you needed to work in logistics and retail, which had loads of jobs. But they didn't have the modular, accredited qualification that they could take at that time to rapidly reskill and prove those skills to employers. And because the world of work is changing so dramatically, there is a need to be able to transfer and change. The difficulty is you may end up almost having a bigger divide between the 'haves' and the 'have nots': the ones who are in work are better off because they've got somebody who can validate that they've done this, whereas the ones who've been out of work haven't got that validation, so they get disadvantaged.”

Paul McKean, director of FE and skills, Jisc

Yet along with its adverse effects on labour markets, the Covid-19 pandemic has disrupted education and training at all levels. Technical and vocational programmes have been particularly hard hit, given their focus on work-based learning and the acquisition of practical skills. While the wider focus has been on lost learning during the pandemic in schools and universities, adult participation was also affected – the emergency pivot to remote learning, alongside disruptions to assessment, led to some demotivation among adult learners, who typically have to balance learning with caring responsibilities.

The effects of this are again being felt disproportionately. Just one in five adults who left school at the first opportunity took part in some kind of formal or informal lockdown learning, compared to three in five adults who stayed in education until 21. One third (34%) of adults who were out of work took part in lockdown learning, compared to more than half (52%) of those who were in employment.

The UK government's furlough scheme could be considered a missed opportunity to retrain those in at-risk roles and industries, although some provision was made through

providers such as global online learning platform Coursera, which provides access to online learning to upskill and reskill unemployed workers who have been particularly disadvantaged by the pandemic through its [Workforce Recovery Initiative](#).

The need to reshape employment training, upskilling and reskilling for a future of remote working

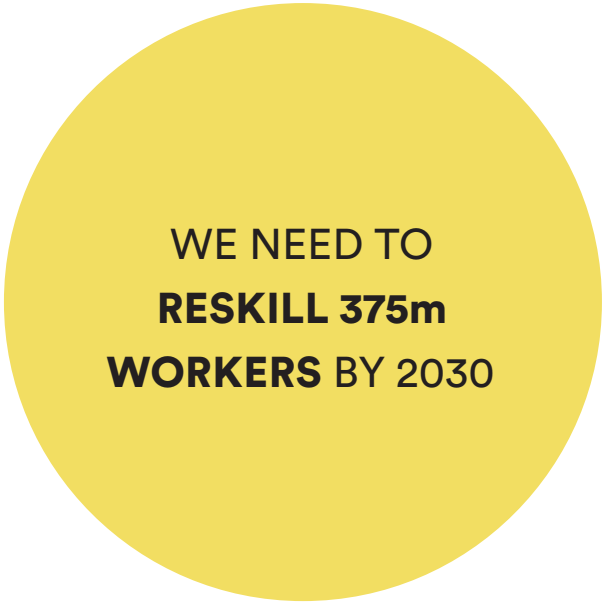
The pandemic has not only disrupted learning but also brought to the surface problems with online learning provision that predated the current crisis, such as a lack of technological infrastructure and digital connectivity, skill gaps in online teaching and learning, the shortage of digital skills, unequal access to education and training among students and workers, the lack of digital pedagogical resources, and financial constraints. The UK Industrial Strategy Council has identified that a lack of basic digital skills is the [main contributor to skills mismatch](#) in the UK.

Skills development and training ecosystem

The labour market uncertainty precipitated by Covid-19 has resulted in a sharp uptick in post-16 learners choosing to enter or stay in full-time education. In 2021, almost half of UK school leavers applied for a university place and there has also been a rise in applications for non-vocational postgraduate degrees, as graduates seek to defer entry to a challenging employment environment.

However, the current higher education system is not set up to equip learners at scale with the skills required to access the most sustainable or in-demand jobs. Although universities are typically seen as the best route to start a meaningful career, there is a large and widening gap between higher education and industry. The narrative that “university is for all” risks entrenching silos between academic and technical routes that lock learners into separate tracks, and establishing a de facto hierarchy that pits HE against FE and other forms of post-16 training. Analysis by the Institute for Fiscal Studies shows that FE and sixth form colleges in England have seen the largest falls in student funding of any education sector since 2010.

There is no one-size-fits-all model. The technical and vocational education and training ecosystem is large and fragmented. There are currently more than 15,000 qualifications on Ofqual’s Register of Regulated Qualifications, offered by 242 different awarding organisations. Individuals aiming for a career in plumbing, for example, have to choose between 61 qualifications. Faced with such a bewildering array of options – and even more credentials and badges available online – plus limited transparency on outcomes, learners often make inefficient decisions when choosing training, relying on skills self-assessment estimates or on careers guidance in schools that is skewed towards HE. Learners can also be too focused on content and subject matter, and are not alert to other aspects valued by employers, such as soft skills, leadership and workplace readiness.



**WE NEED TO
RESKILL 375m
WORKERS BY 2030**

It is not a question of either/or. We need to reskill 375m workers by 2030. Even if all university courses offer excellent job outcomes, universities alone will not be able to reach the scale required to bridge the growing skills shortages.

“One of the challenges is changing the perception of vocational learning, because we need to not see it as a poor relation to universities. And I think it’s important for universities to be more employment-focused, without turning into training facilities, and build in meaningful experience outside the classroom. We need to prepare students so that when they graduate, they are genuinely independent learners who have an awareness of what they need to learn, because they’re not going to be with the same employer for 50 years. They’re going to have to go from employer to employer, from job to job, and they will need to have much more awareness of the skills that they have, and what skills they need, to be able to make that jump.”

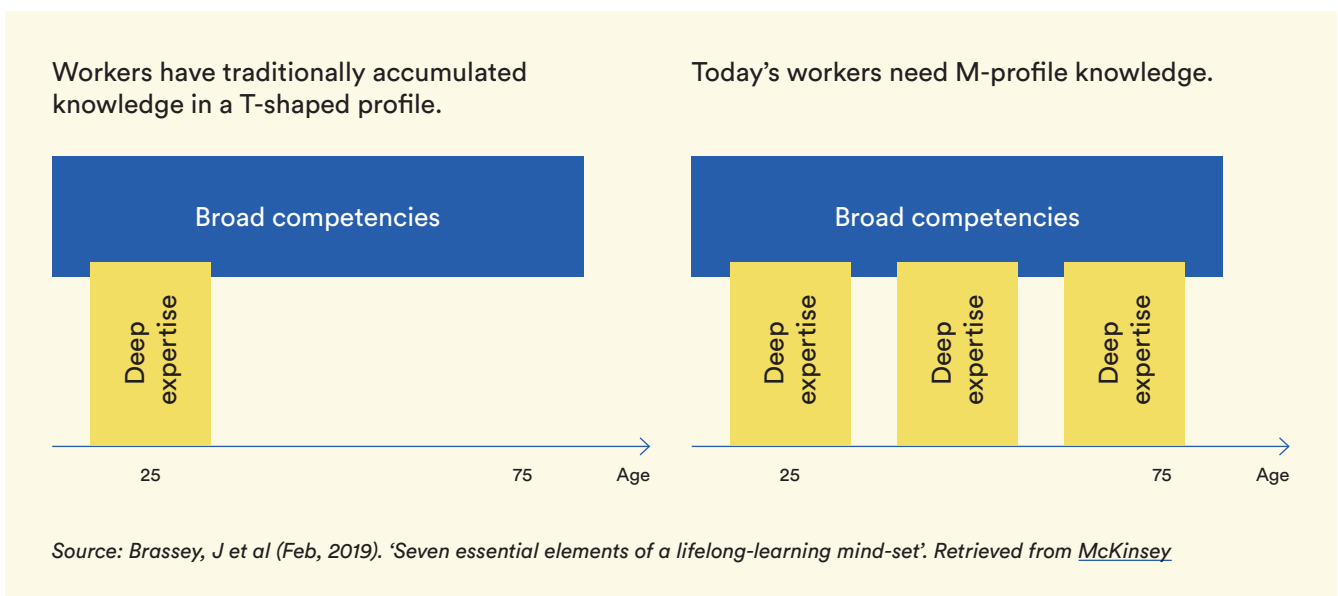
Douglas Howat, dean of undergraduate studies, Coventry University

Crucial shift: from ‘course-led’ to ‘learner-centric’

A ‘course-led’ rhetoric dominates the language of post-16 training and skills development. As skills taxonomies proliferate, the focus – from higher education all the way through to workforce development – is on the supply of courses to meet these perceived needs.

Although skills shortages and skills gaps must inform skilling and training provision, they should not drive the way that skills are shaped. The transformative changes of the next 10 years mean that training around specific technical or vocational skills risks training people into siloes. What employers seek is the ability to learn and apply new skills, to flex and change.

To stay relevant in this complex, rapidly evolving landscape, learning and training providers have had to change the way they think about upskilling. Previously, the ideal was to train employees with a ‘T-shaped’ profile, signalling deep expertise in one knowledge area combined with broad skills and the ability to collaborate across multiple disciplines. Workers tended to develop deep expertise early in their career and then supplement this knowledge over the years with on-the-job development of integrative competencies. Upskilling and reskilling, with a goal towards sustained employment, requires a departure from this T-shaped, singular expertise profile towards a more flexible ‘M-shaped’ profile, where people reskill two to three times over the course of their career. As up-to-date and in-demand skills in fast-changing fields become the new currency, post-16 learners must expand their expertise in multiple areas with additional training.



To be ‘learner-centric’, then, means emphasising the relationship between skill sets, expertise and roles according to an adult learner’s individual needs and circumstances. This centres holistic skills that pave the way for a career, before specialising knowledge to specific roles or employers. In practise, this affects:

- Course design
- Technology design
- Operational delivery

“There are so many jobs that aren’t even created yet, that will be. So what jobs are out there now, where are the job growth areas, and where not to send people if that job is going to be taken over by technology within the next 5-10 years – that kind of overall awareness is critical for careers practitioners. It’s also preparing people to have skill sets that they will need to enable or support that development, such as flexibility, that awareness that a job isn’t for life. So from our perspective, the end goal is to take people pre-employment, both from education and those that are not engaged, and nurture the talent, whether it be T-levels, traineeships, apprenticeships, work experience internships, degree apprenticeships – any pathway, depending on the individual and their needs and the environment that suits them.”

Hannah Kirkbride, founder and CEO, Career Matters

Assessment and accreditation mechanisms will also need to be flexible to the needs of diverse groups of learners.

It is unusual for employers to rely purely on qualifications during the recruitment process, but there is nevertheless widespread recognition that microcredentials, industry certifications and other non-degree credentials are vital to the upskilling and reskilling agenda.

Qualifications for adults will increasingly follow a pattern of modularisation to be integrated within a system of credit accumulation, which can recognise and stack prior experience and prior learning, even where full courses (such as degrees or apprenticeships) are not completed. Currently, this model is easier for training providers and universities to implement than FE colleges, because of the relative flexibility of their respective funding mechanisms, but a future involving modular, stackable units of learning will allow greater use of technology and innovative learning platforms as additional learning resources.

Portability will be vital, so that learners can own their own learning and transact on the basis of their qualifications.

“The university system is built around rigorous validation processes, mapping, etc, and quite a clearly defined product, in the sense of degree programmes. Now, microcredentials may enable a very different approach. Why couldn’t I teach strategy to somebody who does the learning with us, but disconnects the learning from the qualification and then decides, ‘well, I’m actually going to take the Harvard exam rather than the Northampton exam?’ This sort of ‘disaggregation’ might be coming and that would completely change education in quite disruptive ways.”

Adrian Pryce, associate professor, strategy and international business, University of Northampton

This learner-centric approach emphasises flexibility, agility and seamless interaction of resources and platforms. What is important is how the skills development and training ecosystem flexes to the needs of learners, employers and government – and how different platforms communicate with each other.

Technology-enabled solutions will be key to bridging the skills gap.

Given the scale and complexity of the problem, in-person solutions alone will not be able to deliver the mass upskilling and reskilling required on a global scale. We believe that in addition to technology platforms, tech startups will play a fundamental role in bridging the skills gap for employers and addressing the needs of these individuals. For learners, technology is necessary to access flexible, personalised learning opportunities that can be completed at any time and from anywhere in the world. For employers, digital skills are a fundamental prerequisite.

The key takeaway is that data-driven, learner-centric and highly scalable technology-enabled solutions for skills development is the option with the greatest reach and impact to create future pathways into jobs for post-16 learners.

“Digital is very much an opportunity and an enabler. Quite often, we talk about automation as displacement. It shouldn’t be displacing jobs – it should be creating different jobs.”

Paul McKean, director of FE and skills, Jisc

Skills development and training ecosystem

Large numbers of students and workers have been left underserved by traditional education providers. The following groups of post-16 learners are those who have been underserved thus far that we expect to be most affected by the opportunities technology-enabled models afford:

1

Non-degree holders in low-income jobs

These individuals are most at risk of job displacement, and have the greatest need for skills development to access new higher-paying jobs in fast-growing industries. Existing solutions present a lack of affordability and flexibility as most programmes require substantial upfront fees, along with an extended period of full-time commitment.

2

Recent graduates who are unemployed or underemployed

More than one third of recent UK graduates are estimated to be working in a non-graduate role, and another 12% are unemployed. This group requires additional support, guidance and/or skills development to secure their first job at graduate level or equivalent.

3

Aspiring career changers in medium- and high-income jobs

This group comprises predominantly degree-holders working in industries such as finance and professional services, who are seeking to move into a career in tech. Current offerings fail to meet this group’s needs as they have limited alignment with employer requirements and offer little-to-no hands-on experience for practical skills development.

4

16-21 year-olds seeking faster and cheaper routes to employment

Undergraduate degrees are a lengthy and expensive route into employment, typically requiring three years of full-time commitment and an average student debt of £40k. For students who would prefer to save time and money while getting an earlier start to their career, the traditional undergraduate route falls short of meeting these requirements.

In addition to the segmentations discussed above, there are several other post-16 learner populations and factors to consider:

Jobseekers

Here it is important to distinguish between the needs of those recently unemployed, perhaps looking to swiftly upskill in order to move to a role similar or adjacent to their prior experience, and those who are long-term unemployed, who may struggle as much with confidence and workplace behaviours as skills deficits. Learning for jobseekers is typically either self-funded or funded by government.

‘Hard to reach’ learners


In general terms, those learners who do not self-refer or readily seek to engage in adult learning programmes or courses, and are therefore currently underserved by existing learning and training opportunities.

Geographical location

Isolation leads to chronic underinvestment and graduate brain drain. There is a delicate balance to be struck between training individuals according to regional skills needs and preparing them to be competitive in a global economy.

“What can make accessing vocational learning easier for those who need it is a flexible and modular approach to learning. Adults don’t necessarily need a full qualification. You might actually just need a bit of a qualification to get you on to the next step. There are other things that adults are dealing with – full time work, caring responsibilities – so it’s tough to fit in learning and to ensure that they maintain their engagement in learning. We don’t want them to drop out, we want them to engage and to complete so that they can then progress on to whatever they want to do next. So it has to be much more built around the learner, not built around the provider.”

Marguerite Hogg, policy development advisor, Association of Colleges



**ISOLATION LEADS
TO CHRONIC
UNDERINVESTMENT
AND GRADUATE
BRAIN DRAIN**

The data landscape

The nature of work is changing fast. McKinsey estimates that the majority of jobs that will emerge by 2030 in Europe don't yet exist. How can data help prepare for this uncertain future?

There is a pressing need to find ways for high-quality data analytics to assist learners, educational organisations and policymakers in effective decision-making. This is especially important to facilitate decisions about where to invest in lifelong learning, given the scale of possibilities and the need to prioritise high-quality content creation.

DECISION AREAS	EXISTING DATA SOURCES	GAPS AND BARRIERS
Skills gaps	<p><u>Emsi live labour market data</u>, aggregating in-demand jobs and skills.</p> <p>The Gatsby Foundation has <u>mapped the UK's higher technical landscape</u> for employers.</p>	<ol style="list-style-type: none"> 1. Organisations struggle to understand what levels of skills are required for existing roles, beyond job descriptions. 2. Reconciling existing skills taxonomies to resolve barriers caused by synonyms (“collaboration”, “teamwork”, “works well with others”, etc). 3. Employees are often the first to experience when new skills are required. Can data be collected from the bottom up, rather than defined by the organisation from top down?
Future skills needs	<p>Nesta <u>“career causeways” mapping</u>, tracing skills similarities between roles.</p> <p><u>Coursera skills reports</u> map future skills needs and highlight career pathways for learners who earn various recognised industry credentials.</p>	<ol style="list-style-type: none"> 1. Insights into the skills requirements for future jobs. 2. Ensure that the data learners can provide about their competencies align with data that businesses are already using to assess their own workforce and new hires.
Curriculum design	<p><u>Emsi's data to help HE</u> to create and maintain relevant programmes.</p> <p><u>70/20/10 in-work learning model</u> to provide pedagogic underpinning for training, skilling and stretch projects.</p>	<ol style="list-style-type: none"> 1. Many education organisations lack up-to-date industry insights 2. Pedagogy for blended and digital modalities.

<p>Accreditation</p>	<p>FutureLearn’s <u>common microcredential framework</u></p> <p>National Skills Coalition <u>criteria for quality non-degree credentials</u></p>	<ol style="list-style-type: none"> 1. The university system is built around validation processes, including mapping to a clearly defined product (degrees). What is the pathway vision for microcredentials? 2. How can microcredentials build as they stack? 20 credits at Level 3 might need to be very different to Level 7. 3. Is it possible to disaggregate teaching from assessment, so that learners study standardised content in one place and gain a qualification from another?
<p>Measure impact of learning</p>	<p>AstrumU analyse millions of verified data points from students and employers to help institutions measure the value created for learners.</p>	<ol style="list-style-type: none"> 1. Do learning outcomes capture enough data on learner progress? 2. Data can support in the learner journey, but this requires good quality information about adult learners’ needs, drives and incentives. 3. Fragmentation of data landscape doesn’t enable tracking of learner progress across different realms. How might data identify a cause and effect between learning interventions and jobs (hiring / promotion / additional responsibility)? 4. SMEs in particular struggle to evaluate the relative value of different learning options, and find measuring prior experience a challenge. 5. Where employers are feeding into curricula based on skill shortages, helping them understand their impact would facilitate more buy in and engagement.

“Most companies have zero clue what skills they have within their organisation today, other than job descriptions and CVs, but this is vital to understand what levels of skills are required for certain jobs. Now, that’s often defined from top down, but we’re starting to push a lot of data from the bottom up. The reason why that collaboration is important is because a lot of employees are the first ones to experience when new skills are required. The environment changes; all of a sudden, you need to figure out new stuff. So you improvise and you start to learn from new articles, new unstructured content out there that is not instructor led, and you piece your learning together, and before you know it, you’re building a new skill set that now needs to be redefined. That is what gives you a perspective into what skill sets might be needed in the future.”

Dan Tesnjak, vice-president, EMEA, Degreed

Benefits of building a data-led skills recovery

Predicting skills trends in a rapidly changing economy will be a vital part of the UK's attempt to 'build back better' from Covid-19, but it will not only be a one-off response to the current situation. A response informed by data analysis will help us understand trends, skill needs and gaps, but also point the way to suitable training and learning solutions that have the following advantages.

For learners:

- Confidence that they are learning in-demand, industry-aligned skills that employers really need.
- Learning that leads to reliable job outcomes.
- Sustainable, well-paid and fulfilling work.

For employers:

- Candidates with the skills they need to boost productivity.
- Focusing on skills, not qualifications, allows companies to hire from a wider, more diverse pool of people.
- It is cheaper to hire, train and upskill as part of a long term plan for creating mid-level and senior talent than to compete in an ever-smaller pool as a short term fix for hiring gaps.
- Investing in employees early and throughout their careers makes them more likely to stay.

For society:

- Widening opportunities for post-16 learners, especially those most underserved by traditional education. To the extent that job losses during recessions create longer term scarring, these patterns are likely to exacerbate pre-existing inequalities and damage social mobility.
- It is estimated the UK could boost productivity up to 5% by reducing the digital skills gap. According to the [World Economic Forum](#), closing the skills gap could boost global GDP by \$11.5 trillion.
- Contribute to the accomplishment of Sustainable Development Goals (SDGs), in particular Goal 8: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all".

These benefits and more will be explored in our emerging best practice case studies in Part 2, but the possibilities of a data-driven recovery can contribute to a fuller understanding of the current challenges and prepare for a post-coronavirus recovery that will be fair, digital and sustainable.

02

Overview of the emerging models of alternative pathways into jobs

There are four technology-enabled models emerging to provide post-16 learners with the skills and support to secure a well-paid job in a high-growth industry. In this section, we will outline each model alongside case studies providing impactful, real-life examples and key learnings. Crucially, all of these models use data-driven insights and personalised learning experiences to scale their reach and impact, opening pathways to jobs for groups of post-16 learners who have traditionally struggled to access higher education.

Overview of the emerging models

1 Industry certification platforms

These providers offer online self-directed learning and access to industry-approved certifications that are valued by employers. Programmes are paid for by the learner and pricing varies from £20-200 per month. This model offers significant flexibility for the learner, but the focus on self-study typically works for a minority of highly motivated learners, those with pre-existing knowledge and/or those with a strong ability to learn on their own, leading to lower completion rates. There are now several large players in this space, including Coursera and FutureLearn.

- + **More cost-effective** than bootcamp
- + **Industry certifications** are seen as valuable by employers
- + **Flexibility** attractive for those in employment
- **Self-study doesn't work for everyone**
- **Lack of application of learning and feedback** from practitioners can lead to less successful learning outcomes

2 Bootcamps

Bootcamps are immersive three to six-month cohort-based learning experiences that include career support. Each programme costs £8-20k and is paid for by the student through upfront payments, instalments, and/or an Income Share Agreement linked to future earnings. Bootcamps are more industry-aligned than most postgraduate programmes, and are designed to help learners with no prior knowledge become employable at a junior level. However, it's difficult for learners to differentiate between the >400 bootcamps available, and skills development can be limited given the relatively short duration. Unless there is a strong link between bootcamp provider and employers, it's hard to know whether a given bootcamp will act as a strong signal in the job market. The largest bootcamp providers are General Assembly, Flatiron School and Springboard.

- + **More cost-effective** and **functional** than a postgraduate programme
- + Cohort-based live learning provides **accountability/motivation**
- + Repayment options make bootcamps **accessible**
- Bootcamps are **hard to differentiate**
- Learning is **relatively short** and potentially surface level
- With **no job guarantee**, learners risk being left with **debt**

3

Staffing companies

These providers hire and train graduates before deploying them to work at client organisations on a project-basis. Individuals are employed from day one, and staffed at a fee of around £300 per day. For learners, this model is free, with the staffing company providing industry-aligned training and taking 100% of the risk. Learners have a guaranteed job waiting for them at the end of the training process. However, these learners are locked in for a period of at least 18-24 months with the employer, and a significant proportion of salary is effectively shared with the staffing company. There are a number of established players in this space, including FDM, Mthree and Revature.

- + **Free to learner**, with staffing company taking 100% of the risk
- + **Guaranteed job** on completion of training programme
- + Cohort-based live learning provides **accountability/motivation**
- + Immersive learning that is highly **aligned with employer needs**
- Outsourcing hiring can lead to **limited culture fit** between learner and employer
- Learners are **locked in** for a minimum of two years

4

Employer-funded learning

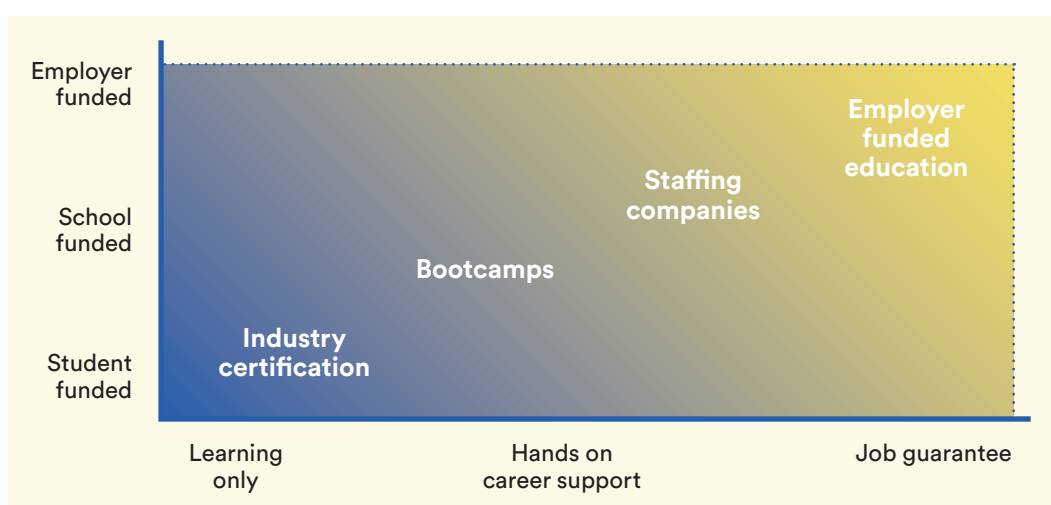
This is a two-year ‘earn and learn’ model where learners split their time 80:20 between work and training. The employer hires the learner and pays their salary, which means learners don’t pay anything for a high-quality learning experience that comes with practical skill applications and a guaranteed job. The employer also pays £10-30k per learner to the provider, and can often access government funding. The most common approach in this category is apprenticeships. In recent decades, apprenticeships saw a drop in demand as higher education became more popular, but a new model of apprenticeships – sometimes referred to as “new collar”, focused on professional services, digital and technology – have emerged to address this gap. Many companies run their own apprenticeship programmes in-house, such as Twilio and Accenture. The UK government incentivises employers to fund apprenticeships in partnership with registered providers, but this has seen relatively low take-up by UK employers who have lost more than £2bn in unspent apprenticeship levy funds over the past two years alone. There are a number of emerging players including government-funding dependent models such as Multiverse apprenticeships, and employer-funded academies such as Patika.dev and Academy.

- + **Free to learner**, with employer taking up to 100% of the risk
- + **Guaranteed job** on completion of training programme
- + **Greater degree of choice** of employer means better culture fit
- + Possible fit with **government funding schemes**
- Requires **educating employers** about the benefits of training on the job
- **Government funding** comes with working capital challenges and outdated training standards

How do these models compare?

A useful way to compare these four technology-enabled models for developing skills and alternative access pathways to jobs is to consider two questions:

- Does the model offer learning only, learning and career support, or learning and a job guarantee?
- Is the model funded by the student, the provider or the employer?



Models toward the top right have the greatest potential to unlock learning at scale. Models in the bottom left currently struggle to compete with university degrees, because unlike degrees there is no government-sponsored credit available to help learners finance these and it is difficult in a fragmented skills development landscape to guarantee the relative value of credentials. By contrast, employers have a real economic imperative to solve the skills gap.

Our research shows that although each of the technology-enabled models presents significant opportunities for growth, the extent of this potential will vary based on factors such as:

- Part-time vs full-time
- Asynchronous vs live learning
- Online vs blended vs in-person

Learners tend to have preferences across these modalities based on their personal and life circumstances.

Taken together, these models offer a vision where pathways for upskilling, reskilling and lifelong learning rest on multimodal options and stackable credentials which are pulled together, marketed and delivered in a targeted, data-driven way to benefit a wide range of post-16 learners. The key will be to ensure flexible, agile and seamless pathways through combinations of options for learners. This will require partnerships among education organisations, policymakers and edtech startups.

Emerging best practice

In order to better understand these emerging models and provide inspiration to education organisations, policymakers and edtech startups looking to make the most of these opportunities, we have collected examples of best practice from across the UK, Europe and the US.

Based on interviews with education organisations and learning providers, we can illustrate each of these four technology-enabled models with a short case study reflecting the skills development and employment strategy of each, and exploring the experiences of the learners under the lens.

Adult learners seeking to develop skills and find pathways into employment face a number of barriers, but there are indications that some of the technology-driven changes shaping the post-Covid future of post-16 education are already reducing those barriers, moving the sector closer to the 2030 vision of skills development that is data-driven, learner-centric and highly scalable. The range of challenges – and solutions – highlighted by these approaches offers an insight into the issues that need to be tackled in the medium term and the opportunities they present for long term growth.

Case study: Industry certification platforms

Coursera Academies, Guided Projects, and professional certificates

How does this model work?

Coursera, launched in 2012, is one of the largest online learning platforms in the world, with 87 million registered learners. Coursera partners with more than 200 university and industry partners to offer a broad catalogue of learning content and credentials, including Guided Projects, courses, specialisations, degrees and professional certificates – which enable individuals to prepare for entry-level jobs in specific disciplines.

Coursera for Business has built a series of Academies in skill areas required to solve common challenges experienced by organisations upskilling for digital transformation, such as finance, marketing, software, cloud & IT, data & analytics, and leadership.

“The concept behind Academies is how can we ensure that we are delivering job-relevant in-demand skills at the time that they are needed”, explains Crystal Chen, head of product marketing, Coursera for Business. The pace of change in technology means that by the time companies consult to assess their skills capabilities, design learning content and deploy it, the programmes are already out of date. “Can we leverage Coursera’s massive dataset on learning behaviours and learning skill profiles to surface what cutting-edge learning looks like, or what in-demand skills look like?”

Each Academy consists of expert-selected SkillSets, which are job-based content recommendations that help businesses target the exact skills proficiencies employees

need to develop for their role to remain competitive. SkillSets address a variety of use cases, including driving tech and data literacy, upskilling specific team members with specific tools, and reskilling employees for in-demand roles across the organisation. Within each SkillSet are learning content recommendations from world class universities, as well as Guided Projects: interactive tutorials that enable learners to gain a job-relevant skill in two hours or less, in a hands-on virtual environment. A side-by-side interface allows learners to watch visual instructions while applying what they learn on the other side of the screen.

What are the benefits of this model?

- **Rol**

A PwC study shows that 70% of digital transformation initiatives fail because of a lack of user adoption and behavioural change. Guided Projects bring several key benefits, including customised projects for the tools, technologies, processes and use cases of individual organisations, so that learners master skills in simulated real-world scenarios. Chen cites Coursera’s own research, which suggests that classroom training and applied learning is up to 45% more effective than theoretical learning alone. “Students without hands-on learning opportunities are 1.5 times more likely to fail, so that’s why we created the Guided Projects and link them to skill development because we want people to have a chance to apply what they have learned in a more real-world environment.” Learning takes place in cloud workspaces, without the need for costly software downloads or IT set up.



70% OF DIGITAL
TRANSFORMATION
INITIATIVES FAIL


“All of this learning and skill development activity is captured in our skills dashboard, where managers and learning teams can track measures and performance in real time. They can see how many learners are developing which skills, who is above or below target. You can then take action to send messages to learners, to encourage them or congratulate them. Then there are metrics like proficiency distribution, like how many learners or how many employees at my company are conversant in this topic, and what is their trend toward mastery over time. And then you can see, what are the courses that contribute to that skill? So you can further refine what content shows up in your learning programme.”

Crystal Chen

- **Learner impact**

Coursera Academies are powered by more than 300 SkillSets, which use data-driven techniques to target goals-based learning and measure impact. A given skill is assigned a target score between 0 (beginner) and 500 (highest level of proficiency), adjusted to suit the differing skill needs of each role. Learners are then presented with a tailored set of course recommendations that tie to their skill goals, creating a personalised learning plan. Based on the learner’s incoming skill profile and how they fare on assessments, the content recommendations will evolve over time.

“With SkillSets, we are solving for the problem of time-poor employees,” says Chen. “Individuals typically have little time to navigate large content libraries



SKILLSETS TAKE
THE GUESSWORK
OUT OF CONTENT
CURATION

to find what is most relevant for their job. Their managers do not have time to create tailored learning plans for them. And recommendations coming out of HR might not be specific enough. SkillSets take the guesswork out of content curation, and allow the employee to jump in and start learning what matters most to their role.”

When a learner successfully completes a course assessment, their corresponding skill score increases. Targets also benchmark to what top learners on the Coursera platform are learning and how they are performing. “In some of the early beta tests on SkillSets”, recalls Chen, “90% of learners said that they were highly motivated to learn because of this real-time skill tracking”. 87% of Academy learners taking courses within teams reported improved team performance.

How can this model be scaled?

Academies are already available through Coursera for Business and Coursera for Government, and Coursera is exploring rolling it out to Coursera for Campus, “because these are also skills that new graduates need to have when they enter the workforce. Part of Coursera’s mission is to provide access to world-class education for everyone and transform lives through learning.”

Using content from top universities and companies offers immediate scalability and credibility. “One thing our research found was that, especially when it comes to leadership skills and soft skills, the credibility of the teaching institution really matters. People want to learn these kinds of skills from trusted brands and trusted providers.”

A quarter of Fortune500 companies already use Coursera for Business, so scale can be achieved not just by acquiring new customers but also growing relationships with existing customers. Guided Projects, for example, can help businesses across a range of challenges, such as to provide more efficient onboarding for new employees, train staff for new technology rollouts, support ongoing workforce development and resolve ineffective work practices, or share best practice across the organisation.

“Our customers were demanding something like this, a solution for soft skills, because communication skills, emotional intelligence, resilience, leadership – all this is very much the traditional mandate of learning leaders. And in an era where all of your employees are distributed around the world, everybody’s working from home, you don’t have the same ability to offer face-to-face training, that’s where there was a need for the Leadership Academy, because businesses wanted to continue leadership development to address employee upskilling, new manager training, new hire training and culture building, and retaining talent through professional development opportunities. But they needed to do so in a way that could reach employees no matter where they were.”

Part of the roadmap for Academies is a diagnostic tool – currently available only in data analytics – where learners can get their skill levels assessed and receive recommended relevant skill sets matched to their current skill capability.

What were the main barriers in implementing this model? How were they overcome?

Chen recalls that “it was a much bigger technological and data challenge, with Leadership Academy, to compellingly package the content into SkillSets and to be able to recommend the right ones. The way that SkillSets work – skills need to be tagged to content, and assessments need to be tied to skills that are being developed – is a lot easier to do for data and technology disciplines than for something like soft skills or human skills. So after lots of testing we improved the algorithms around the way content was recommended, how skills were tagged, and are now able to offer this solution that develops soft skills at scale.”

For Chen, “when an organisation invests in learning, it is also giving the employee permission to explore that space, to do the kind of learning that can improve their lives by either increasing their earning potential or increasing their quality of life by the way they approach it. With the Leadership Academy, with categories of what leadership means from leading big transformations to leading oneself, the permission to learn and to give yourself the space to grow is implicit – it is coded into the way that the solution is designed. And I think there’s something very powerful about hearing from your workplace that it’s ok and it’s necessary for you to keep working on those skills. People spend the majority of their lives at work, so that’s the best place to reach them — to help build their confidence, to give them job-ready skills, and provide access to great ideas that can transform their lives.”

Case study: Bootcamps

Epicode School

How does this model work?

Founded in Rome in October 2020, [Epicode School](#) offers full-time online courses in full-stack, front-end and back-end web development over 12 weeks. Marco Rosci, co-founder and CEO, says “it’s a super practical approach with only one objective: finding a job for all of them”.

Epicode doesn’t target software engineering graduates, “because otherwise we keep on training the same people. We want to create a new generation of digital creators – students who are passionate about technology, but who’ve never written a line of code before in their lives”. The bootcamp costs €3900; students pay half upfront and half when they secure work.

“There’s a lot of demand in Italy, and all the biggest tech and consulting companies have already validated our model. Our students are working for big multinationals like Accenture, Ernst & Young, Capgemini and more, with a 100% placement rate.”

What are the benefits of this model?

- **Rol**


For Rosci, “it’s important that all the courses are developed in collaboration with the companies that students are going to work with. So when we launch a course, it’s months of interviews, calls, meetings with the companies to come up with the best possible programme in terms of the hiring needs that they have”. Epicode’s bootcamps combine generalist skills with some vertical courses on Microsoft, Adobe, Salesforce and more, depending on employer demand.

- **Learner impact**

A typical day sees mornings dedicated to theory and afternoons focused on practical group work projects alongside a tutor, who will also offer one-to-one feedback sessions. Each week a guest lecturer offers sessions for inspiration and motivation about the job market. Learners who complete the bootcamp receive an attendance certificate; this doesn’t correspond to industry accreditation because the course outcomes are job-oriented.

Tutors and professors require at least 15 years’ experience teaching in IT disciplines, to ensure high-quality training in a relatively short period of time. A careers service department organises sessions every two weeks to prepare students with interviews, CV writing, workplace readiness skills, and to facilitate their first steps into the job market.

With more than 30% of graduates female, Epicode is committed to reducing the gender gap in IT.



EPICODE IS
COMMITTED TO
REDUCING THE
GENDER GAP IN IT

How can this model be scaled?

The programme is fully online with the capacity to activate up to four cohorts, of 25 students each, per month (training a total of 100 new developers per month). In eight months Epicode has already trained hundreds of students, “and we have the objective to train more than 20,000 students in the next four years”. The bootcamp model is more mature in the UK and US than other countries with high demand for tech skills, such as Italy, which creates significant opportunities if courses can adapt to their particular training needs. Epicode has more than 230 companies in its network.

Epicode is pursuing two strategies to scale. After working with companies on dedicated projects around workforce reskilling and upskilling, it is now moving into recruitment. “We create tailor-made courses with employers. We recruit the students according to their standards, we put the students in the class to train them up, and they go to work.” In autumn 2021, Epicode will launch a self-paced programme, targeting people already in work or education who are unable to commit to an intensive bootcamp. Rosci expects to double Epicode’s capacity by using flipped classroom strategies such as pre-recording some teaching. The price will be lower to reflect fewer live classes.

What were the main barriers in implementing this model? How were they overcome?

Managing employer expectations can be a challenge. “It’s very difficult to recruit only tech graduate students – only 1% of graduates in Italy are in tech degrees – and it’s not our mission, but it’s a big target for the companies we work with, because they have super high standards”. Epicode adopted a data-driven approach, using personality tests developed in collaboration with higher education, and monitoring student performance on the job, to prove that non-tech graduates perform just as well.

The key, for Rosci, is learner motivation. The application process involves a three-hour lecture on coding basics, to test students’ interest, then a comprehension test, personality test and two interviews. Epicode’s retention is 95%.

“That’s also why we give a lot of space to personal growth sessions, because when you don’t know something, of course it scares you and you’re not motivated. If we give students a clear path they can imagine themselves into and if we give them the tools to accomplish those goals, they are more motivated and confident and everything changes. It’s a challenge, but it’s our responsibility – a role that our professional training institute must have”.

Case study: Workforce Transformation Companies

Revature

How does this model work?

Revature’s approach to developing technology talent upends the approach of technology staffing companies, selecting graduates from tech and non-tech backgrounds for a talent development programme that recruits, trains and places experienced software developers.

“We’re democratising getting into the world of tech,” explains Christian Campagnuolo, Revature’s chief marketing officer. Revature serves three main audiences: “The first are computer science majors who have been told there are so many jobs out there but who aren’t ready; they don’t have the soft skills, the hard coding skills, the teamwork abilities, so they’re not getting jobs. With us, they’re not only getting training but also the experience they need in real-world roles. The second group are STEM majors who have got a job in their field but quickly hit a ceiling and are thinking about career change. And the third group are ‘untapped potential’, who have a degree but are underemployed, undernetworked and drifting, and are not sure how to get out of that cycle. We’re offering them an offramp and a plan B for what to do next.” Employers might be apprehensive about hiring candidates with disrupted educational pathways or community college degrees, but Revature takes these candidates on too. “Diversity is a natural consequence of opening access.”

Candidates commit for two years, during which Revature pays a salary while they train before placing them on a client project. Revature works with around 50 enterprise clients in the US (including six of the top 10 global banks), as well as systems integrators and management consulting firms, such as Accenture.

“Our model is not for incremental staffing”, explains Ashwin Bharath, chief executive officer. “We become part of an organisation’s talent transformation strategy. So if a talent acquisition head says they need 1,000 people, we become part of this strategy to help hire 1000 people. We are an extension to our clients’ training and recruitment departments.”

What are the benefits of this model?

- **Rol**

Revature takes all the risk, investing in talent upfront; employers supply their pre-commitment, knowing that learners are specifically trained for their systems and environment, and will therefore quickly integrate into existing teams. Organisations partnering with Revature have on average experienced four times less attrition than the industry average, with costs 20% lower than direct employment and training. Revature also provides nationwide deployment and relocation, alleviating the burden from HR departments.

- **Learner Impact**

Candidates build their portfolio and test for certifications by working on real-world projects contracted by companies.

Revature’s focus is as much on soft skills as on technical skills. The programme is built around team working, presenting and simulating corporate environments, “because the industry wants continuous learners, so we don’t focus on theoretical genius.”

Most candidates are placed in roles within 13-17 months. Revature graduates have an employability success rate of 98.5%, with 89% retention after year four.



MOST
CANDIDATES ARE
PLACED IN ROLES
WITHIN 13-17
MONTHS

“They’re even working on code that was done by the group before, so it’s got bugs in it. We’re challenging them with scenarios that are foreign to them but they’re learning in real-time, so when we put them in place they already get it.”

Ashwin Bharath

How can this model be scaled?

It is a challenge to be bespoke and scalable simultaneously, but Revature’s solution is curriculum agility and a highly efficient operational model. “The key is how nimble, adaptive and efficient your training engine is,” says Bharath. “We believe there are three types of curriculum philosophy: perfection, efficiency and effectiveness. Effectiveness is the most important. The FDM group needs six months to change their curriculum; we need three weeks.” Revature has 55 curricula, with 100 full-time training staff and 100 support staff.

Revature also manages relationships at scale, across the US, Canada, Europe, and India. “We have 2.5m students with university partners – a company can’t manage these relationships at scale. We have six unique partnerships with technology firms – again, companies can’t build these skills into their own curricula.”

What were the main barriers in implementing this model? How were they overcome?

“Revature started as a staffing firm, but we realised after the 2008 economic crash that the US doesn’t have a training engine; programmers were getting pigeonholed with old skills. So we started with four people and got assignments for them in two days, and this became the starting point.”

The initial model was to hire and deploy locally, within 25 miles of homes, but this became a barrier to scale. Revature moved to the current model, oriented around recent graduates, in 2012, and several years later began establishing HE partnerships.

Covid-19 presented another challenge: “from fully classroom project-based training we had to transition immediately to online, but now we are having the best year.”

Case study: Employer-funded learning

Academy

How does this model work?

Academy’s approach scales insights from Ashley Ramrachia’s time at The Hut Group, which pioneered a model hiring high-potential but inexperienced graduates and training them in-house to create an accelerated pipeline of future leaders. After eight years, The Hut Group was creating 1,000 new jobs per year in north-west England and had become one of the top five graduate hirers in the UK by volume.

“At The Hut Group, pretty much every member of the management team except the founder comes from this model, so it was an unprecedented success. We were effectively creating our own supply of skills. When I left, I kept seeing the same problems in the wider tech ecosystem.”

Ashley Ramrachia, CEO, Academy

The tech economy is growing six times faster than the rest of the UK economy, but is characterised by young, nascent companies who lack the time, L&D infrastructure or know-how to support large graduate intake schemes and provide rigorous training

for internal promotion. A limited pool of skilled, experienced candidates leads to two recruitment problems in tech: vacancies consistently outstrip qualified applicants, and there are significant diversity challenges as candidates in this pool are often not representative of wider society. Academy engages high-potential graduates, regardless of prior experience or knowledge of software development, and places them into technology jobs while providing ongoing employer-funded training over two years.

Academy training is delivered virtually, alongside two week-long residentials at the start and end of the programme. Phase One is a five-week course (10 hours/week) designed to ensure foundational technical knowledge using project- and peer-based learning.

In Phase Two, learners undertake an intensive 12-week programme in full-stack engineering, collaboration and leadership. Using psychometric and values-based assessments, Academy then matches learners to an employer. For the next 21 months, Academy provides ongoing support, mentoring and coaching to help learners adjust to full-time, paid professional work, while learners continue to train part-time alongside their Academy cohort. At the end, learners join Academy Alumni, a community of faculty, mentors and fellow students.

What are the benefits of this model?

- **Rol**

The programme is free to learners, who also receive a grant towards living expenses during Phase Two. “You can’t charge the student,” says Ramrachia, “because you’re immediately capping opportunity as soon as you put any friction between the programme and learner.


To pay, they’ve already got to be convinced they want to enter the sector. And you’ve got to start with the biggest, broadest pool of people if your ambition is to increase the supply of high-quality talent, from people who might not ordinarily be looking at tech”.

Academy’s scaffolding around the learner benefits employers, who don’t always have the bandwidth to help with onboarding, coaching and mentoring.

- **Learner impact**

More than 50% of Academy’s intake so far have been women and minorities. “This is happening as a very natural consequence of the model, which creates conditions for diversity,” Ramrachia explains. “By selecting for aptitude, not academic background, we’re removing needless barriers to entry and diversifying the tech talent pool.”

Demand already outstrips capacity: Academy selects fewer than 1% of applicants.



ACADEMY'S
SCAFFOLDING
AROUND THE
LEARNER BENEFITS
EMPLOYERS

How can this model be scaled?

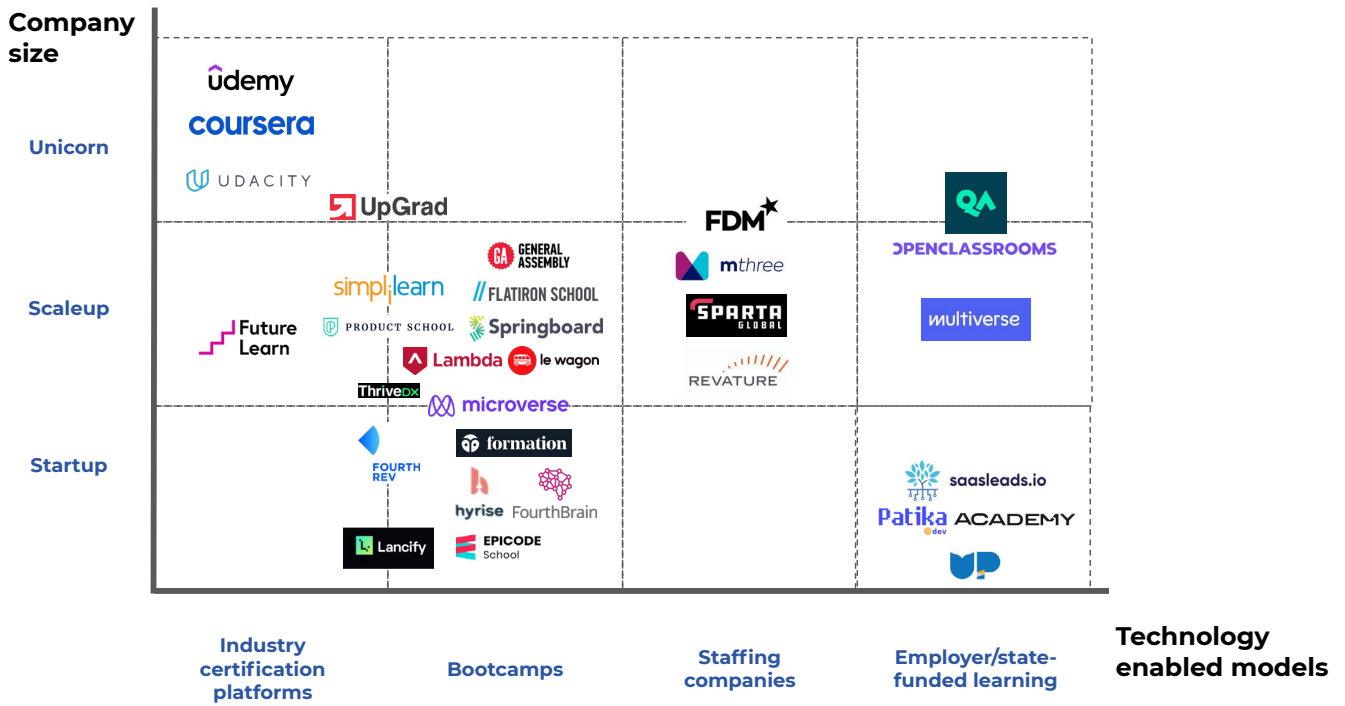
The Hut Group couldn't use graduate fairs to attract interest before it had built a reputation, so it began by talking to universities, identifying specific individuals and making pitches. By creating huge network impact, The Hut Group became a magnet. "Academy draws on the same principles – we have to find talent, not wait for it."

What were the main barriers in implementing this model? How were they overcome?

"We're trying to change the mindset of an entire industry. Tech is way behind on developing and investing in people."

Academy's decision to value potential over experience and academic achievement places particular emphasis on the application process to identify promising candidates. Academy partners with Thrive, using a selection of its aptitude tests to assess required attributes, in addition to a 45-minute video interview. Acceptance is also preceded by completion of a free, short immersive training in the fundamentals of software development – Academy Nano – where writing code to build a real-world interactive web app informs Academy's final evaluation.

Market map



03

Practical recommendations

In this part of the report, we look at some of the ways that policymakers, employers, educational organisations, and tech startups can work together to create data-driven, impactful opportunities that help post-16 learners navigate a variety of training options according to their individual needs and circumstances.

Recommendations for policymakers

1

Stop generating policies

Consistent, deliverable long-term strategies, coupled with targeted funding, is better than policy overload.

Next steps: the edtech demonstrator schools and colleges initiative lasted only two years but there is widespread enthusiasm for this to be revitalised.

2

Devolve skills policy

Devolved control of adult education budgets links employment and skills plans to local knowledge of skills gaps and opportunities. This has been the case with the Greater London Authority and other mayoral combined authorities in England since August 2019 – and it works. Local Enterprise Partnerships (LEPs) have increasing influence over sub-regional skills policy and funding for adult skills development.

Next steps: include apprenticeship funding – the main type of publicly funded job-related training – which is currently excluded.

“In FE, we have much stronger links to industry than is often recognised. When government talks about industry, they’re often referring to the 1% of big companies. When we talk about industry, we’re talking about the 99% of SMEs and microbusinesses who make areas thrive. They help us shape our curriculum and we help them with their local labour market requirements; it is a vibrant and productive partnership.”

However, as well as being firmly committed to serving the local area, we also have a responsibility to ensure that young people have the skills needed to compete with the very best in the world, so that no matter where they choose to live and work – locally, regionally, nationally or internationally – they are well prepared for the industry of their choice.”

Debra Gray, principal and deputy chief executive, Grimsby Institute

3

Focus on what gets people hired

Key skills development stakeholders - including educators, employers and sector bodies - need to come together and agree on a skills taxonomy. Unnecessary confusion between, for example “soft skills”, “human skills”, “meta skills” and so on impedes collaboration. The taxonomy needs to be pragmatic about *what gets people hired*.

Next steps: integrate accreditation bodies with the National Careers Service to ensure relevant qualifications.

4

Prioritise partnerships

Businesses can struggle to know what it is even possible to solve using technology, because the landscape moves so fast. Startups can solve many of these problems but don't know who to talk to, while universities tend to be risk averse when it comes to working with third-party providers.

Next steps: setting up a “trusted trader” mark for startups could make collaboration easier.

5

Take the lead on driving digital skills

A survey of staff at vocational and technical training providers found that only 9% felt that their institution's CPD policy would prepare them for the next five years. Jisc's [digital experience insight survey](#), from November 2020, found that one in six FE staff rated the overall quality of organisational support to develop digital skills as “poor”, “awful” or “worst imaginable”. Professional bodies need to help teachers upskill but Ofsted lacks the expertise to inspect or benchmark good digital practice.

Next steps: create a digital journey plan so that staff can pick up skills and ideas at the right pace for their practice, with reference to resources such as ET Foundation's [digital teaching professional framework](#), Jisc's [building digital capability](#), and the European Commission's [digital competence framework for educators](#).

Recommendations for educational organisations

1

Play your part in communities of practice

A fragmented skills landscape results in limited collaboration and inefficient knowledge sharing between different professionals and providers.

Next steps: Ufi and ALT's [annual audit](#) identifies sector bodies, tech companies and independent practitioner groups organising around common themes, such as the [AmplifyFE](#) network.

2

Wake up to microcredentials

Qualifications are years behind employer skill demands, while employers often struggle to understand the core competencies demonstrated by academic qualifications. Embedding skills-oriented digital badges in existing courses starts an employability/skills passport for learners to build on when they leave formal education.

Next steps: as part of ongoing curriculum review, faculties should identify industry-relevant credentials aligned to existing learning content for every course.

3

Act on data in curriculum decisions

Institutions still underestimate the disconnect between education, learner skills proficiencies, current industry demand and future skills requirements. It can be difficult to consult with employers at scale on curriculum design, and businesses themselves often don't know which skills are required for their digital transformation.

Next steps: audit curriculum to identify new opportunities for employer involvement in placements, projects and assessments, using [Emsi's data](#) as benchmark.

“Bootcamps are very much teamwork programmes – you’re not just looking at each student’s strengths, you’re looking at the collective skills basket. Understanding at the start how to distribute people and what groups might work well; understanding where there might be deficits – this is the next stage of what we do with learner analytics. Particularly when you have quite diverse starting points, as you tend to in CPD programmes. Recent graduates, people in their late 40s/50s looking at second career paths – that’s a rather different group of people to have in a classroom. You can’t rely on intuitive understanding to get that mix right fast enough. So the question is, how might the data be able to help us?”

Professor Nicola Wilkin, director of education, College of Engineering and Physical Sciences, University of Birmingham

4

Get serious about digital roles

All staff need some level of digital literacy, but this does not mean everyone needs to become digital experts. Institutions need to invest in learning technology professionals with specific skills in designing, procuring and implementing edtech, and training other staff to use it effectively. The most successful colleges and universities are investing to build capacity internally.

Next steps: the Association of Learning Technology [provides information](#) on the changing needs of institutions, the growth of this role, and examples of how institutions are investing right now.

5

Track learning in real-time

Unlike generic learning objectives, which assess the same critical skills over and over again across Levels 3-7, data can provide meaningful, granular insights into learner progress and outcomes in real-time.

Next steps: The University of Northampton uses changemaker goals on graduate employability as part of [a toolkit](#) to inform learning outcomes, which in turn informs staff performance reviews.

6

Be ready for tomorrow's jobs

While most institutions already have an employer engagement strategy, all should have a specific strand focusing on emerging industries and future jobs, to ensure that colleges, universities and employers work together in response to rapidly evolving circumstances.

Next steps: Local Enterprise Partnerships can act as a hub for this process, ensuring a consistent understanding of the skills landscape.

Recommendations for employers

“What businesses care about is their organisational capability to do things better, and that’s more than just skills. It’s organisational capability that is going to help a company build a sustainable competitive edge. The skills agenda has to flow into that.”

Shuvo Saha, former director, Google Digital Academy

1

Stop asking for CVs

The state of job descriptions is dismal. A lack of high-quality skills data means organisations don’t understand the skills and competencies required to successfully perform a given role. Inadequate job descriptions lead to poorly targeted adverts, a defective interview process, inefficient onboarding and poor talent mobility. Recruiting on skills, rather than past experience, is necessary to get more diverse people into posts.

Next steps: asking candidates for portfolios, rather than CVs, shifts the focus away from qualifications and towards competencies. Job descriptions should be compiled in terms of skills, not more general knowledge areas or experience.

2

Commit to a data-driven culture

Most businesses use data to support decision making, but in this year’s [NewVantage Partners executive survey](#), only 24% said they had “created a data-driven organisation”. The principal challenge cited was not technology (7.8%) but organisational culture, processes and skills (92.2%).

Next steps: invest resources in a well-defined data strategy, aligned to overall business objectives. Without it, you will struggle to collect, interpret and leverage data for better outcomes.

3

Define ‘skills’ for your organisation

To identify skills gaps, you need to understand what ‘skills’ are in your organisational context, and then link skills to jobs and roles. Employers need to get to grips with skills data before mapping their organisation.

Next steps: Knowledge transfer partnerships enable an impartial observer to evaluate an organisation’s current range of skills. Local skills improvement plans provide a detailed starting point.

4

Prioritise reskilling, not upskilling

Organisations have a responsibility to help their employees better understand their transferable skills. Businesses are typically less successful at reskilling than upskilling, because reskilling requires an organisation to work multi-functionally. Yet companies such as Amazon are initiating their own programmes aimed at skilling, upskilling and reskilling their workforces in-house.

There is value in building relationships with individuals by supporting them with their own development: 87% of Multiverse apprentices stay with their employers long-term, and 50% are promoted within six months.

Rather than assuming skills gaps are deficits to be immediately remedied, look at potential – how to help a person develop into a role, and keep an open mind as to what can be developed easily given the right tools and frameworks.

Next steps: performance reviews should take an organisational view, combining individual career aspirations with future jobs required by your company. Organisations such as Faethm and FutureFitAI use data analytics to assess, reskill and transition employees within an organisation.

5

Defy job obsolescence

As automation shrinks the boundaries around jobs, many low-skill, low-paid jobs are effectively being designed to deskill those working in them. But obsolescence is not inevitable: use skills pathways to redesign entry-level and at-risk roles.

Next steps: using the data and skills infrastructure outlined above, entry-level jobs and those at risk of automation should form a pathway offering opportunities to develop new skills and progress.

Advice for founders

1

Differentiate through process excellence

Content will not be a difference maker in this crowded marketplace. All bootcamps build key features such as careers services, robust curriculum, strong employer networks and so on. How will you deliver better student experience and outcomes? For example, Springboard uses virtual internships and one-to-one mentoring, matching every learner with an expert practitioner in their target industry to provide weekly tailored support including goal setting, progress tracking and technical feedback. These are operationally difficult to scale – Springboard has 1,000+ mentors – but students say they are leading reasons for choosing them. Learners need to trust this is the right choice for them, which could mean evidence around employment outcomes, salary increases, and/or alumni endorsements.

“I’ve been training people in factories for 20 years; the best engagement, retention and application of knowledge to produce long-term behaviour change has always come from: ‘let’s work together on your patch, solving real problems’. I don’t understand why people are still pushing vanilla training solutions. Writing an algorithm to personalise a skill isn’t always easy, but if we’re going to get learners engaged, they have to feel like we’re not teaching them what they already know.”

Russell Watkins, co-founder, Sempai

2

Pull a fast one

Speed, agility and specialism are where technology-enabled models can differentiate from traditional providers: providers refresh 10-15% of their curriculum each year on average, though some are as high as 75%. Source and respond to a continuous data flow about market skills requirements and learner aspirations.

“What’s really important with any new learning programme is to test and learn and test and learn, because you only make the programme effective in its impact and help people change their behaviours if you’ve refined it a few times. Providers don’t learn as fast as they could, partly because the stakes can be high if you get things wrong with customers. With the Google Digital Academy, we found charity organisations who would be delighted to have free or very low-cost programmes. That was great for them, because they wouldn’t normally be able to afford the services we were providing. And it was great for us, because we were able to learn on the fly and get feedback from real people very quickly. Look for the win-win. Education is one of those things where there is a nobler purpose, so make a difference where you can.”

Shuvo Saha, former director, Google Digital Academy

3

Identify appropriate credentials

The preferred credential (associate degree, industry certification, badge, or job outcome) will vary based on industry and location, but providers should understand the relative value that stackability and portability can bring to enable continued upskilling and career progression. [Resolution Foundation data](#) on training and job re-entry from previous recessions found that longer-term training, full-time education or training associated with an employer was most likely to result in people returning to jobs; short bursts of modular and/or part-time training was less associated with either switching industries or getting back into the job market at a higher rate. Time commitment or connection to a specific outcome can affect perceived value. Accreditation can act as a proxy for quality, and as a gateway for government funding opportunities.

4

Manage intake to set learners (and employers) up for success

A “bums on seats” model can lead to poor quality learning experiences in large cohorts. Create steps in the application process to validate learner interest, fit and commitment. For example, Microverse offers free content to learners before applying, which establishes expectations from the outset. Providers who do not manage their intake effectively because of pressure to scale too rapidly will fail to deliver strong outcomes or serve learners that they cannot sustainably support. Where learning is employer-funded, integrate employers with your admissions process to get the right candidates through the door.

“Giving people confidence in the process is important. The most promising solutions we’ve seen have connections through to individual stories – people who were already working in those jobs, who can tell a story about how they got there – or connections directly to training programmes which learners can apply for, so there’s immediate action they can take.”

Louise Marston, director of ventures, Resolution Foundation

5

Signpost pathways

Be clear about your learners’ starting point and the learning pathway you are building. For example, Kenzie Academy offers different related job pathways, so if a learner is struggling with one pathway they can consider pivoting, rather than dropping out. Scaffold towards learning opportunities after the course finishes; the initial focus may be employment outcomes, but learners will also need a pathway to future skills building in association with that career. This is especially true of short courses and bootcamps.

“One of the cementing elements for a group of learners is the induction process. Doing that remotely is far more difficult. We recommend a lot of collaborative activities in order to build that shared understanding of who we are, what we like, and how we can build confidence and support one another. Induction needs to set up the rules of engagement; this framing of learning can be far more important than delivering the content.”

Vikki Liogier, national head of edtech and digital skills, Education and Training Foundation

6

Be transparent about pricing

Usage-based pricing tends not to work as well as price-per-student for education organisations, who need certainty before committing to contracts. Where possible, shift financial risk off students, whether through income-share agreements, deferred tuition job guarantees, or employer financed models.

7

Look for ‘hard to reach’ learners

Those most in need of skills development typically lack the confidence, time, motivation and/or knowledge to actively seek out training opportunities. Partnerships with FE colleges and Jobcentre Plus referrals can meet these learners where they are, but community-based organisations can also be effective partners. Housing associations, community centres, churches and social hubs use existing channels to inform members about new opportunities, such as routes into education and training. These established networks can also attract employers as they look to make good on corporate social responsibilities by bringing in more underrepresented workers. In San Francisco, the nonprofit MissionBit, which provides coding education to young people living in poverty, connects its students to a tech sales apprenticeship programme offered by Vendition.

Q&A with Anthony Tattersall, vice president enterprise at Coursera



Coursera, launched in 2012, is one of the biggest online learning platforms in the world, with 87m registered users. Coursera for Business works with more than 2,700 customers, including 25% of the Fortune 500, to build programmes that drive in-demand skills development, while Coursera for Government works on workforce upskilling and citizen development projects to ensure that everyone is able to access the job market. Coursera also works with 3,200 university campuses to ensure students are equipped with appropriate skill sets to enter the world of work.

What trends are you seeing around skills from your users?

The core things that drive an organisation's capabilities are the skills people have and their ability to exploit technology. Where businesses are really switched on to this, they're focused on understanding skill requirements for roles right now and in the immediate future, and finding the best way to address that gap. The challenges are how to make learning happen within their flow of work, and how to use reskilling to create roles internally where hiring is not easy, such as tech, data science, cybersecurity and so on.

In our work with governments we see lots of countries struggling with graduate unemployment, partly related to the pandemic and partly because businesses want to hire people who already have the skills they need. There are many countries with large numbers of people based in industries at high risk of being automated out, and these are often lower paid jobs – if those individuals aren't given access to learning opportunities to develop new skill sets, there simply won't be enough jobs to serve those people.

For universities, it's not just about getting someone that first job after graduating, it's also about all the moments of career transition that people will experience over their lifetimes. Most people entering the workforce now will go through four or five major career shifts involving significant upskilling, and universities have an increasingly important role to play. But they are also experiencing challenges – there is a big focus on employability outcomes, and workplace skills are a fast-moving target, so learning content ages quickly. And how do you work with a higher expectation of blended learning programmes?

What is Coursera's approach to skills development?

At our core we're a skills transformation platform, so we're trying to enable people to learn anywhere in the world, at a time of their choosing, with access to the very best content from major universities and industry partners. The goal is to use applied learning to improve skills, whether upskilling (improving current skills in your area of expertise), reskilling (getting you into a completely new area of expertise), or deep skilling (to really develop a level of mastery).

The second thing we do is work with organisations to define the skill sets required for each role, and at what level of capability. Then we can take individuals, look at where they are and help them understand their skills gaps so they can develop. All of our content is assessed, in some cases multiple times as you're progressing through it, so individuals can see how well they're progressing towards those skills goals and so organisations can build a landscape of their skills, at specific levels of mastery.

How does Coursera use data to improve outcomes for learners and organisations?

We have 87 million learners on the platform globally, across all age ranges, personalities, demographics; some people in work, some people out of work, and so on. The size of that dataset makes it very robust. We can see what skills people are working on and what jobs they're doing to understand the underlying skill sets for those roles, and we can also see what their career trajectory is over time, so we understand how those skill sets lead to role changes. Feedback loops ensure all those data aggregation insights resonate with individuals actually taking our courses, who can reflect on the skills they think they are learning.

All this has helped us build a detailed skills taxonomy, with tens of thousands of skills, which we can correlate with third-party data sources, such as the World Economic Forum, to map at a very granular level what we think future skills requirements will be.

We also have a team of skills transformation consultants who work with businesses, governments and institutions to build programmes specific to their goals. Around 10% of the organisations we work with are big enough to invest in this, so if they already know exactly what they want to achieve, we can map our catalogue to those specific skills development needs. But the vast majority recognise that the world of skills is rapidly changing and they don't have a clear view of exactly what needs to be done over the next 2-3 years, on a per role basis, so they come to us for that guidance.

What should skills development look like in 2030 to create alternative pathways into jobs?

Someone once said to me that we overestimate the level of change we'll see in 5 years and underestimate the change we'll see in 10. Ten years is long enough for something no one saw coming to totally disrupt the marketplace. Education is one of the last bastions that hasn't been disrupted and while the pandemic has accelerated change, I still think we're at the very, very early stages.

I would love to see the education system become a lifelong learning partner, rather than a discrete point in time at the earliest stage of your career. That will involve more partnerships between governments, businesses and education organisations

- and I think the focus for universities then becomes more about accrediting programmes, contextualising to local needs, and curating a range of content that creates opportunities for people to develop skills they need. I hope we'll see more democratisation of access and ways to evaluate people's capabilities beyond a degree: more professional certifications, more corporate universities, and more professional organisations offering alternative learning paths.

And I hope that by 2030 it's a normal expectation that whatever your job, a percentage of your time is dedicated to learning, so managers are empowered to support it and all company processes are wrapped around that.

What advice would you give to a startup in this space?

First, you need to have a product that is solving an unmet need for an organisation. When you're not solving a problem, it doesn't matter how cool your tech is, no one's spending money. The second thing is having a clear view of the value that you're going to get from that solution. Is it an important problem? Is it a big problem? If you solve that problem, what's the impact? And then the third piece is how defensible your solution is, because if you come up with a really cool idea but a big organisation like IBM or Amazon can replicate it in a weekend, your market is done, because they're going to get economies of scale. If you can find those three things, then you have a window to create interest before you have to fend off competition.

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Emerge Education is a European edtech seed fund investing in world-class founders who are solving the \$8.5tn skills gap. Emerge is backed by strategics such as Cambridge University Press, Cambridge Assessment and Jisc, as well as the founders of globally renowned Edtech companies. Together, we are building the future of learning.

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