emerge education

Jisc

The start of something big?

Can edtech startups solve the biggest challenges faced by UK universities?

Assessment rebooted

From 2020's quick fixes to future transformation

Employability rebooted

Democratising the future of work

Universities UK

Handshake

janison

emerge education

Jisc

The start of something big?

Can edtech startups solve the biggest challenges faced by UK universities?

From fixes to foresight: Jisc and Emerge Education insights for universities and startups

Contents

Foreword

At Jisc and Emerge Education, we believe that education technology (edtech) has rich potential to help UK universities solve their biggest challenges.

We see edtech startups as key to the innovation and agility that higher education needs to navigate the rapidly changing present and future. This is a critical part of building a sector that is resilient to unforeseen changes and that can further transform using advanced technologies, as part of our vision for an Education 4.0.

We have worked as close partners for several years and our collaboration brings together Jisc's 30+ years of experience in providing digital solutions for UK education and research, and Emerge's in-depth knowledge of the edtech ecosystem based on investments in 55 startups in five years. Together, we've developed unique insights into the potential of edtech in higher education.

To unlock that potential, we're undertaking a programme of research. It's focused on exploring the most urgent priorities that university senior leaders will face over the next three years, which we investigate in-depth in this first report.

Priority one
Delivering the best, most equitable student experience.

Priority two
Adapting to student evolving expectations about employability and career outcomes.

Priority three
Expanding the university's reach by attracting more (and more diverse) students.

Priority four
Transforming digital and physical infrastructure.

Priority five
Recruiting, retaining and developing world-class staff.

Each report in this series explores aspects of each priority in more detail, mapping current approaches and challenges, and highlighting specific edtech solutions and startups. The reports draw on the expertise of leaders from HE, employers and startups, through Jisc – Emerge Education advisory groups on specific topics, including the future of assessment, the employability journey of students from non traditional backgrounds, student recruitment in challenging times, employer university collaboration and the student mental health and wellbeing challenge.

We find that there are plenty of opportunities for startups to hear from each other but very few for them to hear from real customers – universities – and understand in depth the priorities they have and the problems they are facing. This report series does that, providing startups with the information they need to shape their products so as to ensure they meet university needs. For universities, the series offers insights into how the sector is managing change as well the possibilities for the future.

The work on the reports was well underway when the COVID-19 pandemic hit, and we have seen the university sector adapt more rapidly than many thought possible to the challenges of digital delivery. But in the midst of crisis, it is important to draw a clear line between our immediate response and what it tells us about the future. The reports in this series seek to look across the immediate and long-term time horizons to give readers a map and compass out of the current situation and towards the future of higher education. Ultimately, we want to build a vibrant, highly effective edtech ecosystem, with seamless collaboration between universities and leading startups, to ensure students get the educational experience they deserve.

Paul Feldman
CEO, Jisc

Nic Newman
Partner, Emerge Education

Executive summary
Main findings

In this report we identify the most pressing priorities and sub-priorities for the sector over the next one to three years.

We have specifically highlighted the unmet needs of universities and the areas where start-ups can add the most value. Universities have expressed a strong desire to innovate but have not always been able to execute this due to a range of persistent barriers.

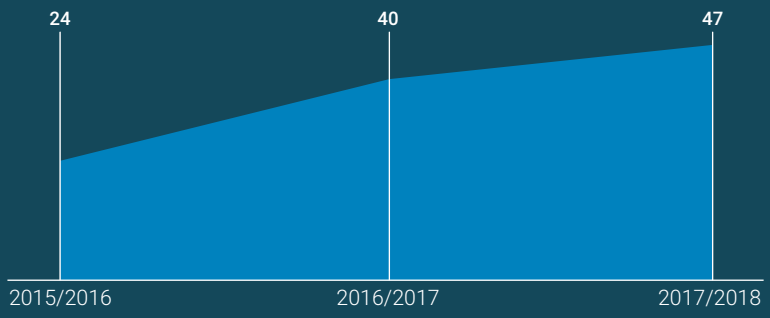
The insights in this report have been designed to support start-ups and universities to work together more effectively to achieve the key priorities outlined below.

For this report we interviewed more than 50 senior decision-makers in HE and they told us that financial sustainability is the most common challenge facing universities. This aligns with recent news stories describing growing financial pressures within universities and with the findings from consultancy firm PwC's April 2019 Higher Education Sector Risk Profile, which **highlights 'financial sustainability' as the single biggest risk factor**[1] for the sector.

Figures 1-3 highlight some of the major trends relating to this challenge.

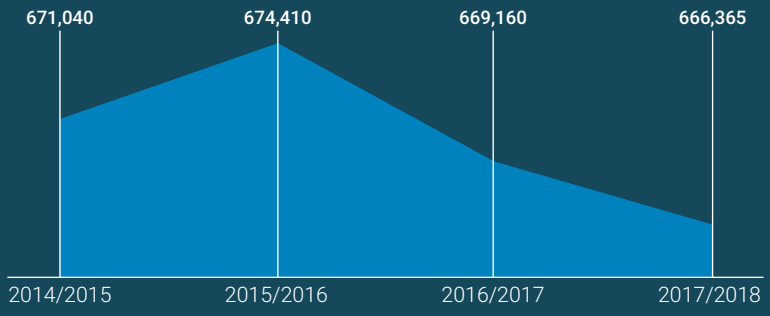
Declining financial sustainability is the most common existential threat facing universities across the sector.

Figure 1: The number of UK HE providers in deficit has almost doubled from 24 in 2015/2016 to 47 in 2017/2018



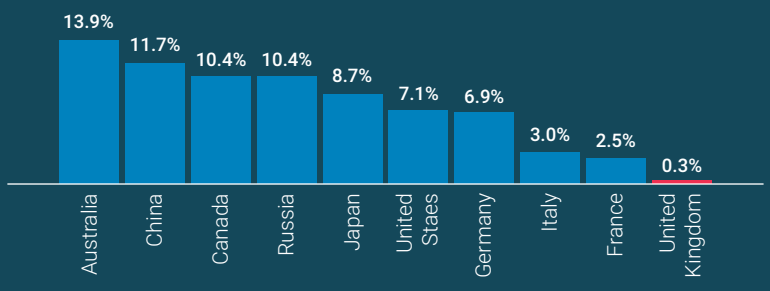
Source: hesa.ac.uk/data-and-analysis/finances/kfi

Figure 2: Total undergraduate enrolments decreased by 1.7% between 2013/2014 and 2017/2018



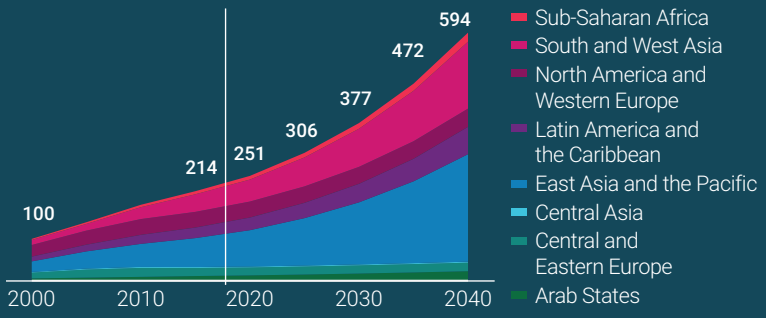
Source: hesa.ac.uk/data-and-analysis/sb252/figure-3

Figure 3: The UK has by far the slowest growth rate when it comes to international student recruitment[2]



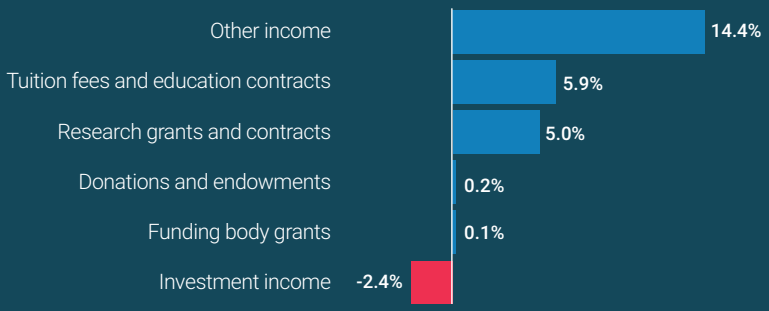
Source: universitiesuk.ac.uk/International/Documents/2019/International%20facts%20and%20figures%20slides.pdf

Figure 4: Global HE enrolment is projected to double over the next decade and reach c380m by 2030



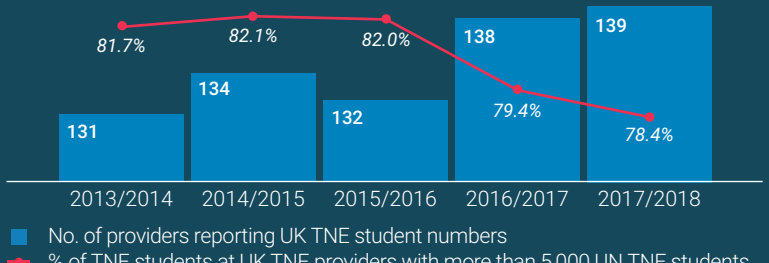
Source: academia.edu/36975860/Massification_of_higher_education_revisited

Figure 5: Between 2016/17 and 2017/18, growth in 'other income'[3] significantly outstripped all core revenue streams



Source: hesa.ac.uk/data-and-analysis/finances/chart-1

Figure 6: Record numbers of HE providers are now engaging in transnational education (TNE)



Source: universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2019/the-scale-of-uk-he-tne-2017-18.pdf

Innovative universities can unlock more growth through new models and markets than ever before.

While financial stability is an important challenge, we've identified significant growth potential for universities that innovate to expand their reach, enhance the student experience and diversify their revenue streams. In this report, you'll find examples of ways they can do this, including collaborating with employers, extending online learning and enhancing their use of data. Figures 4-6 highlight trends associated with these opportunities.

As outlined overleaf, we structured this report around universities' five most pressing priorities based on our research with senior leaders. These five priorities are interlinked, so work on one priority will inevitably affect the others. We know research is also a priority for universities and we will include this in our future reports.

1 pwc.co.uk/government-public-sector/education/documents/higher-education-sector-risk-profile-2019.pdf

2 When comparing the top ten host countries for international students in 2016 and reviewing percentage changes since 2015.

3 **Other income** (hesa.ac.uk/support/definitions/finances) includes all non-research income for services rendered to industrial and commercial companies and public corporations. It includes all validation fees for courses such as those run by other HE providers.

Based on interviews with 50+ key decision-makers in HE, we've identified the five most pressing priorities and associated sub-priorities for universities in the next one to three years.

Putting the student first

Priority one: Delivering the best, most equitable student experience

- Utilising learner analytics to personalise the student experience at scale
- Developing alternative forms of assessment to meet diverse student needs and evolving employer requirements
- Establishing a seamless digital learning environment to enable the implementation of pedagogical advancements and adapt in line with changing student preferences
- Improving student navigation and signposting, for example, through mobile apps for way-finding, chatbots for query handling, and voice-activated services for improved student engagement

Priority two: adapting to changing student expectations about employability and career outcomes

- Rolling out of employer mentoring at scale to boost employability for students while also improving the recruitment pipeline for employers
- Co-designing the curriculum with employers to deliver up-to-date and relevant courses for students
- Increasing engagement with schools and colleges to provide more effective and consistent career support across the full lifecycle from school to employment
- Increasing opportunities for student entrepreneurship to meet growing demand as more than **25% of university students run or plan to run their own business**[4]

Broadening the university's horizons

Priority three: expanding the university's reach by attracting more (and more diverse) students

- Scaling online learning and digital credentials to provide high-quality teaching for larger and more diverse groups of students
- Growing partnerships with FE colleges and international universities to increase the accessibility of UK university courses (eg through the franchising of degrees)
- Enhancing brand reputation and league table rankings to build eminence in domestic and international markets
- Boosting the level of direct and real-time engagement with prospective students (eg through VR campus tours, query-handling chatbots, peer-to-peer connections)

[4] independent.co.uk/news/business/indyventure/university-students-business-more-than-quarter-santander-turnover-a8207161.html

Enhancing the foundations

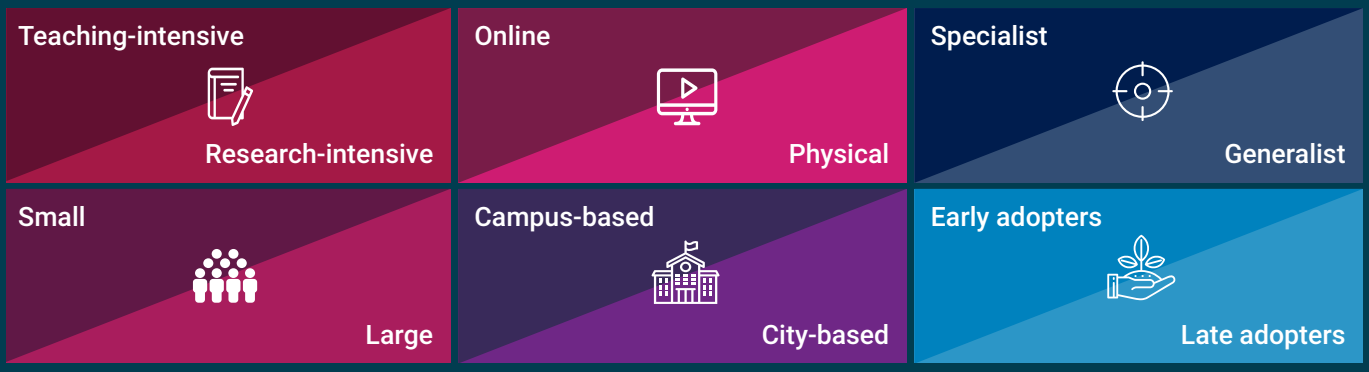
Priority four: transforming digital and physical infrastructure

- Establishing seamless integration between the vast range of different systems that are used by students, staff and academics at each university
- Adopting enterprise-wide cloud technology, including solutions for students such as automated query-handling, and also staff-centred services such as payroll processing
- Optimising the use of space, for example, through replacing fixed hardware and wired devices with mobile devices and wireless technology
- Co-creating new solutions by bringing together academics, professional services staff and other relevant stakeholders

Priority five: recruiting, retaining and developing world-class staff

- Providing continuous and on-demand training for academics and staff, particularly around developing key competencies such as leadership and digital skills
- Establishing a collaborative culture with agile ways of working by breaking down the organisational silos that often exist between academics and professional services staff
- Improving signposting for academics and staff to help them effectively navigate their way across the complex range of systems, services and resources that are available
- Automating time-intensive tasks, particularly in the case of high volume, repetitive and rules-based tasks such as assessment marking

Our conversations have shown that the relative importance of each priority depends on the university context, and startups should be aware of this:



We've explored each priority in turn, and this report looks at the associated macro trends, sub-priorities and barriers that startups should think about when working with universities.

Key takeaways for universities

The priorities and sub-priorities in this report are the issues that universities will expend most time, money and effort on in the next three years. Senior leaders need robust, data-driven strategies in line with the institution's needs. Universities can use this report to cross-check and validate institutional priorities against those of peers in the sector.

At Jisc and Emerge, we support universities and startups to pursue these priorities through our **step up programme**[5].

Key takeaways for startups

In each section, there are insights to help startups initiate productive conversations with universities and begin to tailor effective solutions. At the end of each section we've highlighted some practical advice to help startups maximise the impact of their solutions for universities.

[5] jisc.ac.uk/rd/get-involved/step-up-programme


Open
Event
Friday 22 June
11.00am – 2.00pm

Priority one: Delivering the best, most equitable student experience

Definition

Since the start of this century there's been a significant shift in HE towards marketisation as universities operate in an increasingly competitive environment and students demand more value for their money. Now, 'student experience' is near the top of the agenda for most university senior leaders but it's hard to pin down what the phrase really means. Every student's experience at university is unique as they juggle learning with an increasingly wide variety of additional university services, from study skills workshops to mental health support. In response to increasing student demands universities are playing a bigger role in more aspects of their students' lives.

Changing demographics in the student body are also adding complexities. For example, in 2018, **20.7% of 18 year olds from the most disadvantaged areas in England entered HE**[6] compared with 11.2% in 2006. Student populations within UK universities are more diverse than ever before.

To iron out the complexities and establish a common frame of reference we have defined this priority:

Definition: This priority encompasses all the key aspects of a student's life during university, including learning, teaching, support, assessment, administrative tasks (eg module selection) and extra-curricular activities.

To address this priority successfully, universities will have to optimise their services across each of these aspects in ways that meet the needs of every student.

Universities can measure their progress in relation to this priority through:

- **Teaching Excellence Framework (TEF) rating** – this measure focuses on performance around learning, teaching and student outcomes
- **National Student Survey (NSS) scores** – these enable universities to assess their students' satisfaction across key points in the student journey
- **Student retention rates** – by analysing the proportion of student drop-outs across different demographics, universities can assess the quality and equity of student experiences
- **Attainment gaps** – similarly, analysing gaps in learning outcomes across different groups of students can identify differences in student experience as well as potential failure to bridge any gaps that existed before the students arrived at university

Context

What is university for? **This is a question that's been debated a lot**[7], but it's widely agreed that at least part of its purpose is to enable people – regardless of background – to pursue knowledge in their chosen field and access the career opportunities they want. To fulfil this purpose, universities have to give students a robust and equitable experience – so this is a priority for all university leaders. It is also related to several other key challenges. For example:

Growing domestic and global competition – domestic competition between universities has reached an all-time high. At the same time, global competition has sky-rocketed and **the UK looks set to lose its position as the second most popular destination for international students**[8]. The trend towards globalisation in HE is clear from the 2018 Times Higher Education (THE) university rankings, with **Britain being surpassed for the first time as the second most represented country in the rankings**[9]. These trends are likely to continue as shown by Figure 3, which shows that out of the top ten host countries for international students, the UK has by far the slowest growth rate when it comes to international student recruitment.

UK universities must stand out and attract more applications by providing the best possible student experience.

Continuation and attainment gaps – as the student population becomes more diverse, universities must adapt. This is particularly important for students from under-represented and disadvantaged backgrounds, **who are more likely to drop out of university**[10] and also tend to achieve worse results than their peers. Figures from the Office for Students (OfS) show that **a number of these continuation and attainment gaps have got bigger**[11]. Universities will have to spend more and focus harder on delivering a more personalised and equitable experience for all students.

Student mental health issues – student need for mental health support is growing and this often means longer waiting times for existing services. A 2018 survey of 37,500 students in UK universities by Insight Network **found that over half had thought about self-harming**[12]. Universities must implement preventive measures and provide more targeted support. To be effective, support services have to deliver a balanced, complete university experience for all students, especially the most vulnerable.

Sub-priorities

To improve the student experience holistically universities are exploring various options, including:

Learning analytics and personalisation – recent technological developments present opportunities to tailor services to individual needs at scale (eg through personalised learning platforms). Learning analytics is also playing an important role in improving universities' preventive measures targeted towards at-risk students who need extra support. Through greater personalisation universities will deliver more consistent, better experiences for all students including distance learners, part-timers and ones from disadvantaged backgrounds.

6 universitiesuk.ac.uk/facts-and-stats/Pages/higher-education-data.aspx
7 pearson.com/uk/educators/higher-education-educators/course-development-blog/2018/04/what-is-the-purpose- of-a-university
8 ucl.ac.uk/news/headlines/2018/jul/australia-beats-uk-overseas-students
9 independent.co.uk/news/education/education-news/times-higher-education-world-university-rankings-britain-uk-global-reputation-league-tables-a8555736
10 gov.uk/government/news/education-secretary-warns-universities-over-dropout-rates
11 officeforstudents.org.uk/data-and-analysis/continuation-and-transfer-rates/continuation-non-continuation-and-transfer-rates
12 theinsightnetwork.co.uk/uncategorized/university-student-mental-health-survey-2018

Alternative forms of assessments – traditional forms of assessments (eg dissertations and exams) don't suit everyone. They're also not the best way to evaluate soft skills, creativity and divergent thinking and they might not match up with assessments used by employers. Some universities are exploring alternatives such as audio and video, group submissions and machine-moderated online assessment.

A seamless digital learning environment – because students are digitally savvy, universities must adapt their learning and teaching offerings to become digital-first and mobile-friendly. Many are moving towards a blended learning model with more of the learning and teaching moving to online environments. As part of this strategy they're testing augmented reality (AR) and virtual reality (VR) technologies to bring students immersive learning experiences and develop their digital skills. Some are also developing their use of digital learning environments such as online social learning platforms to give students more real-time engagement with their peers and with academics.

Better student navigation and signposting – now that there are more touchpoints between universities and their students, it's important to signpost students so they can navigate their way through university life effectively. Universities are tackling this issue in several ways, with mobile apps for wayfinding, chatbots for query handling and voice-activated services for improved student engagement. And they're progressively looking towards examples from commercial sectors (eg Amazon, Apple and Monzo) in their drive to provide students with consumer-grade experiences.

Barriers

Inevitably, there are obstacles on the road to success with this priority:

Problems collecting and maintaining accurate data – mismatched systems, inconsistent practices and constraints around data privacy are common challenges for universities. They make it harder to keep student data current, particularly given the fast-changing nature of the student body with drop-outs, course changes etc.

Lack of diversity in the university workforce – as the student body becomes more diverse the university workforce should reflect this but it is often challenging, particularly at senior management level. This lack of diversity can make it tougher to meet the needs of all students.

Limited student engagement and motivation – **research shows that the number of disengaged students is increasing**[13]. It's hard for universities to offer effective support for these students because they often don't attend even core lectures and classes. And, as universities start to offer different kinds of courses with less time spent on campus, it becomes trickier to support engagement and provide a consistent, high quality experience.

[13] researchgate.net/publication/331181094_Exploring_Student_Engagement_and_Disengagement_in_University_Education_Can_Vocational_ActivitiesPractice-Based_Learning_Help

Practical advice for startups

When talking to university senior leaders about the student experience, startups should remember:

Observation	Implication
Rising levels of domestic and global competition have led many universities to invest more in the student experience as a key differentiator.	Startups in this space can meet university senior leaders' needs by tailoring their solutions to improve the brand perception of current **and** prospective students.
Although the student body is becoming more diverse, university services have seen only limited change.	Startups can help plug this gap through learning analytics and artificial intelligence (AI) to deliver more personalised services for students.
Disparate datasets and inconsistent student information are a problem for many university senior leaders.	Startups offering solutions that can collect, analyse and visualise student data and also integrate with existing university systems will be able to stand out.
Increasing numbers of students with mental health issues and declining student retention rates are putting more pressure on student support services.	Startups can help to ease the pressure and align their solutions more closely with university needs by removing the admin burden for staff and enabling more targeted interventions.

The average tenure of a job has fallen to 4.5 years[14] and today's workers will probably have ten to 15 different jobs in their lifetime.

Priority two: adapting to changing student expectations about employability and career outcomes

Definition

A 'job for life' is a thing of the past. Figures from Deloitte show **the average tenure of a job has fallen to 4.5 years**[14] and today's workers will probably have ten to 15 different jobs in their lifetime, so the word 'career' is changing its meaning. People now define their own career paths with various steps ranging from sabbaticals and secondments through to continuous online learning and technical bootcamps. The fluid nature of modern careers must be reflected in the definition of our second priority, because universities will have to prepare their students for the very many opportunities that await them when they graduate.

The huge rise in the number of students graduating each year has led employers to develop new recruitment practices to differentiate more effectively. To stand out, graduates need more than the signalling benefits of a university degree; they need to demonstrate a range of skills and attributes including emotional intelligence, adaptability and creativity. To summarise what we mean by employability in these contexts we have defined this priority below:

Definition: Adapting to evolving student expectations for employability outcomes means that students will be able to develop a strong understanding of potential career opportunities which are aligned to their interests, and gain valuable experiences to build the skills, attributes and networks required for effectively pursuing their desired opportunities after graduation.

Specifically, progress in relation to this priority can currently be measured by universities through:

- **Graduate Outcomes**[15] – administered as a survey by HESA to all graduates 15 months after they finish their studies, Graduate Outcomes provides insights into the current status and perspectives of recent graduates
- **Longitudinal Education Outcomes**[16] **(LEO)** – LEO data provides information on how much UK graduates of different courses at different universities are earning one, three and five years after graduating
- **Student work experience** – the length and quality of work experience gained by students over the course of their degree can indicate their future employability
- **Career surveys** – surveys to assess awareness of career opportunities and analyse sentiments around entering the workplace (eg confidence levels) can highlight intangible factors that also impact employability

Context

The world of work is changing and labour deficits are growing at an alarming rate, with the OECD **predicting the global labour deficit will reach £6.5 trillion by 2030**[17].

14 deloitte.com/uk/en/pages/consulting/articles/putting-meaning-back-into-work.html
15 graduateoutcomes.ac.uk/
16 universitiesuk.ac.uk/our-work-in-parliament/Documents/Universities
17 oecd.org/employment/outlook/

These macro trends have had significant implications for universities and **questions are being asked about their ability to prepare students for employment**[18].

At a micro level, career considerations have become increasingly important for UK students following huge increases in tuition fees in 2012. Student debt has reached record levels and recent government figures show that **only about 17% of students will fully repay their student loans**[19]. It's a significant debt burden (on average, £50,000 for a UK student) and it is leading students to ask more questions about the value for money provided by university degrees. In summary, these issues are causing universities to prioritise student employability and career outcomes:

Growing student focus on career outcomes – because prospective students now think more about future careers when they choose a university, institutions must focus on improving student employability. It's important for domestic and international students – in a recent survey international students highlighted **the three most important outcomes when graduating from university**[20]: high graduate employment rates, a high rate of students going into their preferred industry and how quickly students find employment after graduating. The combination of rising tuition fees and increasing graduate numbers have resulted in greater career-consciousness across the student body.

Rapidly changing employer needs – university courses often haven't adapted in line with employers' changing requirements and employers are responding in a number of ways, including removing degree requirements from entry-level roles, adopting more apprenticeships and providing more in-house learning and development opportunities. To stay relevant and support their students in the jobs market universities must incorporate industry requirements within their course offerings.

Government pressure to tackle the skills gap – universities are producing graduates in record numbers but job vacancies are being left unfilled, and the OU Business Barometer found that **UK businesses spent £4.4bn on addressing skills shortages in 2019**[21]. These shortages are particularly acute in the case of digital skills and more than two-thirds of employers are struggling to fill vacancies for digital roles. This is a critical challenge for the economy and the government wants universities and other education providers to find a solution. The government's **2019 Review of Post-18 Education and Funding**[22] suggests several skills-focused proposals, including strengthening technical education and encouraging universities to bear down on 'low value degrees' and to provide more courses that align better with the economy's needs.

Sub-priorities

Traditionally, universities have improved career outcomes for students by supporting them to gain work experience (through internships and

18 theguardian.com/education/2018/dec/20/how-do-universities-prepare-for-jobs-that-dont-yet-exist
19 https://fullfact.org/education/about-17-students-are-forecast-fully-pay-back-their-loans
20 qs.com/graduate-employability-matters-more-than-ever
21 open.ac.uk/business/Business-Barometer-2019
22 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/805127/Review_of_post_18_education_and_funding.pdf

placements) and improving their job applications (typically, through CV workshops and networking events with employers). Now they are also exploring new sub-priorities including:

Rolling out employer mentoring at scale – creating opportunities for employers to mentor students gives students first-hand insight into the workplace, develops their soft skills and improves their understanding of professional behaviours and attitudes. And the mentoring relationship works for employers too, giving them opportunities to improve their graduate recruitment pipeline by better understanding and supporting prospective candidates. This model is increasingly being scaled across a number of UK universities, often initially through alumni networks.

Working with employers to co-design the curriculum – universities are showing more appetite for incorporating employer input within curriculum design. One important example is the Institute of Coding (IoC) a consortium of 150+ organisations to bring industry, government, higher education and outreach partners together to create new courses, develop existing skills and provide support to attract fresh talent into digital careers. Launched as a £20 million government initiative in 2018, **the IoC now has more than 32,000 learners**[23] enrolled on over 100 digital skills courses created with industry input.

Boosting engagement with schools and colleges – universities and employers can play a significant role in determining career outcomes but a student's background, their schools and colleges also pay a part. Research by the Institute for Fiscal Studies (IFS) shows that **independent school students earn 8% more than state school students, five years after graduation**[24]. These gaps already exist when students enter university and universities are working harder to collaborate with schools and colleges and provide more effective, consistent careers support. Guidance from the Office for Students (OfS), the HE sector's regulatory body, strongly encourages this approach to raising prior attainment in support of its **access and participation plans**[25].

Developing opportunities for student entrepreneurship – today's students have grown up in an economy transformed by the astronomical rise of technology start-ups. **More than 25% of university students run, or plan to run, their own businesses**[26] and the estimated total turnover of graduate-founded businesses and social enterprises has risen from £669 million in 2014/15 to £821 million in 2017/2018. To support students and address employers' growing needs for students with an entrepreneurial mindset, universities are investing more resources in fostering student entrepreneurship.

> *"In our 2030 strategy, we have outlined a clear commitment to turn the university into a full incubator"*
>
> Professor Anne Carlisle OBE, vice chancellor and chief executive at Falmouth University

23 https://instituteofcoding.org/news/new-stories/2019/12/the-institute-of-coding-enrols-32000-learners-onto-digital-courses
24 ifs.org.uk/publications/13035
25 officeforstudents.org.uk/advice-and-guidance/promoting-equal-opportunities/access-and-participation-plans
26 independent.co.uk/news/business/indyventure/university-students-business-more-than-quarter-santander-turnover-a8207161.html

Barriers

Universities have identified a number of obstacles that they'll need to address:

Organisational silos – effective career support requires a consistent approach that brings academics together with careers services staff but often these staff groups operate in silos, with limited alignment between the services they each provide for their students. University senior leaders say there must be a fundamental shift in mindsets to overcome this barrier.

Social stigma towards vocational education – universities need to develop more vocational courses with a stronger focus on skills development to address the labour deficit. It may be hard to recruit students to these courses in sufficient numbers because vocational qualifications have typically been stigmatised in the UK. Higher Technical Qualifications are a case in point – the **DfE's report on higher technical education**[27] says only 10% of UK adults hold these, compared with around 20% in Germany and as much as 34% in Canada. Universities will have to overcome this stigma to ensure the success of new vocational and skills-based courses.

Lack of career readiness – when students start at university they often don't know much about the world of work or their potential career opportunities. In 2019, **a survey conducted for Universities UK (UUK)**[28] identified better career information and the career experiences of past graduates as the two things that students and recent graduates had wanted to know about before applying to university. This is problematic for universities, particularly in the case of disadvantaged students who have more limited access to careers advice at school, are less likely to have completed professional work experience, and lack useful social networks to learn about careers or access work experience opportunities, according to **research published by upReach in July 2019**[29].

[27] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/814938/Higher_technical_education_case_for_change.pdf

[28] universitiesuk.ac.uk/news/Pages/Government-is-wrong-to-focus-on-future-salaries-%E2%80%93-new-survey-of-students-and-graduates-suggests.aspx

[29] https://upreach.org.uk/wp-content/uploads/2019/07/upReach-Research-Career-advice-and-opportunities.pdf

Practical advice for startups

When talking to university senior leaders about student employability and career outcomes startups should remember these key takeaways:

Observation	Implication
Universities face growing pressure from students, employers and the government to provide more courses that meet employers' needs better.	Startups can help to plug the gap between universities and employers by using technology platforms to enable collaboration at scale (eg course co-creation, work-based learning, career navigation).
Universities and employers both have strong reasons to improve student employability but universities face tougher budget constraints.	Startups can build better relationships with universities by setting their pricing model to reflect both relative budget size and the direct recruitment benefits that employers will realise.
Students from different backgrounds have very different levels of exposure to the world of work as well as differing confidence levels and awareness of career opportunities.	Startups can address this challenge by providing equal access to opportunities for all students via technology-enabled, high quality careers support (eg employer mentoring).
University senior leaders place strong emphasis on the need for ongoing support to improve student employability and career outcomes.	Startups can add real value for senior leaders by providing an up-to-date view of student profiles alongside evidence-based recommendations about how to support each student's career journey.

139 universities now have students studying through TNE[30].

Priority three: expanding the university's reach by attracting more (and more diverse) students

Definition

Until quite recently the delivery of teaching at a university rarely extended beyond the physical campus so student numbers were constrained by the size of a university's real estate and physical infrastructure. Online learning is one development that universities are taking advantage of to overcome these limitations.

They're also working on franchising their degrees so students can gain accreditations from one university by attending a partner institution, whether that's in the UK or overseas. Transnational education (TNE) – the provision of education from institutions in one country to students in another – is developing fast and UUK's report on the scale of UK HE TNE shows that a record **139 UK universities now have students studying through TNE**[30]. Developments such as this, alongside policy reforms that have led to a **doubling of student numbers between 1994 and 2018**[31], mean that UK universities have access to diverse groups of students all around the world.

"There is often a narrative that certain groups of students are 'hard to reach', when the reality is that it is the university that is hard to reach for these students. The narrative needs to be flipped and there should be a greater focus on making universities more accessible for students"

Dave Hall, COO at the University of Leicester

Universities can measure their progress in relation to this priority through:

- **Student application figures** – the number of applications received by a university reflects its ability to compete locally, nationally and internationally
- **Student enrolment** – the make-up of the student body across different forms of provision (eg physical vs. online) can demonstrate the accessibility of a university's courses
- **University course offerings** – diversity in the course portfolio can act as a leading metric for future shifts in university student demographics
- **Access and participation plan targets** – universities can measure their progress against these OfS targets to assess their ability to attract and enrol UK students from under-represented backgrounds

Definition: To achieve against this priority universities will attract more students by delivering high-quality, flexible education that is increasingly accessible and suited to the needs of larger and more diverse groups of individuals (eg learners from different areas and countries, socioeconomic backgrounds and stages of life).

30 universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2019/the-scale-of-uk-he-tne-2017-18.pdf

31 https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7857#fullreport

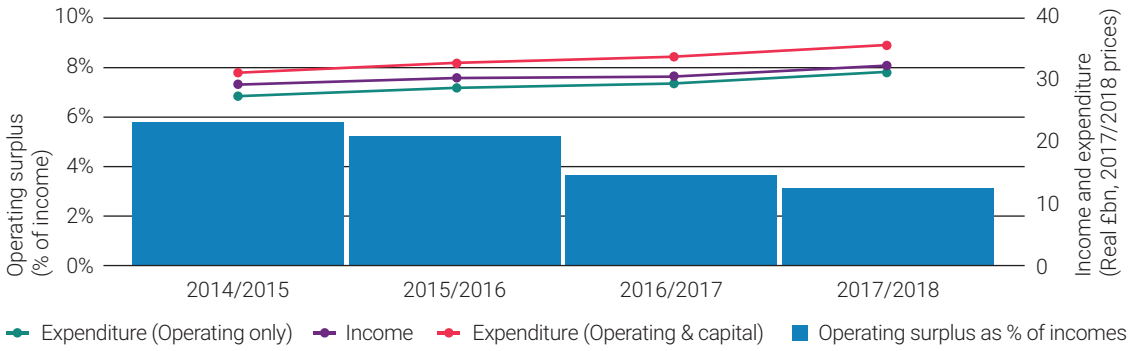
Context

For UK universities, tuition fees are by far the single highest revenue stream, **representing almost 50% of total income in 2017/18**[32] according to HESA figures. As a result, the HE sector's financial health is fundamentally reliant on student numbers. Universities feel this reliance acutely given the strict cap on the fees they can charge for UK undergraduate degrees. Following the government's **review of post-18 education and funding**[33] in 2019, official recommendations have been made to reduce this price cap from £9,250 to £7,500, leading to fresh concerns about financial sustainability for large numbers of universities. Their concerns are exacerbated by the effects of rising global competition and ongoing uncertainties about Brexit's impact on international student recruitment. It's against this backdrop that student recruitment has moved up the priority list.

But universities also have cause for optimism because **total HE enrolment worldwide is expected to more than triple over the next two decades to reach c. 600 million in 2040**[34]. The growth will be driven by rising demand for HE in emerging economies, and also the need for adults to upskill and reskill throughout their careers. These trends offer universities huge potential to diversify and expand their reach to different kinds of learners. Overall, university senior leaders cite two main reasons for the critical importance of expanding university reach:

Financial sustainability – as universities continue to operate in an environment where cost increases outstrip revenue growth, financial sustainability is an existential threat. This challenge is depicted in Figure 7 below, which shows the almost 50% reduction in operating surpluses that universities have experienced between 2014/15 and 2017/18. Alongside falling surpluses, universities have seen a 31% increase in debt levels between 2016/17 and 2017/18 according to a **report on financial sustainability produced by the OfS**[35]. The OfS forecasts that university borrowing will

Figure 7



Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/805127/Review_of_post_18_education_and_funding.pdf

[32] hesa.ac.uk/data-and-analysis/finances/income
[33] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/805127/Review_of_post_18_education_and_funding.pdf
[34] academia.edu/36975860/Massification_of_higher_education_revisited?auto=download

rise by 11% over the next four years, resulting in higher debt servicing costs. Add to this the ongoing restructuring of staff pension schemes and there's an urgent imperative for universities to generate more revenue. This challenge is already affecting the US, where **more than 350 colleges closed during 2017 and 2018**[36].

Growing demand for tertiary and life-long education – **more than half of young people in the UK now go to university**[37] and demand for places will rise in the coming years. What's more, individuals will need to upskill and reskill regularly, making the 25+ age category an exciting growth opportunity. Growing demand for HE in international markets also presents a range of possibilities for universities; for example, a recent study by the Royal Melbourne Institute of Technology (RMIT) **suggests that countries in sub-Saharan Africa are likely to become sunrise markets**[38] for HE by 2035.

Sub-priorities

To expand reach and adapt to these trends universities are exploring a number of different sub-priorities including:

Scaling online learning and digital credentials – online learning has significant growth potential, both for existing course materials delivered on-campus to wider audiences and for development of new courses exclusively for online provision. This approach widens university reach and tackles the needs of more diverse groups of individuals; it also enables universities to convert more students to on-campus degrees and to enhance pedagogical methods.

> *"Across all our traditional courses, we have 18,000 students on campus. Now, just on our mathematics for machine-learning module alone, we are reaching 180,000 learners through the internet – contributing to tackling the immense skills gap in this domain"*
>
> Gideon Shimshon, director of digital learning and innovation at Imperial College London

Growing partnerships with other education providers –partnerships with FE colleges and international universities offer effective ways to make a university's courses more accessible for different and diverse groups of students, as TNE programmes have shown. Recent changes in government policy have also led universities and colleges to collaborate more in delivering technical education. For example, the £170 million roll-out of Institutes of Technology (IoTs) in 2019 has created new university-college partnerships and enabled university foundation degrees to be delivered at FE colleges. This is part of a wider call from the government for **more choice and availability of courses for learners**[39] and for more universities to expand their technical education offerings, particularly through partnerships with colleges and the development of new qualifications at levels 4 and 5.

Enhancing university reputation and rankings – brand reputation and league table rankings influence a university's ability to attract new

35 officeforstudents.org.uk/media/cf54b6ee-714e-45c3-ade9-56bc685b861d/report-on-financial-sustainability-of-higher-education-providers-in-england.pdf
36 https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7857
37 independent.co.uk/news/education/education-news/university-students-young-people-over-half-first-time-a9122321.html
38 academia.edu/37036613/The_higher_education_landscape_is_changing_fast?email_work_card=title
39 universitiesuk.ac.uk/blog/Pages/seizing-opportunity-higher-technical-education.aspx

students. Frameworks such as the Teaching Excellence Framework (TEF), and university league tables such as the QS World University Rankings and Times Higher Education (THE) University World Rankings use proprietary calculations with weighted indices to evaluate HE providers. And although the specific methodology varies, categories such as research quality and student satisfaction will usually have significant weighting in each one. To enhance brand value, universities may target their investments towards areas that give the best return in terms of their brand value.

Boosting direct engagement with prospective students – increasing the level of direct and real-time engagement between the university and prospective students is particularly significant given the importance of word-of-mouth in attracting new students and the ease with which universities can engage directly with prospective students via technology. Universities have been exploring new solutions including VR campus tours, query-handling chatbots and peer-to-peer connections between prospective and current students. New physical campuses in international regions are also a good way to boost direct engagement with prospective students and other education providers outside of the UK.

> *"Our physical campuses in Malaysia and China provide us with the opportunity to engage better with students in the region and build stronger partnerships with local education providers and employers in a way that would otherwise never be possible"*
>
> Dr Paul Greatrix, registrar at the University of Nottingham

Barriers

Universities have identified a number of obstacles that they'll need to address:

Lengthy lead-time for course development – although university senior leaders often want to develop their course offerings, the lead-time from concept to launch of a new course can be two or more years. Why? Approval and procurement processes are often lengthy and quality assurance frameworks are stringent; timeframes are often longest for innovative courses such as stackable credentials. This makes it difficult to maintain an up-to-date course portfolio that meets students' and employers' needs.

Balancing quality and consistency with scale – quality and consistency can suffer when universities try to widen their offer and attract bigger, more diverse student groups. Differing needs in different disciplines can also make it hard to roll out changes at scale. For example, it's relatively easy to adapt online learning for business courses but more complicated for subjects such as art and architecture. These challenges are particularly pertinent in the context of international university partnerships, where international providers will be subject to quality assurance processes that are very different to those in the UK.

Relying on agents to reach international students – universities often rely on locally-based third party agents to help them recruit overseas students. Agents take care of key parts of the process but they also bring challenges of their own. Fundamentally profit-driven, they focus on increasing student application and enrolment numbers rather than on connecting individual students with the universities that are the best fit. This mismatch of priorities is hard to overcome, as there is limited regulation and no global standard on how an agency should operate.

Practical advice for startups

When talking to university senior leaders about expanding the university's reach by attracting more (and more diverse) students, startups should remember:

Observation	Implication
International student recruitment is a leading priority for many universities but these students can be hard to reach and universities often rely on third party agents.	Startups can enable universities to access prospective students directly in international regions (eg via VR campus tours, chatbots and peer-to-peer connections).
University leaders face challenges and long delays in adapting courses to changing market demands.	Startups can help to cut course development time, particularly for new online and short courses, by making use of templates and introducing best practice from other institutions.
UK universities want to develop partnerships with other education providers, both domestically and internationally, to gain access to more diverse groups of students.	Startups can enable more seamless collaborations through shared databases and integrated systems (eg to deliver stackable credentials).
As UK undergraduate tuition fees flatline, universities are putting more emphasis on attracting different kinds of students (such as adult learners who need to upskill).	Startups can help universities reach untapped markets by opening up new channels and providing specialist capability to target new groups of learners.

The rapid pace of technological change offers opportunities for universities to make big changes fast.

Priority four: transforming digital and physical infrastructure

Definition

As digital has become a core component for all HE providers, a university's technology architecture has become at least as important as its physical infrastructure. Over time, universities have developed intricate technology ecosystems comprised of hundreds of different tools and platforms. These intricacies have made it difficult to summarise the term 'digital infrastructure' and so university senior leaders have identified Gartner's Pace-layered Application Strategy[40] as a framework to help in understanding what is meant by digital infrastructure. In summary, a university's digital infrastructure can be segmented across the three layers of this framework as outlined below in Figure 8.

The university's physical infrastructure is its land, buildings and physical facilities. With these two definitions in mind, we have defined our fourth priority below.

Definition: Universities can realise this priority by implementing a joined-up digital and physical estates strategy that meets the needs of all key stakeholders including students, staff and third parties (eg partner colleges, local employers and regulatory bodies such as the OfS).

Universities can measure their progress in relation to this priority through:

- **Staff productivity** – although measures will vary, longitudinal data can be used to evaluate how new systems and processes affect staff productivity
- **Use of space** – tracking how buildings and facilities are used, particularly outside term time, makes it possible to assess how efficiently the university's physical infrastructure is used
- **User feedback** – staff and student feedback can be used to understand the qualitative impact of changes to digital and physical infrastructure
- **Data quality** – measures of data quality (eg completeness and consistency) are a useful proxy to evaluate digital infrastructure and systems integration

[40] gartner.com/en/information-technology/glossary/pace-layered-application-strategy

Figure 8

Systems of innovation	• Next competitive advantage
Systems of differentiation	• Unique processes • Current competitive advantage
Systems of record	• Standardisation • Operational efficiency • Compliance

Context

University senior leaders often say that university operations and services depend on the underpinning digital and physical infrastructure. In line with Gartner's Pace-layered Application Strategy universities must make sure they have the right systems of record because these are the foundation for all other systems. Universities may want to innovate and adopt new technologies such as learning analytics and chatbots but they can't do so without robust systems of record and effective data management practices. Similarly, the physical spaces in a university affect every interaction that takes place on campus. As universities grow their digital and physical presence, the integration between digital and physical infrastructure becomes ever more important.

This priority is also very important because of digital technologies' transformative potential. The rapid pace of technological change offers opportunities for universities to make big changes fast. In summary, university senior leaders highlight these main reasons to invest time, effort and money in this priority:

The critical and growing importance of data – since the introduction of the OfS in 2018 universities have faced increasingly stringent regulation; they have to produce new reports and provide accurate and up-to-date datasets to meet OfS requirements. They also want to make more data-driven decisions so they can, for example, allocate resources effectively and initiate effective support for students who are vulnerable or at risk of falling behind. All key decision-making is critically reliant on robust datasets and therefore on the university's digital infrastructure.

Rising university costs – as outlined in the HESA data cited earlier, university costs are growing faster than income, creating greater pressure on universities to streamline costs and operate more efficiently. The bulk (54%) of university expenditure consists of staff costs and this figure may rise in the face of **ongoing strikes over pay and pensions**[41]. University spending is now also carefully scrutinised by students and the government because of rising student contributions and growing levels of debt. Universities have responded by providing greater transparency on costs, for example through UUK's recently published **guide to presenting institutional financial information to students**[42]. To mitigate the twin challenges of rising costs and growing demands for value for money, university senior leaders have focused on transforming their digital and physical infrastructure.

Increasing need for organisational agility – today's economy is more fluid than ever before. As universities have an obligation to prepare students for the dynamic modern workplace, they need to be agile to stay relevant. There's a fundamental need for universities to establish organisational agility and to develop flexible digital and physical infrastructure.

41 bbc.co.uk/news/education-50459152
42 universitiesuk.ac.uk/policy-and-analysis/reports/Pages/value-for-money-guide.aspx

Sub-priorities

University senior leaders break down this overarching priority into several sub-priorities including:

Establishing seamless systems integration – many universities have complex technology architecture in place and more than 200 systems across their campuses. This creates a critical need for seamless systems integration to enable effective tracking of the millions of interactions that take place between the university's systems and its users each year. Establishing a 'single source of truth' – that is, a single master dataset which can be triangulated across all systems – is a key outcome of this sub-priority. Reliability, integration and interoperability are the three key principles for any new technology solutions.

> *"Integration between new and existing technology solutions is a key priority for us, and so we've introduced a new policy whereby third-party providers who want to work with the university must provide us with access to all raw and processed data"*
>
> Ian Dunn, provost at Coventry University

Adopting enterprise-wide cloud technology – cloud technology is the enabler for most university services from solutions for students such as email and automated query-handling to staff-centred services like payroll processing and knowledge sharing. Adopting cloud technologies has brought universities many benefits, notably freeing up staff time for more creative tasks and also cost savings.

Optimising use of space – property constraints have potential to limit university growth so senior leaders are taking a fresh look at how spaces are constructed and used. They're exploring how to unbundle the student experience and evaluating which steps in the student journey could be delivered digitally. Space optimisation initiatives are leading universities to create flexible spaces on campus, replacing fixed hardware and wired devices with mobile devices and wireless technology. Another focus area within this sub-priority is commercialisation of a university's physical assets, for example by using existing buildings as event spaces and summer schools.

Co-creation of solutions with key stakeholders – any change in a university's physical or digital infrastructure will only succeed if it's accepted by the staff, academics and students who are affected. Often, this depends on how well the change meets their needs and how much they have been involved in creating the change. Senior leaders know this and they are taking a co-creation approach when they need to implement changes or develop new technology solutions.

Barriers

Time and cost aren't the only barriers. University senior leaders have also identified these:

Resistance to change – staff resistance to change can break a plan to transform digital and physical infrastructure. For instance, it can be difficult to incentivise risk-averse staff and academics to use a new technology solution, particularly if they see no clear benefits in changing. They might also suffer from change fatigue as a result of bad experiences with previous university change programmes.

A complex and rapidly evolving ecosystem of solutions – new providers and technologies often appear in the market and this can create problems for universities around maintaining an effective and up-to-date technology stack. Just keeping up to date with innovation and startups is time consuming. Jisc and Emerge developed **Step Up**[43] to support members to identify robust startups to work with. We produced **'Championing the untapped potential of startups'**[44] to help institutions and startups build stronger partnerships. The situation gets more complex when senior leaders have to consider the practicalities of integration, as enterprise systems may integrate with some tools but not others. This also often leads to confusion for staff members, given that there may be no consensus on what is the best tool to use in which scenario.

Inconsistent ways of working – as universities grow it gets harder to maintain consistency right across the university and to take account of different ways of working. This is a challenge when it comes to rolling out a new system or process. Inconsistencies at a faculty or team level can have knock-on effects throughout the university, and a huge impact on the effectiveness of enterprise-wide digital and physical transformation.

43 jisc.ac.uk/rd/get-involved/step-up-programme
44 jisc.ac.uk/guides/championing-the-untapped-potential-of-edtech-startups

Practical advice for startups

When talking to university senior leaders about transforming digital and physical infrastructure, startups should remember:

Observation	Implication
Data and integration often present universities with challenges, because they have many disparate systems across different teams and facilities.	Startups that can integrate their solution seamlessly with existing university systems will have a significant advantage.
Universities want tailored solutions that suit the particular needs and nuances of their own institution.	Startups can set themselves apart by demonstrating detailed knowledge of specific university needs (eg based on student demographics) and by working closely with institutions to co-create solutions.
Physical space can constrain growth, particularly for city-based universities faced with the high cost of buying land and buildings.	Startups will help universities deal with this difficulty if they can can reduce the need for more space by digitising processes and optimising space allocation.
Universities are concerned about how to maintain an up-to-date technology stack that's adaptable to new and emerging technologies.	Startup solutions – and the constant refinement and iteration that go with them – can offer advantages over traditional enterprise systems for universities.

430,000 people are employed by the 164 HE institutions in the UK, with just over half on non-academic contracts.[45, 46]

Priority five: recruiting, retaining and developing world-class staff

Definition

According to the latest **HESA Higher Education Staff Statistics**[45] 430,000 people are employed by the **164 HE institutions**[46] in the UK. Just over half are on non-academic contracts while the rest deliver teaching and/or research.

University HR functions face the same challenges and complications that you'd find in most large organisations – staff recruitment targets, handling employee queries, managing learning and development (L&D) requirements. We have defined this priority below:

Definition: Achieving this priority will enable the university to attract applications from leading academics and professional services staff, with successful applicants going on to make up a collaborative, cohesive workforce with the skills and tools to deliver the university's strategy effectively.

Here's how universities can measure their progress towards this goal:

- **Time to hire** – looking at how much time elapses between when a candidate is first engaged and when they accept the offer can reveal the recruitment team's efficiency
- **Staff turnover rates** – looking at the percentage of the workforce that leaves over a certain period of time; often this is influenced by the quality of the university's staff experience
- **Staff feedback and job satisfaction** – this information shows the qualitative impact of changes to the university's staff experience
- **Training effectiveness** – pre-training and post-training assessments can be used to evaluate the impact of L&D

Context

Universities' various student experience initiatives have increased pressures on staff. For example, the growth in online courses and delivery and pedagogical advances like gamification and immersive learning have meant academics and professional services staff need to upskill.

University staff play a vital role in delivering a university's services and day-to-day operations. For this reason, as well as those below, university senior leaders are making staff recruitment, retention and development a top priority:

Accelerating pace of change – it's a common theme throughout this report. To adapt and benefit from technological advances and to meet changing student requirements universities must develop staff skills and establish an agile working culture.

Political and regulatory uncertainty – the political and regulatory landscape is shifting constantly. As we've seen, the introduction of the OfS in 2018 as HE's regulatory body brought a number of significant changes to the sector and more changes are in the pipeline. These, along with the political uncertainty presented by Brexit, create significant difficulties for universities and their staff members.

45 hesa.ac.uk/news/24-01-2019/sb253-higher-education-staff-statistics
46 universitiesuk.ac.uk/facts-and-stats/Pages/higher-education-data.aspx

For example, the possibility of new visa regimes and complex immigration processes cause staff to worry about job security and place talent pressures on universities because **31% of UK academic staff have a non-UK nationality**[47].

Disparities in the student experience – with more courses and an increasingly diverse student body it is becoming harder for academics and staff to maintain consistency in the student experience. Some universities are trying to diversify their workforce to foster a more inclusive environment on campus. Ultimately, the ability to keep standards consistent across widely varied courses depends on the quality of the staff.

> *"Equality, diversity and inclusion (EDI) is an enormous priority for us, especially given our position as one of the most diverse universities in the country. We are constantly working to increase the diversity in our staff and leadership to ensure that our staff body best represents and supports the needs of our student body"*
>
> Mark Anderson, chair at London Metropolitan University

Sub-priorities

Providing continuous and on-demand training – up-to-date training needs analysis enables senior leaders to identify and address existing capability gaps. These gaps are widest in the case of digital skills and senior leaders are keen to address that. For example, the Jisc digital experience insights survey 2019 found that only **34% of university teaching staff have regular opportunities to develop their digital skills**[48], often through the development of robust, continuous and on-demand training opportunities such as e-learning platforms. The strength of the learning and development opportunities on offer can also play a significant role in attracting new talent.

> *"We've now gone out to recruitment for the third time for someone who can manage a SQL Server environment. It has been a challenge to find someone with the right skillset, but this seems to be the case for many digital roles. I think we need to really focus on developing and 'growing our own' people, and perhaps bring more young people through the apprenticeship scheme"*
>
> Rob Blagden, director of libraries, technology and information at the University of Gloucestershire

Embedding a collaborative culture and agile ways of working – universities want to embed agility and collaboration within their culture and working methods. Senior leaders are working on breaking down organisational silos, for example by expanding co-working spaces and using more online collaboration tools. They're also developing better ways to communicate university strategy to staff, so it's easier to align objectives and improve strategic thinking at all levels.

Improving signposting for academics and staff – often, university staff find it hard to navigate around the institution's complex systems, services and resources. Managers are responding with a range of solutions including intranet optimisation and staff-facing chatbots. Some are also establishing

47 universitiesuk.ac.uk/facts-and-stats/data-and-analysis/Documents/higher-education-facts-and-figures-2019.pdf
48 jisc.ac.uk/reports/digital-experience-insights-survey-2019-staff-uk

clearer roles and responsibilities for their staff to avoid duplicated work, provide adequate support and help people to identify the relevant points of contact for different support services.

Automating time-intensive tasks – staff and academics at university often have large workloads and experience large peaks, for example during end of year assessments. In the case of high volume, repetitive and rules-based tasks like assessment marking, automation can play a pivotal role in increasing both efficiency and accuracy. Some universities are now using automation to reduce staff workload, reduce costs and improve student and staff experience.

> *"Over the lifetime of a piece of curriculum, assessment marking and feedback is the single most resource intensive task and has the most significant impact on student success. Automation of some aspects of assignment handling can play a significant role in freeing up staff time from more administrative aspects of the task to focus on students"*
>
> Rebecca Galley, director of learning experience and technology at the Open University

Barriers

Universities have identified a number of obstacles that they'll need to address:

Time constraints – in a very time-constrained environment it's hard for people to take up learning and development opportunities. Very heavy workloads can also affect staff retention.

> *"The real problem which HE has is that, to quote one of my old bosses, 'we're trying to change the engine of the car while doing 80 miles an hour down the fast lane'. That is the biggest problem, as staff may find it difficult to manage change because they're up against it trying to keep their head above water with what they're currently doing"*
>
> Andy Beggan, dean of digital education at the University of Lincoln

Significant diversity and complexity in contract structures – university employment contracts are complex and varied. This makes it hard to deliver this priority and provide consistent benefits for all members of staff.

Ongoing controversies about pay and pensions – in recent years, universities have faced many issues about remuneration, especially vice-chancellor pay and rising pension contributions. These trends have often created divides between leadership and staff that need to be resolved.

Practical advice for startups

When talking to university senior leaders about recruiting, retaining and developing world-class staff, startups should remember:

Observation	Implication
Staff are time poor and this prevents them from adopting new technologies and other changes on campus.	Startups can overcome this barrier by offering evidence of the impact their solutions will have, automating time-intensive tasks and integrating their solutions as part of existing workflows where possible.
Lack of digital literacy and resistance to change hinder adoption of new and innovative technology solutions.	Developing simple and intuitive user interfaces, and providing training if it's needed, can make it easier to adopt startup solutions.
As universities get bigger and more complex it gets harder for staff to navigate a way through the organisation.	Successful startup solutions will feature clear signposting so staff can identify the systems, services and resources they need.
University senior leaders want to develop more collaborative, agile teams.	Startups can support this ambition by providing online tools that enable sharing of best practice and more real-time interactions between staff.

Next steps and getting involved

We want to turn the findings in this report into action. The next phase of our research focuses on identifying edtech startups that can help universities succeed as they pursue these five priorities.

The next publication will focus on two student-centric priorities:

1. **Delivering the best and most equitable student experience**

2. **Adapting to evolving student expectations for employability and career outcomes**

Over the coming weeks, we will be working with universities who are pursuing innovative solutions in this space and talking to startups who have created (or are developing) the game-changing offerings they'll need.

If you would like to know more about how we support universities and startups to collaborate on digital solutions for these priorities, please do get in touch at **edtech@jisc.ac.uk**

You can also join our ecosystem of universities and startups by taking part in our **step up programme**.

About step up

Our programme for helping institutions and edtech startups work together with confidence.

Working together, Jisc and Emerge Education have developed step up. It's a healthcheck for startups to help universities engage confidently with startups, knowing that some due diligence has been carried out and that the startup's solution is procurement ready. For startups who meet the criteria, step up offers a range of benefits including:

- **Speeding up procurement processes** with a simple healthcheck assessment

- **Improving visibility to decision-makers** with an 'assessed by Jisc' badge and comprehensive report

- **Providing relationship building opportunities with senior leaders** in the sector through exclusive networking events

Find out more:
jisc.ac.uk/rd/get-involved/step-up-programme

Acknowledgements

Alex Butler, chief digital and information officer at the University of Bath

Stephen Dudderidge, registrar and secretary at the University of Brighton

Rebecca Lingwood, provost at Brunel University London

Mariann Rand-Weaver, vice-provost at Brunel University London

Julie Mercer, partner at Cairneagle Associates

Ian Dunn, provost at Coventry University

Paul Fairburn, director of enterprise and innovation at Coventry University

Andrew Turner, associate PVC (teaching and learning) at Coventry University

Jackie Labbe, PVC (academic) at De Montfort University

Alasdair Blair, associate PVC (academic) at De Montfort University

Suzi Jarvis, founding director of the Innovation Academy at University College Dublin

Jan Lynn-Matern, CEO and founder partner at Emerge Education

Nic Newman, partner at Emerge Education

Tim Quine, DVC (education) at the University of Exeter

Ian Blenkharn, director of education and student experience at the University of Exeter

Anne Carlisle, vice-chancellor and chief executive at Falmouth University

Robin Kirby, strategic advisor to the vice-chancellor at Falmouth University

Simon Nelson, CEO at FutureLearn

Rob Blagden, director of libraries, technology and information at the University of Gloucestershire

Mike Russell, ex-chief information officer at Imperial College London

Gideon Shimshon, director of digital learning and innovation at Imperial College London

Andrew McGregor, deputy chief innovation officer at Jisc

Paul Bailey, programme manager at Jisc

Helen O'Sullivan, PVC (education) at Keele University

John Harris, director of education and student solutions at King's College London

James Toner, head of digital education and the centre for technology enhanced learning at King's College London

Dave Hall, chief operating officer at the University of Leicester

Andy Beggan, dean of digital education at the University of Lincoln

Gavin Brown, PVC (education) at the University of Liverpool

Simeon Yates, associate PVC (research environment and postgraduate research) at the University of Liverpool

Chris Cobb, PVC and chief operating officer at the University of London

Mark Anderson, chair at London Metropolitan University

Richard Taylor, chief operating officer at Loughborough University

Helen Laville, PVC (education) at Manchester Metropolitan University

Emily McIntosh, director of learning, teaching and student experience at Middlesex University

Nick Petford, vice-chancellor at the University of Northampton

Alejandro Armellini, dean of learning and teaching at the University of Northampton

Paul Greatrix, registrar at the University of Nottingham

Guy Mallison, director of business development at Nottingham Trent University

Alex Acland, partner and head of education practice at Odgers Berndtson

Rebecca Galley, director of learning experience and technology at the Open University

Wyn Morgan, vice-president for education at the University of Sheffield

Paul Le Blanc, president at Southern New Hampshire University

Liz Barnes, vice-chancellor at Staffordshire University

Nuala Devlin, dean of student services at Staffordshire University

Max Lu, vice-chancellor at the University of Surrey

Patrick Hayes, chief development officer at Times Higher Education

Anthony Smith, vice-provost (education and student affairs) at University College London

Amber Thomas, head of academic technology and digital transformation at the University of Warwick

Mary Curnock Cook, ex-CEO of UCAS

Heidi Fraser-Krauss, deputy registrar and director of corporate and information services at the University of York

Glossary

Access and participation plans (OfS): access and participation plans set out how higher education providers plan to improve equality of opportunity for under-represented groups to access, succeed in and progress from higher education. The OfS monitors access and participation plans to make sure education providers honour the commitments they make in the plans and take action if they don't.

Digital experience insights survey (Jisc): a study that institutions can carry out annually to get an accurate picture of how their students and staff are experiencing their digital environment. The findings can inform decisions about how universities and colleges should plan and invest in improvements that will enhance the student experience.

Foundation degree: equivalent to two-thirds of an honours bachelor's degree, FDs combine academic and vocational learning. Widely offered in England, Wales and Northern Ireland, foundation degrees are now increasingly being offered by Scottish institutions too.

Gartner Pace-layered Application Strategy: a methodology for categorising, selecting, managing and governing applications to support business change, differentiation and innovation.

Graduate Outcomes: a survey to capture the perspectives and current status of graduates. All graduates who completed a higher education course in the UK are asked to take part in the survey 15 months after they finish their studies. It gives current and future students insights into career destinations and development, helps universities and colleges evaluate and promote themselves and helps the government and other interested organisations to understand the higher education sector and the graduate labour market.

Government Review of Post-18 Education and Funding: launched by the UK government in response to growing concerns about the cost and value of higher education, the review's purpose is to create a system of post-18 education that is effective and offers value for money for students and taxpayers.

HESA: works with providers of HE in England, Scotland, Wales and Northern Ireland to collect, assure and share data about HE, and to support and improve competitive strength in the sector.

Higher Technical Qualifications: level 4 and level 5 qualifications (those between A-levels and bachelor's degrees) have been rebranded by the UK government as Higher Technical Qualifications and are being quality assured to boost the perceived value of the vocational and technical qualifications that employers are looking for, and encourage students to choose to study them.

Institute of Coding (IoC): funded by the Department for Education (DfE) via the OfS, the IoC is a collaboration between 33 universities and 100 employers in England and Wales to give learners the digital skills that will help them get jobs in digital sectors. It offers a range of courses that learners (including members of the workforce who need to upskill and people who want to get back into work) can study flexibly.

Institute for Fiscal Studies (IFS): a leading independent research institute analysing public policy in areas such as tax, benefits, education policy and labour supply.

Institutes of Technology (IoT): collaborations between further education (FE, HE and employers, IoTs will provide technical education in STEM subjects. The government announced the first 12 IoTs, all in England, in April 2019.

Learning analytics: learning analytics helps education organisations to use the data they collect about students to tackle big strategic issues like improving student experience, retention, wellbeing and attainment, and to make business processes more efficient.

Longitudinal Education Outcomes (LEO): LEO uses matched data from education, tax and benefits records to understand how much graduates from UK universities are earning one, three and five years after graduation.

National Student Survey (NSS): an annual opportunity for students to comment anonymously on what they think about their course. The results are published and used by prospective students to help them choose where and what to study, and by universities and their students' unions to improve the student experience.

Organisation for Economic Co-operation and Development (OECD): a body representing 36 member countries and aiming to stimulate economic development and world trade.

Office for Students (OfS): set up by the DfE to regulate higher education, making sure that prospective students have quality information to help them choose the right course and provider, and to ensure that all students have a fulfilling experience in HE and can achieve good outcomes.

OU Business Barometer: an annual survey of nearly 1,000 business leaders monitoring the skills landscape and looking at how businesses are responding to skills shortages. It focuses on recruitment, salaries, training and temporary staffing.

Research Excellence Framework (REF): the system used by the UK's four HE funding bodies to assess the quality of publicly-funded research and provide evidence of its value, to provide benchmarking information and inform how research funds are allocated.

Transnational education (TNE): education that is provided by an institution in one country to students in another, through distance learning, local delivery partnerships or facilities set up by the institution in the students' own country – or a combination of these.

Teaching Excellence and Student Outcomes Framework (TEF): assesses excellence in teaching in England's universities and colleges and looks at how well they ensure good outcomes for students. The TEF is managed by the OfS.

UK Research and Innovation (UKRI): works in partnership with universities, research organisations, businesses, charities, and government, aiming to create an environment for research and innovation to flourish in the UK.

Universities UK (UUK): the collective voice of 136 universities in each of the UK's four nations. UUK's members are vice-chancellors and university principals and the organisation helps its members to maintain the HE sector's strength and supports them to achieve their aims and objectives.

Methodology

We developed this report with a focus on primary research by conducting interviews with 50+ key decision-makers across the sector. This group comprised university senior leaders including vice-chancellors, PVCs, CIOs and COOs, as well as HE sector experts. We have supplemented and contextualised the findings from these interviews through detailed secondary research, including a thorough review of existing literature.

Author and editorial team

Mario Barosevcic, principal at Emerge Education
Shinaz Navas, associate at Emerge Education, author
Sue Attewell, head of edtech, Jisc

About Jisc

Jisc is a not-for-profit providing the UK's national research and education network (NREN) Janet, and technology solutions for its members – colleges, universities and research organisations. It is funded by the UK higher and further education and research funding bodies and member institutions

Email: **info@jisc.ac.uk**
Website: **jisc.ac.uk**

About Emerge

Emerge Education is a European seed fund investing in exceptional 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 founders/investors of Trilogy and 2u. The team has a solid track record with 50+ investments, with those companies raising £100m+ from investors such as Local Globe, Stride, Project A, Rethink Education, Learn Capital and Reach Capital. Emerge also convenes Edge, a series of thought leadership forums for higher education and corporate leaders working on addressing the skills gap in their organisations and beyond. Through Edge, Emerge is able to help founders gain unique customer insights and build defining business partnerships that help their companies grow faster.

Email: **info@emerge.education**
Website: **emerge.education**

Jisc
4 Portwall Lane,
Bristol BS1 6NB
0300 300 2212

info@jisc.ac.uk
jisc.ac.uk
@Jisc

emerge education

Jisc

Assessment rebooted

From 2020's quick fixes to future transformation

From fixes to foresight: Jisc and Emerge Education insights for universities and startups

Report 2

janison

From fixes to foresight: Jisc and Emerge Education insights for universities and startups

At Jisc and Emerge Education, we believe that education technology (edtech) has rich potential to help UK universities solve their biggest challenges. We see edtech startups as key to the innovation and agility that higher education needs to navigate the rapidly changing present and future. This is a critical part of building a sector that is resilient to unforeseen changes and that can further transform using advanced technologies, as part of our vision for an Education 4.0.

We have worked as close partners for several years and our collaboration brings together Jisc's 30+ years of experience in providing digital solutions for UK education and research, and Emerge's in-depth knowledge of the edtech ecosystem based on investments in 55 startups in five years. Together, we've developed unique insights into the potential of edtech in higher education.

To unlock that potential, we're undertaking a programme of research. It's focused on exploring the most urgent priorities that university senior leaders will face over the next three years, which we investigated and set out in our initial joint report, The start of something big? Can edtech startups solve the biggest challenges faced by UK universities?

Priority one
Delivering the best, most equitable student experience.

Priority two
Adapting to student evolving expectations about employability and career outcomes.

Priority three
Expanding the university's reach by attracting more (and more diverse) students.

Priority four
Transforming digital and physical infrastructure.

Priority five
Recruiting, retaining and developing world-class staff.

Each report in this series explores aspects of each priority in more detail, mapping current approaches and challenges, and highlighting specific edtech solutions and startups. The reports draw on the expertise of leaders from HE, employers and startups, through Jisc – Emerge Education advisory groups on specific topics, including the future of assessment, the employability journey of students from non-traditional backgrounds, student recruitment in challenging times, employer-university collaboration and the student mental health and wellbeing challenge.

We find that there are plenty of opportunities for startups to hear from each other but very few for them to hear from real customers – universities – and understand in depth the priorities they have and the problems they are facing. This report series does that, providing startups with the information they need to shape their products so as to ensure they meet university needs. For universities, the series offers insights into how the sector is managing change as well the possibilities for the future.

The work on the reports was well underway when the COVID-19 pandemic hit, and we have seen the university sector adapt more rapidly than many thought possible to the challenges of digital delivery. But in the midst of crisis, it is important to draw a clear line between our immediate response and what it tells us about the future. The reports in this series seek to look across the immediate and long-term time horizons to give readers a map and compass out of the current situation and towards the future of higher education.

Ultimately, we want to build a vibrant, highly effective edtech ecosystem, with seamless collaboration between universities and leading startups, to ensure students get the educational experience they deserve.

Paul Feldman
CEO, Jisc

Nic Newman
Partner,
Emerge Education

CONTENTS

Foreword

The Jisc – Emerge Education advisory group on assessment that I had the privilege to chair originally set itself an ambitious ten-year horizon to imagine a world where digital assessment had become normal. Little did we think that digital assessment would become a necessity so soon. The spread of the COVID-19 virus has had a profound effect on so many different aspects of our lives and work. In higher education, the impact on assessment was swift and profound. Consequently, as well as considering the future, our report now also addresses the here and now and includes case studies of emerging institutional approaches to manage the short term as well as drawing on the QAA's useful checklist of reflective questions on moving to online assessment.

The science fiction author William Gibson is often attributed with saying "The future is already here — it's just not very evenly distributed". Apocryphal or not, this observation certainly resonated with our panel of experts. Over a period of six months we heard evidence from a wide range of stakeholders on changes that are already taking place. Changes that will become the new normal in ten years' time. This report seeks to stimulate thought and debate and to prepare universities, policymakers and innovators for the opportunities that technology will bring to assessment of learning outcomes and skills.

Digital assessment is a golf-size umbrella term used to describe a range of activities, from scanning and workflow of exam scripts through to use of simulation, virtual reality and artificial intelligence in the grading process. This report considers how these innovations can provide opportunities to innovate the types and modes of assessment in the context of changing expectations from learners, assessors, providers and employers, to name but a few.

Some of the ideas which emerged were astounding. For example, group assessment where only one person in the group is human and the others are bots matched to have complementary personality traits. Others were equally transformative but more immediately achievable and responded to immediate growing expectations and needs. For example: keyboards replacing pens, multiple cohorts and assessment points, improved plagiarism detection and fraud prevention.

We considered how digital assessment could provide employers with a better understanding of an individual's abilities such as collaborating at distance and providing peer feedback. Similarly, how retina tracking and virtual reality simulation offer new approaches to grading practical skills or assessing fitness to practice.

The group also considered the risks of change such as loss of learner/public confidence in the system, machine bias and increased identity/qualification fraud. In so doing, we took a balanced view, recognising that the current system is not perfect and that digital assessment must therefore be as good as (if not better than) current approaches but that waiting for it to be 100% foolproof is unrealistic.

The report is guided by the UK Quality Code from the Quality Assurance Agency for Higher Education (QAA) and includes three themes to describe the expectations of high quality digital assessment in 2030: relevance, adaptability and trustworthiness. Digital assessment must be relevant and contemporary to today's needs, it must be flexible to cope with specific circumstances (both personal and institutional) and it must, above all else, retain the confidence of stakeholders.

I'd like to thank my colleagues on the panel and the team at Emerge Education, Jisc and the QAA who contributed their time and expertise to this report and I hope that the reader finds our findings thought provoking.

Chris Cobb
Pro-vice-chancellor and deputy chief executive, University of London

Foreword

The higher education sector has adapted rapidly to new practices across its entire operations, from learning and teaching to partnerships, validation, student support and facilities.

As for assessment, its very nature is now changing and at a pace. As the sector adapts, the integrity of assessment needs to be at the front of everyone's minds.

Confidence in assessment processes is a cornerstone of the UK higher education sector's reputation. Higher education institutions have, in a very short time frame, had to adapt their assessment practices to fit online delivery. In doing so, they have needed to ensure that the assessment arrangements are robust, guarding against academic misconduct while also ensuring the fair treatment of students who have had to submit their work in challenging circumstances. How do institutions ensure that remote assessment is secure, verify the identity of candidates for assessment and ensure that they are not making illicit use of reference materials?

While universities compete on many levels, collaboration on standards is key to the global reputation of UK higher education. This report is an example of the value of such collaboration and offers useful insights into current practice, future visions and how edtech startups might work in partnership with universities to help make assessment even more relevant, adaptable and trustworthy. I am delighted that this report includes the QAA's series of reflective questions that universities can use to evaluate their move to online assessment and that will help startups understand the challenges facing universities in this space.

Douglas Blackstock
Chief executive
The Quality Assurance Agency for Higher Education (QAA)

Summary

Evaluating and measuring learning outcomes is fundamental to all education systems.

Unlike primary and secondary education, universities are able to define their own approaches to assessment, with each university free to innovate as suits its circumstances and mission. Over recent years, universities had been considering the potential presented by emerging technologies – opportunities for new approaches to assessment coupled with improvements in efficiency and cost for institutions, and effectiveness for students and teachers.

However, while there were pockets of best practice, the overall pace of change was slow. So in early February 2020, the Jisc report 'The Future of Assessment, Five Principles, Five Targets for 2025' set out to address this. The report suggests that, by 2025, digital technology will make possible assessment that meets five key goals: more authentic, more accessible, appropriately automated, more continuous and more secure. It laid out five targets to be achieved in five years in the development of digital assessment.

But meanwhile, the predominant mode of summative assessment continued to be pen and paper – until March 2020.

The impact of COVID-19, and its resultant lockdowns, on established assessment processes and events has been severe. Universities' responses, as they scramble to maintain the viability of this academic year's assessments, have varied greatly.

We have identified five distinct types of response that we illustrate with short case studies involving seven universities. These approaches, and the challenges universities face in coming up with rapid and scalable 'fixes' in an emergency situation, reveal some of the tradeoffs institutions are having to make and the gaps in the current system.

As they – possibly – catch their breaths after this set of exams, universities are now looking at where they go from here. There will not, indeed cannot, be a return to things just as they were. There is the question of how to plan for an unknowable 2020-21.

Beyond that, what vision might we have for a future that offers not a quick fix but a managed transformation to a well designed assessment system fit for the world that today's school students are heading towards?

For that vision, we look ahead to 2030, to a goal of digital assessment that is relevant, adaptable and trustworthy, and we imagine what the components of that assessment might look like.

And then we ask, how do we move from here to there? What can we learn from the experiences of this spring and summer? What does higher education need in order to get us there? What do we do next?

Introduction

In March 2020, as the impact of COVID-19 and the lockdown measures put in place to contain it became clear, universities confronted a stark challenge: how do you transform long-established assessment processes, at speed and at scale? Hundreds of thousands of students at UK universities who were expecting, in a matter of weeks, to sit in ranks in exam halls, completing the pen-and-paper exams that would decide their final grades after three or more years of study, faced an uncertain future. Within universities, academic and professional staff raced to work out what was possible, what was desirable and what was fair.

Universities took a variety of different approaches based on their current context, their goals for the immediate period, institutional values and, for some, their longer-term digital assessment trajectory. Every approach involved trade offs. Do you place a higher value on trustworthiness and possibly risk equity? Or focus on adaptability / flexibility and accept that the trustworthiness of the assessment may be less rigorous? Does the benefit to students' future careers of completing full exams now, despite the unprecedented circumstances, outweigh the potential immediate effects on mental health?

Based on interviews with a number of institutions, we can identify five distinct approaches to summative assessment in this emergency period: trailblazing, innovative, radical, flexible and incremental. While each of these approaches is illustrated here with a short case study reflecting the characteristics and experience of the university under the lens, many institutions will find that their own approach fits broadly into one of these categories.

The range of challenges highlighted by these approaches offer an insight into the issues that need to be tackled in the medium term and the opportunities they present for digital assessment.

Five fixes

1 Trailblazing:
Radical change to assessment at speed and at scale

Example: University of London, using Moodle, Turnitin and Janison

What was done?

The University of London (UoL) took 40,000 students sitting around 500 exams in 160 countries from solely paper-based, face-to-face, pen and paper to digital testing in one move, which included digitally proctored exams.

"What we were expecting to do maybe two or three years down the road we're going to try and do this summer. We're making an enormous step change in our assessment piece at this moment. In the UK, I don't think anyone else is trying to do this."

Craig O'Callaghan, UoL worldwide director of operations and deputy chief executive

How was it done?

In mid-2019, UoL started a major project reviewing the whole of the digital landscape for assessment, looking at platforms and players and intending to implement one or two pilot projects with smaller programmes the following year.

That all changed very quickly. Within 24 hours of the lockdown announcement, UoL had set up a task force bringing together colleagues from across the university, including specialists in IT, data protection, digital systems, course development, pedagogy, assessment and Moodle, to assess all the options rapidly, based on O'Callaghan's pledge that *"I wanted every single one of our 40,000 students to be able to be assessed this summer."*

The result was three assessment routes for UoL students:

- Online, open-book exams with a paper to be downloaded and returned within a prescribed time – from four hours to a few days – via Turnitin. Predominantly for postgraduate programmes.
- Online exams via Moodle and Turnitin, for most undergraduate programmes.
- Digitally proctored exams for about 10,000 students using the Janison platform and UoL's UK implementation partner, CoSector.

UoL extended the exam timetable in order to run large-scale tests for students and enable them to practise downloading question papers, uploading them back through Turnitin and into Moodle and, in the case of students doing digitally proctored exams, getting used to facial recognition and uploading identity documents.

Why was it done this way?

An institutional imperative to assess all students was matched by the demands of professional, statutory and regulatory bodies (PSRBs) in the case of some courses, such as law, as well as the requirements of those programmes that have little or no coursework. In addition, there was pressure from students concerned to graduate and move on to their careers.

2 Innovative:
Building on an innovation base and scaling it up

Examples: Brunel University, using WISEflow, and Newcastle University, using Turnitin and Blackboard

What was done?

Brunel was already ahead of the pack in its use of bring-your-own-device digital exams. In the last academic year, 2018-19, more than 2,700 students – about 20% – experienced one or more bring-your-own-device exams.

"We were probably as well placed as we could be."

Mariann Rand-Weaver, vice-provost (education)

Brunel is using WISEflow from UNIwise for digital exams and all course work assignments. Now in its third year of rollout, the platform is familiar to all students and staff and there is a well-established laptop loan scheme to ensure all students have access to the technology they need for exams.

"We have worked as a partner with UNIwise, which is the provider of WISEflow, and that has really helped. It's not as though you go out and buy a piece of software, or access to a piece of software, and then you are left on your own. It's been useful to connect with other institutions who are using the same product and who have got different experiences, and that has been really, really helpful."

Mariann Rand-Weaver, vice-provost (education)

How was it done?

Brunel moved to open-book, take-home exams, without locked-down devices or remote proctoring, mostly sat in a strictly exam-length timeframe (ie a two-hour exam or three-hour exam), with reviewed and revised questions to make the assessment suitable for the format. Some academics took the opportunity to change the type of assessments they were asking students to do, such as setting longer pieces of work completed over six hours, requiring research and demonstration of abilities beyond what would have been possible in a time-limited, invigilated exam environment.

"Having the WISEflow platform means we could effectively change the assessments and let students submit their answers to a platform that was already being used by staff and students. I would be surprised if we don't find that we've got to a place where we wanted to get to much quicker as a result."

Mariann Rand-Weaver, vice-provost (education)

Why was it done this way?

Although Brunel had previous experience of holding remote exams in controlled, locked down and invigilated conditions, such as when holding digital exams for students abroad, the option of running fully locked down, remote

exams wholescale was rejected as too risky, given the speed with which remote exams had to be implemented. Students' devices might not be up to date enough to run the software, they could not be checked by IT services, as they are before BYOD exams, and there might be issues around network connectivity in students' homes.

Newcastle University, which also came from a strong starting position and last year did about 170 online exams, took a similar approach to the trade off between the security of digital proctoring and the risk of students not having access to the necessary technology, connectivity or even a peaceful space in which to sit an exam of that type.

"We felt that doing a two-hour exam in the same way we would have done if we had been on campus was going to cause a lot of stress for our students."

Graeme Redshaw-Boxwell, learning enhancement and technology team manager

Newcastle moved to two options: changing the exam into a piece of coursework or providing a 24-hour take-home exam that could be submitted through Turnitin or taken as a test via Blackboard.

3 Radical:
Minimising stress in the student experience

Example: Open University

What was done?

The Open University (OU) had long been ahead of the curve with digital assessment, pioneering an in-house system for electronic upload and marking of assessments around 10 years ago. Over the last 18 months, it had reviewed more up-to-date systems and procured WISEflow.

The OU assessment model is comprised of both continuous, tutor-marked assessment (TMAs) and summative end-of-module assessment in the form of a final, untimed written assessment (EMA) or exam. The OU decided to take a light-touch approach to summative assessment in this crisis period.

Of the more than 300,000 assignments scheduled between April and June, only those that were essential, due to regulatory reasons or the weighting of the course towards a final assessment, were to go ahead. The rest would be cancelled and grades assigned based on continuous TMA results, though

students could request postponement to a later date.

"We really wanted to, where possible, do away with end of module assignments because our students probably face a different reality from the average undergraduate student in a traditional university."

Klaus-Dieter Rossade, director of assessment programme, OU

How was it done?

The OU had generally moved away from final exams in recent years, with fewer than a third of modules requiring them, making this year's switch easier. An emergency management team, chaired by the deputy vice-chancellor and with input from all stakeholders, including students, was tasked with making decisions quickly and communicating them.

"The question might be, do we still need an exam going forward? Some may be required by regulators but the argument to really question whether you need one will be ever greater."

Klaus-Dieter Rossade, director of assessment programme, OU

Why was it done this way?

The OU has a large number of students declaring a disability, of which many declare anxiety and mental health issues. The sudden introduction of significant changes to assessment, such as digital proctoring requirements, could have had a particular impact on those students. Many OU students are also key workers or were dealing with childcare or other caring responsibilities. A key premise of the approach was to reduce student stress at a time of already heightened anxiety. In addition, the OU is thinking radically about assessment more generally:

"I would like to see digital methods fully utilised to make assessment more authentic and a more compassionate experience for students. I am concerned that tech developments are tending to focus on capabilities such as digital proctoring to enable us to deliver exams more cheaply and easily, and yet examination is not necessarily the most valid and reliable way to assess a lot of different disciplines, and represent a huge barrier for many students. I would hope that digital assessment will enable us to assess workplace competencies, digital skills and applied academic skills much more effectively than we're able to do at the moment. And also to offer more opportunities for peer and collaborative assessment in a way that feels comfortable and meaningful for students."

Rebecca Galley, director of learning experience and technology

4 Innovative flexible:
Maximising fairness and flexibility

Example: Arts University Bournemouth (AUB), using WISEflow

What was done?

As a specialist arts university with the majority of student work taking the form of both physical and digital outputs, AUB faced different challenges with digital assessment to many institutions. Using WISEflow, AUB took a 'maximum fairness and maximum flexibility' approach during the lockdown period, with 95% of assessment submissions being digital. AUB ensured that support staff were available to help students, and staff, navigate the process of uploading work to WISEflow and the ability to assess from that platform.

"A priority – and a strength of AUB – has been our agility, our fleet-footedness because of the size of the courses, and our strong sense of academic identity and belonging, which gave us an ability to respond quickly."

Paul Gough, principal and vice-chancellor

How was it done?

AUB entered the period with two advantages: it had been working with WISEflow for more than three years, so final year students were very familiar with online submission, and much of the physical making and workshop activity had already been completed thanks to AUB's 12 / 12 / 6 academic year.

Where physical work needed to be submitted, AUB was careful to ensure that the assessment was not compromised by the move online and students were not disadvantaged by the lack of access to the industry-standard equipment available at the university, even though specific leading-edge technology is a consistent feature of AUB resources. In some cases, low-tech approaches were encouraged – such as a print-ready image rather than a final print for photography courses – with an emphasis on AUB's fundamental teaching-learning principle: the process of making, the modes and methods of enquiry, the contexts for the production and other methodological learning outcomes are assessed rather than merely the finished, polished piece of work.

Finally, AUB pledged to honour students' needs to have a physical performance or show by offering the opportunity to return to the university and finish any uncompleted work after graduation and lockdown.

"We pride ourselves on our employability status. So we want to help our students continue to get jobs in what will be an incredibly difficult economic and employment market. We're really conscious that it is not only their assessments and classifications that count but how good their portfolio is that helps them get employment."

Emma Hunt, deputy vice-chancellor

Why was it done this way?

"Globally, arts education will tend to focus assessment on the final 'product' – the film, dance piece, the artefact, the exhibition etc. While that is important as 'output' we have done a huge amount of work with our students to re-emphasise that it is the process of inquiry, the learning outcomes through the inquiry itself, that is important rather than simply presenting a final exhibition-quality output. Yes, we know that is important but so is the process, the route map and the methodology, as well as the contexts and critical thinking that have informed the creative making."

Paul Gough, principal and vice-chancellor

As well as taking the opportunity to emphasise the importance of process in the arts, AUB also declares a 'moral obligation' to help creative practitioners finalise those pieces of work and to get the best portfolio they can to take into their working lives.

5 Incremental:
Adapting and extending familiar tools

Examples: Coventry University using Moodle, Aula and Manchester Metropolitan University, using Moodle

What was done?

Coventry had been exploring innovative assessment with a view to moving to fully digital assessment with its Curriculum 2025 strategy; the majority of its written assessments were already digital, with about 24,000 digital submissions each week, and it had reduced its loading of final exams by 50% in the last two years. It also already provided fully online courses on the FutureLearn platform. However, Coventry had not yet experimented with digital unseen exams, was in the process of setting up trials with online assessment platforms Inspera and UNIwise and chose not to not rush a major strategic decision.

How was it done?

"There's a need to start to look at digitisation of the exam process and delivery to modernise the process. I think it's ridiculous that we've still got students handwriting exams in this day and age. But in the UK I think there's a bit of a gap in HE for software and for products that support that process."

Andrew Turner, associate pro-vice-chancellor, teaching and learning

Coventry reworked all its scheduled, face-to-face, written exams as replacement assessments – preferably coursework but, if not possible, then an open-book timed assessment with a completion time of 16 hours (and where professional body requirements called for tighter timing, to be completed in a four-hour time slot, within that 16-hour window).

As part of its no detriment policy Coventry enhanced its moderation process, looking not only at individual student performance but also at whether the cohort performance was significantly reduced or significantly over what would be expected in comparison with previous cohorts.

Why was it done this way?

"We've been very much of an opinion that it's better to continue and enable students to complete their assessments and progress."

Andrew Turner, associate pro-vice-chancellor teaching and learning

Manchester Metropolitan University took a similar approach, converting the majority of its 400 exams into a take-home paper released at a set time via Moodle and run in a short time frame.

"We've asked our academics to try to keep it simple and just to use tools that students are familiar with. Whereas students in the past two terms have already used the Moodle tools to submit coursework, now that effectively they're submitting their exams in the same way. Again, they're familiar with those tools, how they work, so hopefully that minimises the impact on our students."

Simon Howells, business analyst, Manchester Metropolitan University

Challenges

These emergency quick fixes needed to respond to a range of challenges and trade-offs:

Scale

Scaling up to go beyond pilots and trials, meeting the need for digital assessment across an entire institution and a wide range of subjects in one fell swoop, was a major challenge in this period, adding a new level of complexity to the situation.

Pace

The pace at which universities had to react was intense and, in general, compelled them to stay with what they knew rather than risk introducing unfamiliar platforms or tools to staff and students at a time of uncertainty and anxiety.

Student access to technology

While locked-down and digitally proctored exams may be the most secure options, they also required technology and connectivity that not all students may be able to access in their own homes. This security/equity trade off is arguably the most common and pressing issue and lies at the heart of the current challenge in making assessment both more trustworthy and more adaptable.

Student expectations

The class of 2020 needed to feel the process was fair (no detriment policies) and recognised the circumstances under which they were being assessed.

There was also a trade off between mitigating student stress and balancing the wishes of those who wanted to feel their course had been completed rigorously, enabling them to move on to the next stage of their working or academic life. In addition, there were student concerns raised about privacy in relation to online proctoring.

"The challenge for us now, I think, is convincing the students that there is comparative and positive experience in their assessment when they're talking through what they have done, via Skype for Business, Zoom or whatever, as opposed to presenting it on a wall, in a theatre or in a screen setting."

Paul Gough, principal and vice-chancellor, AUB

Staff skills

In the Jisc digital experience insights survey 2019, only 34% of HE teaching staff said they were offered regular opportunities to develop their digital skills and only 13% were given time and support to innovate. This had clear implications for staff readiness to embrace new tools.

"We're asking staff at short notice to use things like Zoom or to use open-book assessments or transform things into coursework, and that does require skills and training to do that well, and maybe there hasn't been time to train staff in that."

Andy McGregor, director of edtech, Jisc

PSRB requirements

The recognition by professional, statutory and regulatory bodies of a range of higher education programmes is critical to the career paths of many students. The QAA has been convening conversations between PSRBs and universities to ensure that there can be variety, flexibility and innovation in the way students are taught and assessed, while still meeting the required professional standards.

"I think it'll be interesting to see how professional bodies respond, and how flexible they are and how open they are to changing the way that we assess. I'd like to think that professional bodies are a lot more open to time-limited assessments, more viva style, presentation style assessment, that sort of thing, and to move away from the traditional paper based exam."

Simon Howells, business analyst, Manchester Metropolitan University

Subject-specific issues

Certain subjects offer particular challenges for digital assessment. We have already seen how AUB overcame some of the difficulties around assessing visual and performing arts online. STEM subjects present their own challenges in digital assessment with regard to showing how a student has 'worked-out' a problem. Brunel's workaround involved allowing extra time in the take-home exams for STEM students to photograph and upload their working out.

"It's the challenge for technical and mathematical subjects and seems to apply to all the digital tools and platforms. Some of this would be absolutely doable if every student had a touchscreen where you could use a digital pen. But at the moment, while you can do some basic calculations in WISEflow, it is too cumbersome and would probably take somebody far too long to show workings out, calculations and so on with the current functionality."

Mariann Rand-Weaver, vice-provost (education), Brunel

INSIGHT FOR STARTUPS

"COVID has raised the stakes considerably and it is going to challenge the tech companies to improve. Universities are going to really push them very hard to improve their product sets. Once we've seen this major scale test this summer, we'll learn a lot."

Craig O'Callaghan, UoL director of operations and deputy chief executive

Introduction

The assessment quick fixes of spring 2020 have shown movement towards some of the targets of Jisc's 'The Future of Assessment, Five Principles, Five Targets for 2025' report far sooner than might have been expected.

What more might be possible if the challenges universities have faced could be resolved?

We've taken a longer-term perspective to imagine a world where higher education institutions implement innovative forms of digital assessment that positively serve the student experience; where teaching staff are empowered to take control of the assessment process; where student expectations go far beyond moving pen-and-paper exams online. It is a positive and pragmatic vision of the opportunities offered by the use of digital tools in higher education assessment.

Our view is that assessment in 2030 has to be relevant for the context of future decades rather than previous decades. Employers will wish to understand attainment in ways other than the ability to write long essays by hand or perform feats of memory recall. We believe technology will help assess an individual's ability, for example, to work in a team, solve complex problems, critique, innovate, challenge assertions or collaborate at distance. We believe in the capacity of our higher education system to innovate around assessment over the next decade in ways that meet those needs, inspire decision-makers to take steps towards making this future a reality; and provide practical recommendations on what institutions and technology providers could be doing today to maximise the benefits and address the potential risks of a fully digitised assessment system.

This section is structured around three key themes that we see as a set of minimum requirements for a well-designed digital assessment system in 2030. It must be:

Relevant

Enabling universities to go beyond traditional forms of assessment, dictated by practical limitations of analogue exams, and build systems that are relevant to contemporary needs and reflective of the learning process, and make use of innovative assessment methods too impractical to deliver without digital tools.

Adaptable

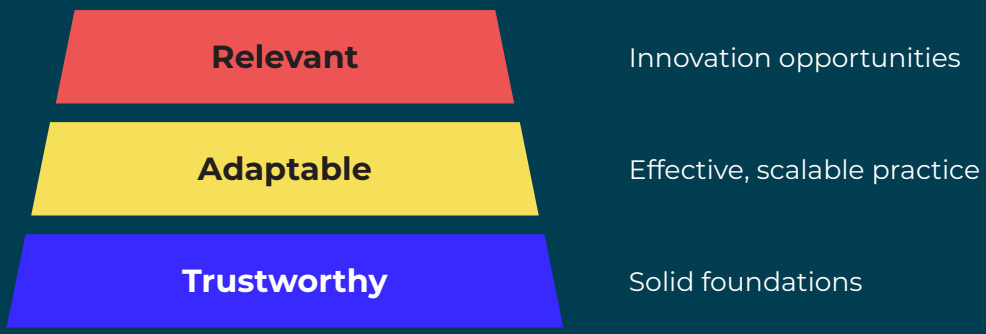
Effective in addressing the needs of a growing and diverse student population, a range of providers and any number of geographies.

Trustworthy

Based on solid foundations of academic integrity, security, privacy and fairness.

This can be visualised as a pyramid, highlighting at the top the ability that fully digital assessment will give us to accomplish things that may be seen as too risky or costly to pursue at present; taking into account the practical considerations of delivery so that the system can adapt to the scale and variety of higher education in 2030; and underpinned by fundamental principles of trustworthiness, reliability and validity.

Beyond Enhancement: Assessment in 2030



Digital assessment in 2030 must be... relevant

Traditional assessments, such as dissertations and exams, fall short when it comes to evaluating soft skills, are poorly aligned with the behaviour-based assessments increasingly used by employers, and impose structural constraints on developing creativity and divergent thinking. The shift to digital assessment will enable universities to re-imagine how and why students are assessed.

Relevant to their time and meeting the needs of students and employers

There is growing consensus that the value of higher education is not just in the knowledge imparted to students in lecture halls but in the skills and competencies they develop throughout their studies. As lifelong learning rises up the agenda of employers, education providers and policymakers, so does the importance of capturing whether students are building the foundations they will need to succeed in future life. Digital assessment will power the shift from memory recall to assessments that get to the heart of the new foundational skills of the 2030 economy: human skills as well as business-critical competencies.

How might this happen?

Virtual reality can be used to assess a junior doctor's communication skills not simply through what they say in responsew to a patient's question but also how: the time it takes them to respond, whether they are looking at the patient, their tone of voice and much more. Similarly, our group envisaged remote IT workplace simulations (similar to today's Slack workspaces) populated with a mix of student users and machine learning-powered bots playing out scenarios that uncover the students' ability to collaborate across teams in such an environment. Comparative judgment and peer grading, known today to be effective and accurate assessment methods, will become easier to implement at the scale of hundreds and thousands of students, improving the quality and depth of assessment for subjects in arts, humanities and social sciences.

INSIGHT FOR STARTUPS

Startups can help to plug the gap between universities and employers by using technology platforms to enable collaboration at scale (eg course co-creation, experiential learning projects).

[1] The New Foundational Skills of the Digital Economy

Digital assessment in 2030 must be... adaptable

The expansion of global access to higher education has been one of the great success stories of the past 70 years, unlocking a world of opportunity for billions of people around the world. At the same time, the growing scale of higher education will continue to create pressure on education providers' abilities to deliver a superior student experience that reflects student needs.

Universities also need to deliver a growing range of courses and modes: residential and distance learning, full undergraduate degrees and stackable micro-credentials, apprenticeships – as well as self-directed and lifelong learning for students of different ages, backgrounds and nationalities.

Student-centred and personalised

Currently, assessment tends to follow a 'one size fits all' model. The shift to digital tools will make it possible to redesign elements of assessment from first principles, meeting students where they are and adapting to their individual circumstances. By 2030, the benefits of automation and digitisation will extend beyond efficiency savings and produce tangible benefits for students, particularly those from traditionally underrepresented backgrounds.

How might this happen?

Assessment is a major source of stress to students, impacting their wellbeing and academic performance. A redesigned digital assessment system must be more compassionate. With advances in emotion detection and personalisation, digital assessment systems may also work to detect changes in a student's stress levels and adapt to them, for example by changing the order of questions or offering a break (especially in formative assessment). Digital assessment will also make it easier to allow practice and preparation on the student's own terms.

Anytime and anywhere

Unlike existing approaches, digital assessment is untethered to the physical infrastructure of exam halls and university buildings. While appropriate identity verification measures need to be taken, the pressure to concentrate all assessment activities within a very narrow timeframe and a particular location is significantly reduced.

This will make truly global universities more feasible, removing the requirement to attend exams in person, which restricts access to higher education to those who have the means to travel. This may lead to a re-evaluation of the role of university campuses and improved resilience, with universities less dependent on physical infrastructure that is liable to be disrupted by major global incidents such as pandemics, terrorist attacks or extreme climate events.

Efficient and manageable

By some estimates, global demand for higher education by 2030 will have

INSIGHT FOR STARTUPS

Startups can enable more seamless collaborations through shared databases, integrated systems (eg to deliver stackable credentials) and simple, intuitive user interfaces.

increased to between 350 and 500 million students, almost doubling current student numbers and vastly increasing the administration of assessment. Current approaches to assessment at scale often involve the digitisation of analogue exam papers, effectively replicating existing assessment practices with marginal savings in effort.

Fully digital assessment systems will allow large global institutions to mark millions of answers consistently, fairly and rapidly, providing substantial time savings and so freeing up resources for better student support, teaching and research.

At the same time, digital assessment systems must not be restricted to large-scale cohorts and must be adaptable to the needs of institutions or cohorts of all sizes and to different subject areas. Today, institutions such as Brunel University London, who are leading the way in adopting digital examinations, are seeing benefits in the reduction of effort required to mark individual papers as staff no longer have to struggle to read exam answers.

By 2030, the benefits of fully digital assessment will extend to greater personalisation of assessment questions as well as to widespread use of alternative forms of assessment that are more appropriate to each course and more relevant to the students' needs.

Digital assessment in 2030 must be... trustworthy

The shift to full digital assessment is a significant change for all stakeholders – HE providers, students, policymakers and regulators, as well as the wider public, including employers and parents. It is therefore imperative that innovation is accompanied by measures designed to support academic integrity and ethical behaviour within the system.

Academic integrity

Issues of academic integrity are a hot topic at the moment with a widespread sense of concern over plagiarism and the proliferation of essay mills. A range of existing digital solutions make use of large databases of student-submitted work as well as online search to detect cases of plagiarism, and advances are being made in the use of machine learning to discern a student's 'voice' and flag submissions inconsistent with previous pieces of work. By 2025, we may expect the technology to be in place, and widely adopted, that will allow universities to authenticate learners in consistent and robust ways. We must be mindful, however, of the barriers that such authentication may present to students and, in particular, the difficulties that students from disadvantaged backgrounds may experience in meeting automated requirements.

By 2030, we would expect these tools not only to become a standard and invisible part of the assessment toolkit but also see a shift to a more student-centric approach through co-design and the development of informal or formal codes of practice – improving trust in the system as a whole.

Data use and ownership

While there are significant questions around the ethical use of student-submitted data, members of our group felt that, in their experience, most students had a broadly positive attitude to the use of anti-fraud and identity verification tools. This extended to the use of digital tools for online proctoring, which enables students studying remotely to sit exams at the location of their choice.

By 2030, we expect regulation to catch up with the change in practices – as suggested by the Framework for the Quality Assurance of e-Assessment recently published as part of the

INSIGHT FOR STARTUPS

Startups that work in partnership with universities to co-create solutions are more likely to be able to demonstrate the real, tangible benefits that demonstrate what digital can offer and secure senior management buy-in.

INSIGHT FOR STARTUPS

Startups offering solutions that can collect, analyse and visualise student data and which also integrate with existing university systems will stand out.

EU TeSLA project,[1] which requires providers to implement fail-safe and accessible systems including learner authentication and anti-plagiarism technologies.

If large sections of the university sector move towards digital assessment, there may also be opportunities for aggregating assessment data across the system (for example, in an anonymised national database). Given existing concerns around 'grade inflation', this would provide opportunities to benchmark student performance across institutions and cohorts for a more comprehensive view of the real extent of this phenomenon.

The increased use of digital tools in assessment will lead to the collection of an ever-growing body of data on individual students. The current lack of clarity around the ownership and use of this data (such as student submissions to plagiarism detection tools) must be addressed by any well-designed digital assessment system if it is to earn the trust of students, educators and the wider public. Debates over ownership of data will also raise some intriguing questions for institutions, policymakers and technology providers to wrestle with – for example, does a 'right to be forgotten' exist when it comes to assessment?[2]

Fairness

The assessment systems we rely on today were, in large part, designed in an era when the student body was much more homogenous. There is growing realisation that these approaches are letting down today's students, whose backgrounds and circumstances vary so much more. The greater variety of assessment practices made possible by the use of digital tools could be a game-changer in closing the awarding gap for BAME students or in mitigating the negative impact of exams on students with disabilities, if the new systems are designed with inclusivity in mind.

[2] Framework for the Quality Assurance of e-Assessment (March 2019)

[3] Students or data subjects? What students think about university data security

Where does 2020's experience take us?

"I'm hoping that the current situation will have opened the Pandora's box in that more academics will see the advantages of using digital technology for assessment and use this as a stepping stone or as a building block for exploring what the possibilities are going forward."

Mariann Rand-Weaver, vice-provost (education), Brunel

How will the disruptive events of spring 2020 change the way universities approach assessment in the longer term and, perhaps, move the sector closer to the 2030 vision of assessment becoming more relevant, adaptable and trustworthy?

Firstly, it must be acknowledged that the 'fixes' explored in part one were emergency processes put in place at speed, under extreme pressure. As Graeme Redshaw-Boxwell, learning enhancement and technology team manager at Newcastle University, puts it, *"there's a difference between getting an assessment online and thinking about online learning, and in the current situation we were conscious the emphasis was more on the former than the latter"*.

Even under these circumstances, some universities managed to accelerate, or even turbocharge, planned digital assessment strategies; others put them on hold while dealing with the immediate crisis.

We can see the different tradeoffs shown in the case studies under the three themes outlined in the previous section:

More relevant and adaptable assessment

Despite the crisis requiring quick decisions, there were attempts to do more than simply replicate pen-and-paper assessment online in 2020 and a strong sense of excitement about the possibilities that were opening up. For the Open University, the improved technology now available to lock down browsers holds the possibility of transforming the work it does with prison education, while digital proctoring offers promise for those OU distance learners who require a more traditional yet adaptable exam process. However, ultimately, the OU is looking towards fundamentally more relevant assessment enabled by technology:

"Those assessment opportunities that are authentic and project-driven and enable students to engage with real-life databases and materials are a much more valuable assessment activity than the traditional multiple choice or essay. I'd really like to push down on that additional capability that digital exams offer, and not just think about replacing that exam-type experience."

Rebecca Galley, director of learning experience and technology, OU

Brunel is also exploring more relevant assessment, having already trialled some 'post-paper' exams, involving manipulating datasets, that rely entirely on technology and would not be possible without it.

"We have the ambition to use digital exams to assess in ways that are not possible with pen-and-paper exams, whereby we can perhaps set sophisticated tasks that challenge students to demonstrate what they can do and apply their knowledge with authentic tasks, rather than just regurgitating their knowledge. We believe this will really help students to demonstrate their skills and capabilities that they need for successful careers going forward."

Mariann Rand-Weaver, vice-provost (education), Brunel

If assessment is to exploit technology effectively and build systems that are relevant to contemporary needs and reflective of the learning process, and that address the evolving needs of a growing and varied student population, this period needs to lead to deeper-rooted questions about what is being assessed and how assessment is devised and developed, not simply how it is delivered.

"I think the current crisis will provide a lot of extra questions around where we've ended up transitioning to more take-home exams. We've been forced to do that, but actually, is that a better way to assess our students rather than having them in a traditional exam setting? Do we want to continue to assess our students in that traditional, closed-book environment? Is working from home a better way for our students to complete their assessment? All of those sorts of things perhaps we wouldn't have been thinking about as much before, I think are very much at the forefront now."

Simon Howells, business analyst, MMU

More trustworthy assessment

The University of London led the way with its introduction of digitally proctored exams at speed and at scale. The trade off between trust and equity was one of the knottiest that universities have faced and reveals clear opportunities for startups and universities to work in partnership with each other to co-create solutions.

"As a sector we need institutions to work together to innovate, to collaborate with both technology and software providers, and employers. Making sure that we are able to share good practice and have enough training opportunities and support for staff, so that we take them with us on this journey."

Mariann Rand-Weaver, vice-provost (education), Brunel

Assessments - market map

We have identified the leading startup players across four key dimensions: online assessments, proctoring, credentialing, and marking and feedback. These dimensions have been identified as the key areas where external providers can add the greatest value for universities. In the market map below, we have highlighted the standalone assessments tools that universities can procure, rather than the larger technology providers who also offer assessments modules as part of their wider ecosystem.

Online assessments

UNIwise

janison

Virti

inspera

Flipgrid

Sana Labs

écree

Marking and feedback

peergrade

GitHub Classroom

Proctoring

proctorio

Honorlock

proctorU

PROCTOREXAM
safe online exams

examity
BETTER TEST INTEGRITY.

Credentialing

Hyland

Credly

parchment

Checklist for universities

QAA has produced a series of reflective questions which education providers can use to evaluate and benchmark their move to online assessment:

1. All four Expectations of the UK Quality Code for Higher Education relate to assessment, directly or indirectly. Are any changes introduced compatible with the Quality Code, and consistent with the accompanying advice and guidance?

2. Do you have an existing institutional policy on e-assessment? How could existing policies be adapted for the current circumstances?

3. Do all assessments require a change to practice, or will some remain unaffected?

4. How will you assess learning outcomes without invigilated exams and, where relevant, practical examinations so that the outcomes are equivalent to other years?

5. Are there professional body requirements that will need to be taken into consideration? For example, some professional bodies might require proctored exams.

6. Is there scope for assessment or exam questions to have greater emphasis on unique case studies and scenarios, or on comparative analysis, rather than using fact-based responses?

7. Is the use of viva voce being considered to guard against academic misconduct? And, if so, are special regulations or policies required?

8. How much flexibility can be built into the timescales for students to complete assessments, for example, to help with students' anxieties?

9. What adjustments will need to be introduced to promote equality, diversity and inclusivity for students as a result of the move to online learning and assessment?

10. What allowances can be made to recognise that students have different levels of ability in using technology and engaging with online assessment tools, where these are not directly relevant to their learning achievement?

11. How will you ensure that all students can access the assessment? Do they have the required hardware and software, and do they understand the process for assessment submission including logistical issues such as start and stop times, log-in passwords, and how to save their work? Do students know who to contact if they have problems with these aspects?

12. Technical issues such as computer problems and unreliable internet connections are not normally considered an extenuating circumstance. Should this approach be modified under the present circumstances?

13. Do marking protocols need to be reviewed?

14. How are you working with your students' union to secure engagement with any changes in assessment practice?

15. How effective is your communication with students about necessary changes? Have you considered preparing responses to frequently asked questions?

Additional questions to consider for students based outside the UK:

16. Are students studying in different time zones able to access the support they need?

17. If there is a need for collaborative working, are groups able to function effectively across different time zones?

18. Are there any technology barriers that might present issues in accessing materials and submitting work? Can students studying outside the UK still access the sites and services they need?

Insights for startups

Observation	Implication
Spring/summer 2020 marks a transition point. The problems universities face will change very quickly as circumstances evolve. There will be a period of turmoil for universities. Paying very close attention to their concerns right now is going to be especially important for startups.	Startups can support universities by developing close relationships and listening to them in order to understand, deeply and in detail, their situation, how it is affecting their staff and students and what they are worried about for the future. Universities may be more willing to experiment with new things – especially if startups really do understand the problems universities are facing as a result of the pandemic and how they are thinking about change for the longer term – and may offer co-creation possibilities.
The need for universities to be able to scale up has been thrown into stark relief and has been one of the most challenging elements of the crisis.	This is where startups can make a difference with solutions that meet this need, with fully digital assessment systems that enable scaling-up and with the efficiencies that brings.
Universities' solution choices are constrained by students' access to technology and connectivity away from campus.	Startups in this space can help universities deal with this difficulty by offering a range of options – for example, making it possible for their platform to work in an offline environment if internet connectivity is lost.
Different subjects have their own complexities when it comes to digital assessment, whether that's the need for large amounts of storage space for some visual or media subjects or the difficulty of showing 'working out' online in STEM exams.	There is a real opportunity here for startups to set themselves apart by having a deeper understanding of domain diversity in order to offer solutions to these very specific challenges.
Integration is an issue, according to Rebecca Galley, OU: *"I think that technical solutions are being rolled out fast and I think there will be benefits and disadvantages of doing that. In most cases they're being rolled out in an unintegrated way, so new tools are not being properly integrated with core systems. And I think that that will have an impact on digital student experience that will need some unpicking over time."*	If startups work in partnership with universities to co-create solutions, it is more likely that they will be able to integrate their solution seamlessly with existing university systems and have a significant advantage.

Q+A with Wayne Houlden, founder, Janison

Janison is an Australian-owned, ASX-listed education technology pioneer whose team of experts and developers innovate online assessment and learning solutions for global corporations, governments and education bodies. Janison has delivered more than 5m assessments in the past 12 months.

What do you see as the greatest challenge universities are facing right now in terms of assessment, given COVID-19?

The challenges depend on how universities want to solve the problem. Some are trying to reduce the number of exams. Others are taking the opportunity to accelerate a planned move to a digital platform for exams. Others are looking at hybrid approaches, where they might use quiz engines inside learning platforms and possibly some proctoring software. Each of those approaches is valid in the context of the decisions confronting universities.

We work within the third option as we provide secure, proctored, resilient digital assessments for universities and other bodies, such as the University of London and the British Council.

Digital proctoring can take two forms. At the first level the candidate is video recorded. Their environment is scanned before they start the test and the video stream is analysed by an AI system that flags up anything it thinks constitutes a potential red flag in the candidate's behaviour during the test, which is then escalated to a human who can review the video and decide whether it needs intervention.

At the next level, a human proctor watches a student taking the test via a video stream. An AI sits behind that, providing additional support. We tend to use invigilators in the UK or Australia who were previously working for exam boards as physical invigilators and have moved to digital.

What about the trade offs that universities have to make? For instance, with digital proctoring, they might have to decide if the increased security outweighs the risks?

One of the key learnings from these last few months is just how capable we all are of making change if we want to, from extensive work-from-home policies to the use of Zoom, Teams and Hangouts for meetings, with very few glitches in the technology. I think one of the things that will come out of this period is people will have built some confidence in digital technology being able to solve problems, connect people and provide communication channels. That can extend into digital exams and, for the vast majority of students who use online invigilation, their experience is going to be a good one.

Our platform, in particular, has a number of key features that kick in if a student's internet connection fails. Our test environment – the tools that provide the digital exam to the students – is able to continue to play and record the students' responses even if they have a complete disconnection and, at a later stage, also provide the proctored session back to the server. Our human proctoring system has the same capability.

How do you see the current situation changing assessment and is it a long-term change?

It's probably one of the most exciting periods of my career in many ways. Every day we're working with organisations that are incredibly motivated to look for ways to meet the challenges of successfully delivering exams right now and using technology to do so. The conversations are leading to the rapid development of extra features – because we're discovering new components of how people provided those exams on paper – and they're being quickly adapted into the platform.

I think a lot of people who have seen the benefits of using technology for this situation will move forward with the technology and continue to expand on it. If you look at the University of London, we know that delivering exams in remote locations around the world is an expensive, logistical problem. Using digital technology is far more efficient and cost effective than creating face-to-face environments globally. We don't know for how long those face-to-face environments are going to be closed and we do know that higher education budgets are going to be severely tested in the coming year.

So if we've got technology for equivalent or better ways that are also cheaper than paper exams, it makes a lot of sense for universities to continue. Looking further ahead, one of the most important challenges technology can help to address is how to make assessments more authentic, whether that's through using collaborative tasks as part of that assessment or engaging with virtual environments.

What insights can you offer to a startup in this field?

Startups need to find a niche that allows them to develop innovative practices and build credibility. Strong relationships and partnerships with organisations are essential to gain a rich stream of information and knowledge to guide them in their journey. There are some great opportunities for further innovation in this field but startups need to understand the art of assessment. Some people take for granted the art that's involved in creating, marking, analysing and contextualising great assessments.

When I reflect on the 10 years I've spent specifically in assessment, the most rewarding part is working with committed people with amazing minds who are driven by the desire to do good through testing. Sometimes testing gets a bad name, because it's seen as high stakes and sometimes high stress. It certainly can be, but there's a huge amount of value in what we do. The people that work in these areas really understand and respect that value. It's an incredible pleasure and honour to be able to work with them.

- **The content of this report is independent of any particular solution provider.**

Acknowledgements

Emerge Education and Jisc would like to thank all the contributors to this report for their time and expert insight. In particular, we would like to thank the members of the Jisc – Emerge Education advisory board on the future of assessment, led by Chris Cobb, and everyone who so kindly spared the time to be interviewed for a case study during an exceptionally busy time for all involved in assessment in higher education. Thank you.

Marcelo Adler, CFO, Grupo Tiradentes
Sue Attewell, head of edtech, Jisc
Samuel Björklund, business development manager, Sana Labs
Douglas Blackstock, chief executive QAA
Paul Cashian, institutional lead for assessment, Coventry University
Chris Cobb, pro-vice-chancellor and deputy chief executive, University of London
Mary Curnock Cook, network chair, Emerge Education
Maren Deepwell, chief executive, Association for Learning Technology
Allison Doorbar, managing partner, Eduworld
Paul Feldman, CEO, Jisc
Rebecca Galley, director of learning experience and technology, OU
Paul Gough, principal and vice-chancellor, Arts University Bournemouth
Daniel Haven, founder, ProctorExam
Wayne Houlden, founder, Janison
Simon Howells, business analyst, Manchester Metropolitan University
Emma Hunt, deputy vice-chancellor, Arts University Bournemouth
Alexander Iosad, head of engagement, Emerge Education
Ian Kimber, director, strategic projects, QAA
David Kofoed Wind, CEO, Eduflow
Jan Lynn-Matern, CEO and founder partner at Emerge Education
Lucy Lynn-Matern, principal, Emerge Education
Andy McGregor, director of edtech, Jisc
Shinaz Navas, associate at Emerge Education, author
Nic Newman, partner, Emerge Education
Craig O'Callaghan, University of London worldwide director of operations and deputy chief executive
Mariann Rand-Weaver, vice-provost (education), Brunel University London
Graeme Redshaw-Boxwell, learning enhancement and technology team manager, Newcastle University
Klaus-Dieter Rossade, director of assessment programme, OU
Helen Smallbone, academic registrar, Edge Hill University; chair, Academic Registrars Council Assessment Practitioners Group
Natalie Smolenski, co-founder, Learning Machine
Andrew Turner, associate pro-vice-chancellor, teaching and learning, Coventry University
Alex Young, CEO, Virti

Thank you to report sponsor, **Janison**

Authors and editorial team

Alexander Iosad, head of engagement, Emerge Education
Michelle Pauli, Michelle Pauli Editorial
Sue Attewell, head of edtech, Jisc

About Emerge

Emerge Education is a European seed fund investing in exceptional 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 founders/investors of Trilogy and 2u. The team has a solid track record with 50+ investments, with those companies raising £100m+ from investors such as Local Globe, Stride, Project A, Rethink Education, Learn Capital and Reach Capital. Emerge also convenes Edge, a series of thought leadership forums for higher education and corporate leaders working on addressing the skills gap in their organisations and beyond. Through Edge, Emerge is able to help founders gain unique customer insights and build defining business partnerships that help their companiesgrow faster.

Email: info@emerge.education
Website: emerge.education

About Jisc

Jisc is a not-for-profit providing the UK's national research and education network (NREN) Janet, and technology solutions for its members – colleges, universities and research organisations. It is funded by the UK higher and further education and research funding bodies and member institutions.

Email: info@jisc.ac.uk
Website: jisc.ac.uk

Emerge Education
15 Fetter Lane
London
EC4A 1BW

info@emerge.education
emerge.education
@emergelab

Jisc
4 Portwall Lane
Bristol
BS1 6NB

info@jisc.ac.uk
jisc.ac.uk
@Jisc

May 2020

emerge education

Universities UK

Handshake

Employability rebooted

Democratising the future of work

From fixes to foresight: Jisc and Emerge Education insights for universities and startups

Report 3

Jisc

Foreword

It is rare to be able to call an event cataclysmic without exaggeration. But, in the case of the effects of the Covid-19 crisis on students graduating in 2020, it is not hyperbole.

The class of 2020 will have faced severe disruption while seeking to complete their degrees, with final assessments altered and placements that contribute to completion either cancelled or suddenly turned virtual. They may have seen the part-time jobs that support their studies end abruptly – or become far more intense if they were in the supermarket, healthcare or agriculture sectors. As they look to take their next step in the world, students graduating in 2020 are entering an entirely different employment market to students in previous years. Graduate job offers are being deferred or rescinded. The economy is facing a long and uncertain road back to recovery.

When I started chairing the advisory group on employability and diversity convened by Emerge Education and Universities UK in partnership with Handshake, our primary area of investigation was the employability journey of students from underrepresented backgrounds, looking at enrolment at university through to first experience of the workplace. We mapped key touch points on that journey and took an ambitious look ahead to what a more democratised employment journey in 2030 could look like – and how we might get there.

As the impact of the global pandemic became clear, our focus of investigation shifted to take an in-depth look at the here and now – how careers services are rising to the challenge of supporting students through these times – and considered how these changes will play out over the 10-year horizon.

We believe that, by harnessing the power of technology, the employability ecosystem by 2030 will have become more networked, tailored and accessible, transforming the employability journeys of students from underrepresented backgrounds and democratising the future of work.

This report seeks to stimulate thought and debate, and to prepare us all for the opportunities that technology offers to democratise employability. I hope that universities, policymakers and innovators will find it thought-provoking and useful as we move into the next phase of these extraordinary times.

Professor Quintin McKellar
Vice-chancellor, University of Hertfordshire

Foreword

When we consider the student employability journey there are numerous “gaps” that exist and hurdles students need to overcome to ensure successful employment.

There is the gap between what is taught and what is needed in the workplace, the gap between the experience of education and the experience of the workplace and a gap in outcomes, especially for students from underrepresented backgrounds.

Universities have increasingly engaged in activities such as internships, employer input into the curriculum and one-on-one careers advice to close these gaps. All of these activities involve bringing universities and employers closer together earlier on in the student experience. It is in employers’ interests to do this because, to prosper, grow and succeed, they need graduate talent with higher-level skills. In the future learners need to become more like employees and employees need to become more like learners.

We are grateful to Emerge Education for enabling our Innovation and Policy Network to improve these links with employers at the highest level. It has been especially rewarding to work with a group of employers and business leaders who offer a fresh perspective and are often difficult to connect with: startups.

If we had proposed only a few months ago that the entire higher education sector should switch to online delivery in a matter of weeks we would have been dismissed as fantasists detached from reality. Yet this has happened. It demonstrates that the extraordinary can be achieved in the face of unprecedented challenges.

We now face the challenge of economic and social recovery. Universities and their staff and students have a vital role to play. However, one risk of a recession is that those already disadvantaged in the graduate labour market see their prospects worsen, compounding the existing gaps.

This report shows that, with the advice and support of startups and the smart use of technology, it doesn’t have to be this way. We have the potential to change the landscape of the employment journey in a way that defies the traditional impacts of a recession and enables students, universities and employers to bridge the gaps that exist. It is an ambitious agenda but the sector has already achieved the remarkable in response to Covid-19. With the recommendations in this report it can do the same for student employability.

Greg Wade
Policy manager,
Universities UK

From fixes to foresight: Jisc and Emerge Education insights for universities and startups

At Jisc and Emerge Education, we believe that education technology (edtech) has rich potential to help UK universities solve their biggest challenges. We see edtech startups as key to the innovation and agility that higher education needs to navigate the rapidly changing present and future. This is a critical part of building a sector that is resilient to unforeseen changes and that can further transform using advanced technologies, as part of our vision for an Education 4.0.

We have worked as close partners for several years and our collaboration brings together Jisc's 30+ years of experience in providing digital solutions for UK education and research, and Emerge's in-depth knowledge of the edtech ecosystem based on investments in 55 startups in five years. Together, we've developed unique insights into the potential of edtech in higher education.

To unlock that potential, we're undertaking a programme of research. It's focused on exploring the most urgent priorities that university senior leaders will face over the next three years, which we investigated and set out in our initial joint report, The start of something big? Can edtech startups solve the biggest challenges faced by UK universities?

Priority one
Delivering the best, most equitable student experience.

Priority two
Adapting to students evolving expectations about employability and career outcomes.

Priority three
Expanding the university's reach by attracting more (and more diverse) students.

Priority four
Transforming digital and physical infrastructure.

Priority five
Recruiting, retaining and developing world-class staff.

Each report in this series explores aspects of each priority in more detail, mapping current approaches and challenges, and highlighting specific edtech solutions and startups. The reports draw on the expertise of leaders from HE, employers and startups, through Jisc – Emerge Education advisory groups on specific topics, including the future of assessment, the employability journey of students from underrepresented backgrounds, student recruitment in challenging times, employer-university collaboration and the student mental health and wellbeing challenge.

We find that there are plenty of opportunities for startups to hear from each other but very few for them to hear from real customers – universities – and understand, in depth, the priorities they have and the problems they are facing. This report series does that, providing startups with the information they need to shape their products so as to ensure they meet university needs. For universities, the series offers insights into how the sector is managing change as well the possibilities for the future.

The work on the reports was well underway when the Covid-19 pandemic hit, and we have seen the university sector adapt more rapidly than many thought possible to the challenges of digital delivery. But in the midst of crisis, it is important to draw a clear line between our immediate response and what it tells us about the future. The reports in this series seek to look across the immediate and long-term time horizons to give readers a map and compass out of the current situation and towards the future of higher education.

Ultimately, we want to build a vibrant, highly effective edtech ecosystem, with seamless collaboration between universities and leading startups, to ensure students get the educational experience they deserve.

Paul Feldman
CEO, Jisc

Nic Newman
Partner,
Emerge Education

CONTENTS

Summary

There are more students from underrepresented backgrounds in higher education than ever before but their job outcomes often lag behind more privileged peers.

Pay gaps and pay penalties persist and the rise of the gig economy has further exacerbated these inequalities. Why is that, what can be done and what role can technology play in supporting students, universities, and employers?

This report considers the student and graduate journey from enrolment at university to first experience of the workplace, and focuses on key interactions and touchpoints between students, universities and employers along that journey. By mapping out key points at which access to specific experiences or interventions can help or hinder the employment prospects of students from underrepresented backgrounds, we are able to highlight examples of best practice and specific opportunities for universities, employers or technology startups to provide more support.

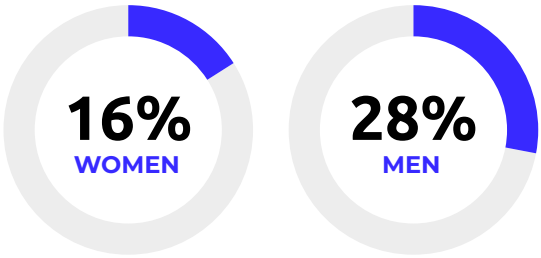
The first part looks at the immediate crisis situation and the impact of Covid-19 on the 'bridge to work' of the graduating class of 2020. A recent Prospects survey of 5,000 students found that 29% of final year students have lost their jobs and 26% have lost their internships, while 28% have had their graduate job offers deferred or rescinded. The latest Institute of Fiscal Studies figures report that job postings at the end of March were just 8% of their levels in 2019. What effect is this having and how are universities and employers responding? How are the measures forced on careers services and graduate recruiters by lockdown, such as virtual assessment centres and virtual careers fairs, playing out? What digital tools and platforms are they using to support their work – and what are they lacking? Through seven case studies we explore the challenges faced by careers services in supporting students in these intense times with a particular emphasis on the impact on students from underrepresented backgrounds and any extra barriers they may be facing.

The second part looks ahead to a vision of a more democratised employment journey in 2030, in which technology is used effectively at every step of the journey. We consider the factors involved in improving the employability prospects of students from underrepresented backgrounds and imagine what their employability journey should look like in 2030 to maximise the positive impact of a university education on their ability to embark on meaningful careers. With an eye to the role of technology in supporting students, university staff and employers, we suggest that in 2030, the employability journey must be networked, tailored and accessible, taking each in turn to identify the benefits of such an integrated system.

Finally, the report offers advice for universities and employers plus insights for startups to help them initiate productive conversations, tailor effective solutions and maximise their impact.

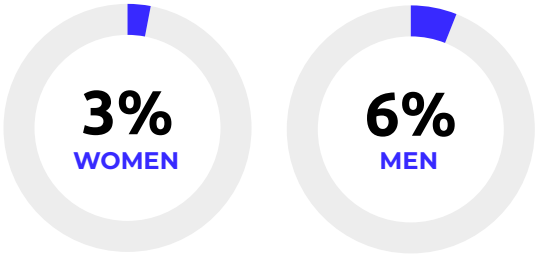
Throughout this report we use 'underrepresented' to mean students and graduates who come from groups with low participation in higher education or from backgrounds that have, in the past, been denied equal entry into universities. It may include students from BAME backgrounds, those from areas of low household income or socioeconomic status, mature students, students with disabilities, care leavers or carers. When it comes to graduate career outcomes, it may also include women. In short, we are most concerned with those who are hardest hit by inequalities in access to higher education or post-university careers.

First degree earnings of £30,000+



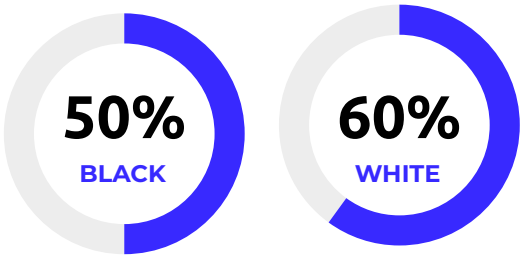
Only 16% of women with a first degree earned more than £30,000 within 15 months, compared with 28% of men.

First year earnings of £39,000+



6% of men earned more than £39,000 a year after graduation, compared with 3% of women.

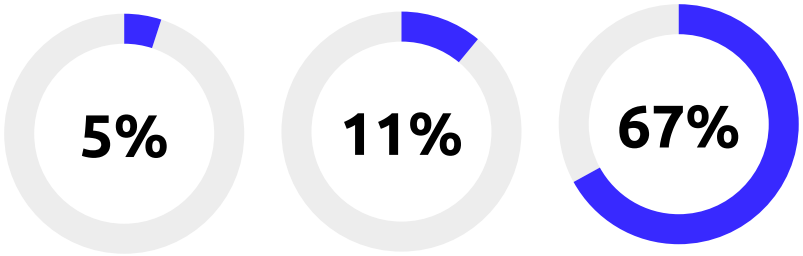
Full-time employment one year after graduation



Only half of black university graduates were in full-time employment more than a year after they left, compared with more than 60% of white students.

Source: HESA (2020) Higher Education Graduate Outcomes Statistics: UK, 2017/18

For English-domiciled care-experienced and estranged students due to graduate in 2020:



Only 5% have a job to go to that is likely to go ahead as planned. 11% have had job offers postponed or withdrawn and 67% have no job and no plan to go to further study.

Source: Become, Stand Alone, the National Network for the Education of Care Leavers (NNECL), the Unite Foundation and Spectra (2020) Financial Survey

Introduction

The coronavirus crisis has had an immediate impact on the work that university careers teams do with students. The lockdown and social distancing measures have resulted in services being moved online at speed. Staff have had to grapple with the social and technical logistics of virtualising things that may have felt inherently physical, from careers fairs to internships.

Longer term, the forecasted deep global recession will also have a profound impact on the student employability journey and the work that careers services do with students. In these case studies, we share an overview of how seven universities are dealing with the situation and we take a closer look at the impact on students from underrepresented backgrounds and any extra barriers they may be facing.

What role is technology playing and could any of the measures being taken help to level the field in any way?

Six fixes

1 Trailblazing

Radical change at speed and at scale

Example: University of Liverpool

What is Liverpool doing?

The University of Liverpool's careers and employability team is unusual in that its 'frontline' – the drop-in service where students physically meet a career coach and chat through their future or concerns and get advice on applications – is delivered by student career coaches, who are both paid members of staff and students. That service was rapidly moved online along with a full digital offer, including online advice, video interviews, online CV checks and interactive digital resources. In addition, the career coaches were asked to make a series of short blog posts and videos about how they were feeling, addressing key concerns, such as cancelled placements and anxiety about getting a graduate job, in the student voice.

"We started the peer-to-peer element of what we do two years ago and it's been such a success. Students have really liked speaking to other students about their career plans and co-exploring opportunities. One of the things that's come out from research we've done around that is that it's all about the shared experience. That shared experience is going to be even more important going forward because no one is going to understand better the concerns of a student than another student who is living those same concerns at the same time. Our coaches are skilled in finding where resources are. They don't have all the answers, but that practice of co-exploration is also going to be key going forward because everything is so uncertain that nobody really has the answers."

Emma Moore, director of careers and employability

Liverpool's spring careers fair was due to take place just as lockdown began but, while the physical event was cancelled, the careers team moved swiftly to give it an online presence. They quickly organised virtual events that took place on the day instead so that students could still interact with some of the employers that were going to be there.

By the second week of lockdown the careers team had launched Virtual Connect, a programme of employer events where students can interact with employers in different ways, from webinars and Zoom chats to virtual office tours, which has proved popular.

"Having to do that very quickly showed us some of the wrong ways to do things as well. Trying to recreate a physical event virtually we found there were lots of pitfalls. But it also gave us an early taste of what was going to be popular with students and what actually works and it got us moving quickly on the events side."

Emma Moore

How is the crisis affecting students from underrepresented backgrounds?

"By moving our frontline offer to being staffed by our peer-to-peer student coaches, it's freed up our professional staff to give very high-value, high-intensity support to underrepresented groups, like care leavers, who may not have traditionally sought out services."

Emma Moore

Liverpool is focusing on three groups of students in particular: commuter students, care leavers and disabled students. They are all being affected in different ways. Commuter students, who tend to live at home with their parents, may not feel the extent of the impact immediately if there has been little change in their home situation but are more likely to have lost a part-time job that they rely on to earn income to support their studies. It is likely that the regional SME jobs market may be very bleak, which will impact them disproportionately.

For care leavers, a cohort with whom Liverpool works hard to develop relationships from very early on in their university experience, the Covid-19 crisis has been particularly difficult. Without a parental home to go to or other sources of support, many of these students have had to isolate in their university accommodation. The careers team have stepped in to offer in-depth support through weekly check-in chats, using time freed up by the peer-to-peer network tackling more routine matters.

The issues faced by students with a disability are wide-ranging and the careers service has a particular focus on students with autistic spectrum disorders, who may find accessing virtual content and interacting with potential employers via technologies such as Zoom very difficult.

"Our whole graduate population is going to be severely affected going into the jobs market through this, but I would say those groups of students even more so. At the same time, we supply a lot of bursaries for students to buy the right clothes to wear for assessment centres, support the cost of travel and hotels. If those assessment centres move virtually then those issues are gone and it does make things a bit more level and accessible, which is positive."

Emma Moore

How is technology helping or lacking?

"Our partnerships with consultants and suppliers have come into their own at the moment. Being able to chat through issues around technology with them has been invaluable for us."

Emma Moore

Liverpool has a package of online tools that students can use while at the university. This year, this offer will be extended to its graduates. The package should also include access to LinkedIn Learning License for two years after graduation. The package also includes access to the Handshake careers platform, the video interview software Shortlist.Me, Graduates First, practice online tests and the opportunity to attend a virtual assessment centre or to complete a virtual internship.

Example: Staffordshire University

What is Staffordshire University doing?

Like Liverpool, Staffordshire University (Staffs) has a peer-to-peer model. Since October 2019 all of its one-to-one front facing career provision has been delivered by existing students. The 11 student career coaches are employed on weekly 10-hour contracts, having been through an intensive training programme. They were recruited to be reflective of the student body, encompassing commuting students (the majority of Staffs students) and international students.

"When the pandemic hit, the ability to switch to remote support worked very well because the students that we've got are very tech-savvy. They have all the equipment so, with the flick of a switch, they were able to deliver all the one-to-one peer-to-peer support that they were delivering before."

Martin Perfect, head of student and graduate employability

Staffs is considering its options in terms of virtual careers fairs but, more significantly, has moved GradEX, its one-day university-wide final year exhibition, online for the first time and seen a 25% rise in submissions from students compared to previous years. It will also enjoy greater reach - rather than the 1,000 employers who have tended to turn up on the day, the online exhibition will be sent to the university's 6-7,000 employer contacts.

"From an employer's perspective, across the summer months and into the autumn they can access that portal and have conversations with students at different times and at different stages. It opens it up to more people and over a greater length of time. It's a real success story moving online."

Martin Perfect

In addition, Staffs offers lifetime support to its alumni and is anticipating working intensively with its 2020 graduates that are finishing this summer. It is also contacting and sharing the stories of alumni from 2008, who can share their experiences of their first 12-18 months of graduating during a recession and the positive stories of where they are now, 12 years on.

How is the crisis affecting students from underrepresented backgrounds?

"Engagement is always a challenge. Wherever careers and employability provision isn't in the curriculum and students have to opt in to employability activity, generally what we see is that students from underrepresented backgrounds focus very hard on the academic side and maybe don't engage as much with us. In the last three or four months, we've seen that more and more."

Martin Perfect

Staffs long-term response, supported by the move to a peer-based frontline, is to focus resources on professional career relationship managers who work individually with each school, reaching an in-depth understanding and better

embedding employability into the curriculum.

"By investing the time to understand the needs of students and getting close to academics that are delivering in all of those areas, you can offer the nuanced and tailored support that the students need."

Martin Perfect

More immediately, concerned that some students might lack confidence and be panicked into taking the first job available, whether graduate level or not, the careers team is running a focused series of labour market sessions for final year students. These attempt to dispel some of the myths about the current state of the graduate labour market and engender a more positive outlook as they embark on their job search.

Access to technology has been a challenge for some students from these backgrounds and the university has stepped in with hundreds of laptops, devices and dongles for connectivity.

How is technology helping or lacking?

Video interviewing software that enables students to practice interview techniques has proved successful at Staffs. The university also has a long-standing partnership with Microsoft and offers Microsoft Office specialist exams, which are free to its students. Around 1,000 students have taken these exams in subject areas such as Word, PowerPoint, Excel, which provide formal certification from Microsoft.

"We've had very positive feedback from employers. Historically, there has been a criticism that students just out of university might be academically strong but not up to speed with a lot of business-related technology and systems. We've made a good leap forward in that space."

Martin Perfect

2 Innovative:
Building on an innovation base and scaling it up

Example: University of York

What is York doing?

Thanks to its location in the North Yorkshire area, surrounded by many isolated businesses in need of graduate support for projects, the University of York has been an innovator with virtual internships. The university initiated them five years ago and they are now a core element that has enabled a relatively seamless transition to an online service.

"We adapted our process about five years ago, and that's now coming into its own. We're looking to run virtual internships on campus roles as well,

working for both professional and academic departments."

Tom Banham, director of employability and careers

In addition, York's core offer has become fully virtual, with meetings for advice and placement opportunities held on Zoom or Google Meet, and a number of skill-based interventions, such as interviewing skills and automated CV technology (with direct feedback on uploaded CVs in two to three seconds) made through an online platform. York is also putting in place Zoom-based practice assessment centres for students to gain experience, given that many employers have transitioned quickly to Zoom-based assessment centres.

How is the crisis affecting students from underrepresented backgrounds?

"The challenge for certain students will be having the technology. There'll be students who don't have a laptop and who don't have access to wifi. There'll be students who live in a one-bedroom flat, sharing a room with other family members, and don't have quiet study space. We have to take all this into account when we're supporting students as a university."

Tom Banham

While the move to online may democratise some opportunities because mobility will no longer be an issue, access to technology may become more of an inhibiting factor. In response to this risk, York has set up a student support fund, providing bursaries to students who face unanticipated financial challenges due to Covid-19. Those challenges can include technology costs associated with online learning. If demand is high, priority is given to certain groups, such as care leavers, students with children, students with disabilities and students with refugee or asylum-seeker status.

How is technology helping or lacking?

York uses TARGETconnect and will be migrating to Handshake for the next academic year. The university uses an automated CV tool and a virtual mentoring system that allows students to engage with alumni. It also has interview technology tools, so students can practice video-based interviewing, and assessment centre activities.

"Tech firms have really stepped up and demonstrated their offer. It's fantastic that organisations like Handshake and GTI have adapted their offer and are supporting students free of charge."

Tom Banham

3 Innovative flexible:
Maximising fairness and flexibility

Example: Ulster University

What is Ulster doing?

The impact on placements has been a big issue for Ulster University because a number of its placement models are accredited and an integral part of the degree programme. The university set up a strategic Covid placement group along with a placement response team to deal with the issue, having pledged that students should not be disadvantaged when it comes to how their placement will be assessed.

Ulster is now looking at new, hybrid models of placement that support civic and economic recovery, coupling enhanced learning and development programmes with innovation components and periods of real work-based learning, and fully exploring flexibility and innovation within each element. This is likely to be more resource intensive as students will need to be better prepared for new placement and work experience opportunities, and staff will be required to fully exploit digital technologies to broker new relationships between students and employer networks, to deliver increased availability of virtual placement, remote working and flexible internships. Part of this new delivery model may include a brokering and matching service: finding the opportunities and matching students into them, possibly removing the recruitment experience. The hope is that it will ease both student and employer barriers to engagement.

Ulster is also looking at more consultancy support for employers around their recruitment needs and at smaller and more focused virtual recruitment events for particular sectors or courses rather than the large careers fairs of the past.

"Everyone wants customised, personalised events and opportunities. I think that's an opportunity and something that will be welcomed by all stakeholders. It's more responsive to both sector recruitment needs and students getting access to timely and relevant opportunities."

Shauna McCloy, head of careers and employability services

How is the crisis affecting students from underrepresented backgrounds?

"The immediate impact is that a lot of our students will have opportunities withdrawn from them, whether that's employability or skills events, internships, placements or graduate job offers. There are going to be trigger effects to this, that are going to be very significant and profound for widening-access students."

Shauna McCloy

Around 37% of Ulster University's students come from a widening-access background and so the university has

existing infrastructure and additional levels of support in place. There are solutions available for providing technology support and equipment to ensure equality of access to all aspects of virtual campus and online provision.

However, challenges and concerns are ongoing in relation to the pandemic's impact on mobility opportunities, as support avenues for employability are largely focused on encouraging students who are managing widening-access contexts to consider learning and work experiences outside of Northern Ireland, whether it's to other parts of the UK or further afield.

How is technology helping or lacking?

Ulster uses a range of tools such as TargetConnect for student opportunities and events, VMock for automated CV reviews, Aluminati for alumnae mentoring and internally developed staff and student employability portals that provide additional customised employability information and analytics. The careers team also works with the university's learning management system, Blackboard Learn, so that employability is integrated within the core curriculum and core learning and teaching space.

"There are a wide range of essential tools identified and our challenge is to help our students to navigate them in a user friendly way, as we work towards a 'one stop shop' for all of their employability needs. We have identified Handshake as a solution which will enable a streamlined system solution for a number of services that currently utilise an extended number of disparate technologies. For all of our stakeholders – students, staff, employers, and the careers team – everything is there. It provides all of the analytics and reporting functionality that we require in terms of having central control and oversight of the business intelligence to help us to strategically navigate and direct work that we do."

Shauna McCloy

Finally, the career service's excellent digital skills have been invaluable to the university, ensuring that employability remains embedded in core learning and teaching activities and, through close collaboration with academic staff, supporting the rapid move to remote learning. The team provided an immediate response to mobilise learning materials online, revise assessment and feedback strategies and design new online learning activities to embed employability into the curriculum.

"All of our staff have extensive training in digital tools for embedding the learning and teaching of employability, including assessment and feedback. We fully deploy the integrated curriculum design framework, in close collaboration with university faculties, demonstrating our added value as a core and essential part of the learning and teaching provision."

Shauna McCloy

4 Innovative flexible:
Maximising fairness and flexibility

Example: University of Hertfordshire

What is Hertfordshire doing?

When its spring fair was cancelled in March, followed quickly by lockdown, the immediate issue for the University of Hertfordshire (Herts) was the students using its placements service, which runs alongside its career service: overseas students had to be repatriated and, for those in the UK, the service had to work out and discuss options, not least whether each placement could continue and whether it could be done from home.

This major undertaking complete, the careers team turned to the future and, in particular, two significant decisions. The first was to extend its leavers' summer programme and to add ongoing students who were clearly going to have labour market issues for some time to come and needed to begin preparation now. This created a vastly bigger programme than ever before. Non-virtual workshops were reconfigured for online use and new workshops were added to tackle current realities (eg negotiating with employers if your contract is ending).

The result was a programme stretching from May throughout the summer, designed to motivate and upskill students and leavers, and to help them access the jobs that are still there and the graduate programmes that are still recruiting.

The second was to assess the feasibility of physical fairs, physical assessment centres and physical internships in the autumn, and commit early to virtualising them. Herts had high engagement from both employers and students for the summer SME Internship Scheme, advising companies on how to manage the interns virtually. This experience will be taken into the autumn term. The team also assessed the virtual fair platforms available and made its recommendation for the autumn.

How is the crisis affecting students from underrepresented backgrounds?

The majority of students at Herts are from underrepresented backgrounds. As a result, the university has a history of embedding employability initiatives into the curriculum, as well as running a number of specialist programmes that attract high numbers of BAME students.

"We've always had those kinds of programmes but in 2016 we piloted a mock assessment centre, with the business school, for 450 students. Now we have eight of the nine schools and the mock assessment centre is run over three weeks for 3,100 second years. That's where we put a lot of our resource. Many of our students don't have the cultural capital of more privileged students. They don't necessarily know about the whole process of what assessments look like

in large companies. For us, it's a game-changer."

Judith Baines, head of careers and employment service

The challenge is to take mock assessment centres online by the autumn. There are downsides to making them online-only – for example, for students from home environments who struggle with quiet space, internet bandwidth and adequate equipment – but they would mirror the online environment students will face in 'real' virtual assessment centres. Herts recently committed to running them virtually, with the academic staff on board.

How is technology helping or lacking?

"Technology to me is not a solution. It's an enabler. It lets you scale up and it lets you bring more opportunities to students, while freeing up the time for the career service to still have one-to-one interventions but much more targeted, focused and supportive of students."

Judith Baines

As an enabler, the technology of virtual assessment centres and career fairs – if the providers get it right – can be a great leveller, enabling large employers to reach more universities, and more students of different backgrounds, than their resources have allowed hitherto.

"The more fairs go virtual, the more access our students should have to a wider range of employers who may not have looked to us before. That has to be one good thing to come out of this."

Judith Baines

5 Radical:
Minimising stress in the student experience

Example: University of Miami

What is Miami doing?

"In addition to being responsive, we are actually looking at it from a lens of 'potential' because out of these kinds of situations, innovation happens oftentimes. Sometimes a solution has been right in front of your face the entire time. You don't realise that until something like this happens. So I've challenged my staff to not look at this from a perspective of, 'Oh, we have to adjust,' but, 'No, let's innovate. Let's try something different'."

Christian Garcia, associate dean and executive director, Toppel Career Center

Most of Miami's resources, services and tools were already online and it

had switched to a drop-in peer-to-peer model two years ago, which it could quickly and easily move to a virtual environment.

Miami has also decided to go virtual on all of its career service events from enormous career expos and graduate school fairs to subject-specific events such as the accounting career fair.

"Even if we're back on campus, I don't think we're ever going to get back to 'normal', at least not in the next few years. Do we really want people to be in a room with 2,000 others, shaking hands? I just don't think it's realistic. I don't know that employers are going to want to do that, or that they are going to be in the position financially to be travelling to college campuses, so virtual events make most sense."

Christian Garcia, associate dean and executive director, Toppel Career Center

How is the crisis affecting students from underrepresented backgrounds?

Diversity, equity and inclusion are a key focus for the Toppel Career Center at Miami, which includes educating, informing and training careers staff on the variety of different student populations and the issues related to those populations, and engaging with those students.

"It's one thing to learn about them but then you need to be present in those spaces and they need to see you as an ally, whether it's first generation, black students, Latinx students or LGBTQ students."

Christian Garcia

While access to the necessary technology has not been raised as a major issue by students at Miami, the move to virtual – and unpaid – internships is more challenging. Toppel has an internship fund dedicated to providing up to $3,000 to students who are participating in unpaid internships and need support financially. Demand for that fund is increasing. The service is also highlighting 'micro internships' which are not full-time and allow the student to take a paid part-time job but still benefit from the skills acquired in a career-focused internship.

How is technology helping or lacking?

"The biggest difference between now and 2008 is the technology we have now. It has really transformed what we do. To be able to provide access to those students who don't have the network, the social capital, compared to their peers has been amazing. It's all about democratising access. The fact that now they have way more job opportunities and internship opportunities at their disposal is great."

Christian Garcia

Miami uses three main platforms. Foremost is Handshake, which it particularly values for its algorithm-based recommendation engine, facility to connect students with peers across the world – to share experiences and advice on jobs, interview processes etc – and ease of use. Miami also uses PeopleGrove to enable students to connect quickly and easily with alumni to discover who is working in the areas they would like to go into and develop mentoring relationships. Finally, Miami

uses a new platform, Interstride, dedicated to international students, which filters job postings according to residency requirements and much more.

"I was a first-generation student and I often put myself in the shoes of the student today. What if I wanted to go into Wall Street? How would I have done that? My parents were immigrants. Nobody in my family, not even distant cousins, knew about that world. How would I have been able to figure it out? So my heart always goes out to these students, and that's why the platforms we use are critical for students who don't have those networks. They're competing with other students who have parents, grandparents and even great grandparents with a legacy of college education and professional experience."

Christian Garcia

6 Incremental: Building on experience

Example: Falmouth University

What is Falmouth doing?

As an arts-based, creative-based university, Falmouth has had to move quickly away from the traditional degree show approach to showcasing student work. It has developed a website where students can upload examples of their work as well as setting university-wide challenges – creating digital assets and tools in response to Covid-19 – for students to engage with, in order to offer experiential options within a distanced approach.

The careers team has converted services and opportunities to an online, distanced-focused domain, focusing on repackaging tools and support for students so they can access resources on demand rather than as paper-based resources or physical spaces. It is rapidly moving to a virtual placement model with associated support for students and employers.

Falmouth has a strong background in setting 'live briefs', giving students the opportunity to work with businesses on real life problems and challenges. It sees this as an area of growth, if undertaken in a way that avoids putting additional pressure onto businesses at a difficult time.

"The labour market is under an extraordinary amount of pressure at the moment in terms of opportunities available so a huge amount of innovation is needed. Falmouth has traditionally been very active in that space with live briefs for employers.

We are focusing on keeping those relationships warm, giving students the experience they need and demonstrating to employers what our students are capable of."

Rob Ingram, head of employability

How is the crisis affecting students from underrepresented backgrounds?

For Falmouth, the crisis may open up more opportunities for its students from underrepresented backgrounds. As a relatively geographically isolated university, the travel costs for students to take advantage of interviews and assessments can be prohibitive. The move to more virtual forms of engagement with employers reduces these barriers for both students and employers.

Falmouth prides itself on being an inclusive and welcoming place for students with disabilities. The increase in digital resources, if produced in a fully accessible way, may be a positive development in terms of increasing the opportunities to engage with materials in different ways.

How is technology helping or lacking?

Falmouth uses Handshake for employer engagement with students and also Abintegro and CareerHub. It is in the process of reviewing all its systems, digital tools and resources to create and integrated ecosystem.

"We are looking to create an on-demand career service available for students in the same way that they're able to access Netflix or Amazon Prime at the push of a button. We want the right resources to be available 24/7 for students to support whatever needs they've got. While it was already on the strategic plan, Covid-19 has been an adrenaline boost that has kickstarted development in this area."

Rob Ingram

Challenges

The pandemic has brought into focus a number of challenges for careers services and the students they support:

Virtual careers fairs

Every career service is wrestling with how to move large physical networking events online in the most effective way. Solving this challenge effectively will involve going back to first principles and understanding where the value lies – creating authentic virtual connections at scale between employers and students – rather than simply attempting to digitise an offline experience.

Platform proliferation

As more services provided by careers teams move online, there is an increasing need for more streamlined, integrated and personalised systems that do not require multiple logins and passwords from staff, students, employers, graduates and alumni.

Budget pressures

The right technological solutions are critical, especially for smaller career support teams, but those teams also have smaller budgets, putting some products out of reach.

Increased demand for services

Most career services commit to supporting graduates for a certain amount of time after graduation. It is likely that they will have to extend that commitment for the class of 2020, and possibly future cohorts, putting more pressure on services. In addition, more graduates may choose to defer their entry into the graduate jobs market and undertake postgraduate study instead, if they can afford that option.

Digital skills

Turning face-to-face services into good-quality virtual ones requires digitally skilled staff. In addition, the move to online learning and teaching across institutions as a whole has an impact on how employability is embedded in the curriculum and how career teams work with academic staff, who may also lack effective digital skills. In the Jisc digital experience insights survey 2019, only 34% of HE teaching staff said they were offered regular opportunities to develop their digital skills and only 13% were given time and support to innovate.

"The enablers are having the right staff on your team, making sure that their skill set is flexible, agile, that they have access to the right CPD with dynamic and robust technology solutions available. Creativity and innovation have space to flourish when these enablers are present."

Shauna McCloy, head of careers and employability services, Ulster University

Collaborative skills

Employability initiatives that bring students together to develop valuable team working and problem-solving skills can be hard to replicate online.

Introduction

As the digital shift of spring/summer 2020 has shown, technology offers the potential to make interventions more accessible, scalable and better informed.

How technology can support the employability journey

There are a number of key areas where we see a role for technology in improving the career prospects of graduates from underrepresented backgrounds.

- Connecting students to volunteering, work placement, or micro-internship opportunities, locally or remotely
- Helping students discover and fully engage with experiences that have a proven impact on employability, such as extra-curricular activities or external mentoring
- Removing barriers to project-based learning
- Enabling delivery of curriculum components co-designed with employers
- Allowing employers to recruit, at scale, from wider networks of universities or to access candidates with particular characteristics
- Reducing individual bias at different stages of the recruitment process
- Testing candidates on current skills and future potential in areas most important to the particular employer
- Supporting the onboarding of early-career graduates and their development, particularly around leadership and soft skills
- Providing effective mental health and wellbeing support

The far-reaching potential of these developments and opportunities were fed into and discussed by the joint working group run by Emerge Education, UUK Innovation and Growth Policy Network and Handshake, along with input from university vice-chancellors, experts and senior HR managers from some of the largest corporate employers in the UK.

The result is a vision for 2030 that harnesses the power of technology to transform the employability journeys of students from underrepresented backgrounds and democratise the future of work.

Our vision for 2030 is based on three key characteristics. We see these as the minimum requirements for an effective employability support ecosystem that underpins the employability journeys of students from underrepresented backgrounds.

That ecosystem must be:

Networked

A more connected employability journey will use technology to scale up access to opportunities, so that those opportunities are no longer restricted by university size, location or a student's existing social capital. Greater analytical insight into every step of the journey will make the transition from university to the workplace seamless not just for students, but for career advisers, recruiters, and managers too.

Tailored

By 2030, job discovery, application, feedback and development will be more meaningful and less biased. Across the employability journey, technology will change education and recruitment practices to more closely fit individual employer needs and student aspirations.

Accessible

The employability ecosystem will meet students where they are, rather than depending on on-campus participation, and career support and progression will be embedded in the student experience.

This vision is based on input from university vice-chancellors, experts and senior HR managers, from some of the largest corporate employers in the UK, into the joint working group run by Emerge Education, UUK Innovation and Growth Policy Network and Handshake.

The employability journey in 2030 must be... networked

Built on network effects

The new ecosystem will maximise the opportunities available to students, regardless of the university they attend, by aggregating networks of large graduate recruiters, local SMEs, global remote employers and more, and making all of them available to any university. Technology platforms will drastically reduce the resources required to engage with these global networks, freeing up career services and graduate recruiters to support those students who need it most.

Boosting graduates' personal networks

Mentoring opportunities will be made available and engaging to all, at university and in the workplace, so that every student has someone who can guide them and understands their lived experience.

Proactive, not reactive

Employers won't just post vacancies at recruitment time and hope for the best. They will be able to look specifically for the type of graduate most needed in their organisation and communicate directly with them to build relationships long before job-hunt season.

Connected employability journey

The support received by students and graduates at each step of their journey towards meaningful careers will build on their earlier experiences. Information about their participation in employability-boosting activities will be available to employers in a common format, and data from the recruitment process will feed into the support that early career talent receives from managers and HR in the workplace.

INSIGHT FOR STARTUPS

"I feel like the bane for any career centre, as well as employers, is all these different systems – another system to onboard, another system to get funding approval for. To have something that would encompass everything, that's the dream."

Christian Garcia, associate dean and executive director, Toppel Career Center

The employability journey in 2030 must be... tailored

Supporting meaningful careers

Instead of a handful of graduate routes, the new employability journey will be built around facilitating graduates' discovery of opportunities, careers, employers and job roles. Students' understanding of their career choices will depend less on their existing social capital and instead will be shaped by their competences, experiences, interests and passions, with technology helping them to discover how they could pursue these. Technology will also help employers cope with large volumes of applicants by providing higher-quality feedback to thousands of applicants and sharing strong candidates with other employers, reducing the rate of 'silent rejection' and its adverse psychological effects while helping students discover new opportunities that are a better fit for them.

Future looking

University curricula will be based on a better understanding of future needs, not past performance, and government metrics will eventually follow suit. Universities and employers will work together more effectively to help students understand what the world of work is like and support them to reflect on and articulate how their experience has helped them develop the necessary skills.

Meeting employer needs

Across the employability journey, technology will change education and recruitment practices to more closely fit individual employer needs. Assessment centres based on competencies specific to the company will be common to all organisations regardless of size, not just the large graduate recruiters who can afford the expense. There will be a 'skills API' – a common way of sharing information about skills and competencies that closes the gap between the languages of academia and the workplace.

Mitigating bias

Technology will make bias awareness training widespread and affordable. Where automation is used in the recruitment process, ethical use of algorithms will mean that they mitigate, rather than propagate, existing biases, ensuring fair assessment of performance on common tasks, not of 'future potential'. Digital solutions will help remove common stumbling blocks – for example, making true anonymity of background possible.

The employability journey in 2030 must be... accessible

Meeting students where they are

Employability support will not be dependent on physical presence. This shift will suit on-campus, fully online and blended learning students equally well. It will improve student buy-in and remove the unfairness inherent in the old model of on-campus participation, which many students (such as those with disabilities, caring responsibilities and so on) cannot or do not wish to join. On the employer side, virtual assessment centres will reduce recruitment process costs and open up wider pools of candidates. The experience will be cross-platform, adapted to the technology students use in their day-to-day life and not forcing them to jump through unnecessary and time-consuming hoops.

Embedded in the student experience

Career centres will no longer be a separate silo and technology providers will help universities and employers collaborate across the curriculum and every other part of the student experience, maximising the value each brings to the table. This will help demystify the world of work for students and set their expectations around the skills and attitudes required to succeed in it, improving engagement and student buy-in. The use of intermediary platforms (such as coding competitions) as an 'anonymising' layer between employer and student will help improve diversity in the workplace, with fewer students deterred from applying for positions that feel out of reach for them.

Providing targeted, informed support

Career services will be able to focus on high-value, high-touch activities to support the students who need it most. Data on participation in employability activities, improved training and greater personalisation of support will have a positive effect on underrepresented students' employability prospects, as will opportunities to connect with mentors and peers who better understand their life experiences.

INSIGHT FOR STARTUPS

"The products in the marketplace at the minute are all heavily focused on saving time, effort and money, taking all of the transactional and repetitive duties out of your service and freeing staff up to do higher-value activity. While the products are really good, they're also very expensive and that's a barrier to a lot of smaller employability and career services."

Shauna McCloy, head of careers and employability services, Ulster University

Where does 2020's experience take us?

How will the disruptive events of spring/summer 2020 change the way universities support underrepresented students on their employability journey in the longer term?

"We're having to rip up the rule book, to think about what our service needs to look like moving forward longer-term."
Tom Banham, director of employability and careers, University of York

Underrepresented students face a number of significant barriers along the journey from university to the workplace but there are early indications that some of the technology-driven changes shaping the post-Covid future of learning and work are already reducing some of these barriers, moving the sector closer to the 2030 vision of an employment ecosystem that is more networked, tailored and accessible.

Breaking the geographical binds

"Once we get the hang of virtual assessment centres and virtual fairs then it enables us to do more. I can see us bringing in more SMEs and having smaller fairs. There are a lot of recruiters who may not have come to us before because we're not the Russell Group and we're not on their top list. But it's a lot easier for them to turn to us to help with diversity agendas when we're not asking them to travel. I think, if we're being optimistic, it could actually open up a lot of options for our students, a lot more opportunities."

Judith Baines, head of careers and employment service, University of Hertfordshire

The complete move to virtual and all the possibilities it opens up is, perhaps, the most exciting development. If issues around access to technology are resolved, this alone may make a significant difference to students from underrepresented backgrounds, opening up access to opportunities that were previously limited by geographical location, whether through prohibitive travel costs for students or location-limiting choices made by employers.

"For those organisations that are so set on recruiting at a core group of schools, does that make sense anymore? Now you're operating in a predominantly online environment, why would you just go to the Ivy Leagues? Why not consider this engineering school? Or maybe this Hispanic-serving institution or this historically black college or university? It would make sense to open that up. I hope that students who didn't have access before, perhaps because of where their university was or because it's really small or liberal arts, will have more access to employers and vice versa."

Christian Garcia, associate dean and executive director, Toppel Career Center

While, post-pandemic, the level of remote working seen during lockdown will not remain at such heights, with 49% of British workers reported working from home in early June 2020 (ONS), there is no doubt that patterns of working have changed for good.. Many organisations are unlikely to return to full office-based attendance and some will take the opportunity to reduce costs by pivoting to remote-only. Given that underrepresented students are less likely to relocate for work than their more advantaged counterparts, there is an opportunity for the shift towards remote working to open up opportunities that those students would previously have ruled out because of geography.

Opening up work experience

"The best form of inclusion that we can look at is ensuring that every student gets an opportunity to engage in real life work experience. It should not be optional. Students should be working with employers throughout their degree, working in a transdisciplinary format, engaging with people from other courses and engaging with wider society while studying. In that way students develop better links in a way that can be scaled so it doesn't rely on social capital. It shouldn't rely on a student coming to university already having the right connections to line up a job."

Rob Ingram, head of employability, Falmouth University

In the extremely challenging post-Covid labour market, the increased competition for 'graduate' jobs is likely to accentuate employers' tendency to differentiate on factors other than degree. A third of recruiters already see prior work experience and extracurriculars for graduates as a minimum requirement (High Fliers Research (2019) The Graduate Market in 2019), but these experiences are typically more widely available to students from privileged backgrounds, increasing social and income inequality.

Traditionally underrepresented students often come from schools with poor careers advice and are often less aware of which skills and experiences are valued by employers. As we've seen in the case studies above, they may also put off engaging with support structures such as careers services until the very end of their course – an experience described by one student as *"a bit like going to the dentist. I'll leave it until I'm actually in a lot of pain, and it's an absolute last resort."*

More generally, students from lower socio-economic backgrounds are less likely to join societies, take leadership roles in sport or take up internship opportunities for a variety of reasons, including financial, time constraints or the pressure of caring responsibilities.

While employers emphasise that any experience of the workplace (including, for example, part-time work in a pub or shop) is highly valuable, students may not be aware of this or have difficulty articulating the skills such work has helped them develop. There is a danger that the class of 2020, and the cohorts below them, may also find that their part-time work has become another Covid casualty, hitting not only their finances but also their future employability.

Relatively few employers provide work experience and better-connected students end up securing placements through their own networks. Engaging directly with universities that have a higher proportion of traditionally underrepresented students is also difficult as the recruitment teams are resource-constrained, so employers may end up engaging with a relatively small number of HEIs (23 on average, according to ISE survey).

In that context, it becomes important to find innovative ways of connecting with students early on in their journey. Roche, for example, provides bursaries to students at universities such as King's College London and Hertfordshire, and offers mentorship and work experience opportunities alongside financial support to help the company identify high-potential students from disadvantaged backgrounds early on.

Virtual internships, which have come to the fore during the pandemic, also provide flexibility and opportunity without the mobility issues. As we have seen in the case studies, many companies are converting in-company internships to virtual ones, which may serve to widen access. This has been seized on by Bright Network's Intern Experience UK, which is offering an unlimited number of places on three-day virtual internships over June-July 2020 with companies such as Google, Marks & Spencer, PwC and Vodafone.

Volunteering and community engagement also have a role to play and some universities are planning to extend their community engagement work and help rebuild local communities post-Covid.

Building emotional intelligence and resilience

"One of the challenges we're going to experience moving forward, and in the next 12 months in particular, with the lack of face-to-face contact, is how we build the emotional intelligence and growth mindset of students. With fewer social interactions available to students we've got to be very conscious to take them out of their comfort zone and we need to be thinking of different methods that we can come up with to provide that. We're looking at lots of different options, particularly with our employer partners, around 'real world projects', where we set students from different disciplines working on an industry-set challenge."

Martin Perfect, head of student and graduate employability, Staffordshire University

The trend towards flexible, remote, and self-employed work will require workers to demonstrate the higher emotional intelligence, better communication skills and more resilience that is needed to develop less stable (if potentially more rewarding) careers. Here, again, the threat is that students from privileged backgrounds are more likely to have the social and cultural capital to navigate these changes successfully.

However, universities are very well-placed to address these challenges and prepare growing numbers of entrants from less privileged backgrounds for the world of high-skilled, flexible and/or remote work while employers need to adapt to changing expectations of students. The changes in the structure of the market are creating new opportunities for those institutions that have the will, capacity and resources to do this.

A significant amount of career service work is already based in the curriculum

and embedded in students' courses and the social element of the university experience cannot be discounted. What does that look like if there is no on-campus delivery for, possibly a whole year? While there are challenges around replicating in an online environment, experiences that develop team-working and problem-solving skills, career services are having to consider urgently how to resolve this and find new ways forward. It could open the way for fresh thinking on how to support students in developing and articulating these skills.

"Across the sector, employability must become part of a degree rather than a separate dusty service where students go to get their CVs checked and have a nice chat to a careers advisor for half an hour. Employability must be substantively part of learning and teaching and par for the course and seen to be that way. That means engaging with employers at all levels."

Rob Ingram, head of employability, Falmouth University

Scale

One of the main challenges faced by HEIs in achieving this goal is their ability to scale employability activities across the institution and reach as many students as possible, suggesting a role for technology solutions across the spectrum of employability activities. As the University of Liverpool has already shown with its peer support system, there is a value in focusing the efforts of the most experienced staff on high-value, high-touch activities to support the students who need it most. Introducing a level of automation below the work of the peer-to-peer system, using AI, would further free up valuable staff time for one-to-one support.

"I think the change is going to be more radical than what universities are used to. I hope in some ways that it is, because I think it's time to use this as an opportunity to do things completely differently."

Shauna McCloy, head of careers and employability services, Ulster University

INSIGHT FOR STARTUPS

"For students, opportunities to meet other students from different courses and work together in groups to solve real-world problems are really valuable and a key part of any careers team's offer. How do we replicate those opportunities virtually? That is one thing that we haven't found a good solution for yet, but we're looking at it."

Emma Moore, director of careers and employability, University of Liverpool

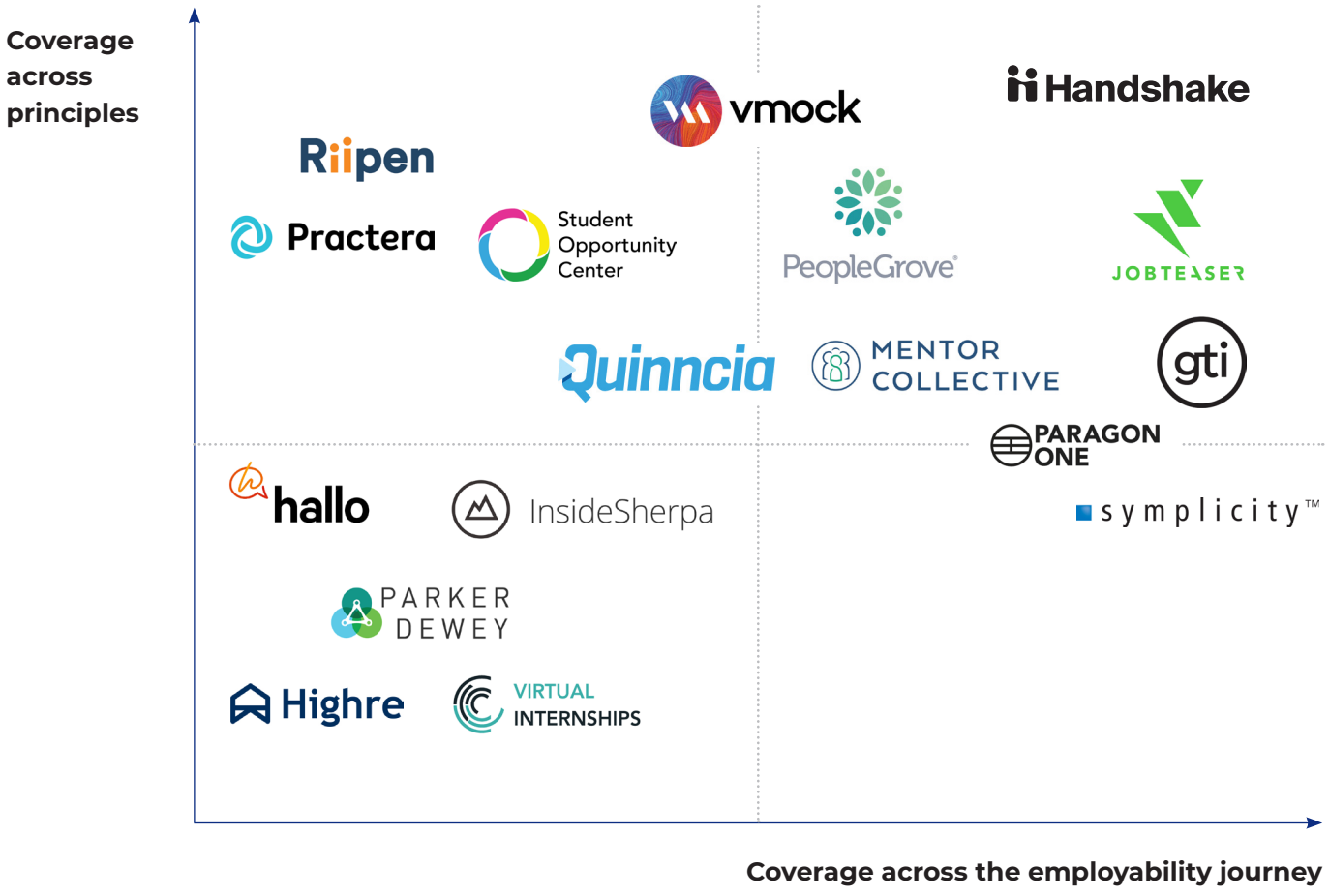
Employability journey market map

We have identified the leading startup players that are set to transform each of the key steps in the employability journey and deliver an experience that is networked, tailored and accessible.

These three principles have been reflected across the vertical axis of the map, while the horizontal axis reflects the extent to which the company provides support across the following steps in the employability journey:

- Career exploration and advice
- Work experience and experiential learning
- Job search and identification
- Job application and assessment support

Specifically, we have focused on the innovative technology providers that deliver a high-quality user experience for students and recent graduates.



Insights for startups

Observation	Implication
Careers technology has multiple end users: students, careers services staff, employers, IT teams.	Startups should consider the university and wider ecosystem as broadly as possible when designing platforms to ensure that ease of use is at the forefront for all stakeholders, not only the most obvious end users.
Universities have placed a high value on the close partnerships developed with technology suppliers during the crisis, especially the extra support they have offered to staff and students.	Startups can build better relationships with universities by understanding the pressures they experience, and continuing to offer ongoing support and provide evidence-based recommendations about how to support each student's career journey.
There is a risk of reinventing the wheel in a sub-optimal way by rushing to replicate an in-person experience on a virtual platform. This is a particular risk with large-scale events such as careers fairs.	Startups can differentiate themselves by addressing first principles. Regardless of how the physical version has always achieved that aim, how could a virtual platform approach that differently and, perhaps, more successfully by using all the affordances of technology?
Implementation and integration are consistently cited as key issues by university careers staff.	If startups work in partnership with universities to co-create solutions, it is more likely that they will be able to integrate their solution seamlessly with existing university systems and have a significant advantage.
Universities and employers both have strong reasons to improve student employability but universities face tougher budget constraints.	Startups can build better relationships with universities by setting their pricing model to reflect both relative budget size and the direct recruitment benefits that employers will realise.
UUK's June 2020 report, Supporting graduates in a Covid-19 economy, calls for the government to explore what could be done to encourage platforms such as Target Connect, Career Hub and Handshake to collaborate and share their internships between systems, so that careers services and students have access to a far wider range of opportunities.	Startups need to be aware that there is strong sector interest in greater alignment of platforms and tools and that, according to UUK, *"more could be done to join up these different platforms to enhance opportunities for students and ultimately increase enrolments onto such [internship] schemes"*.

Q+A with David Shull, head of Handshake UK and Europe

Handshake is the industry-leading early career network and career management platform connecting 950 universities, 500k employers and 17m students. It launched in the UK this year with a mission to democratise opportunity.

Can you describe Handshake's growth?

Handshake was launched in 2014, in Michigan, USA, with five university partners. In five years it has grown to support more than 950 universities in the UK and US, becoming the fastest growing education technology company in history and the experts in what it actually takes to transition universities at scale.

What role did Handshake's approach to implementation play in enabling or slowing that growth?

We've had to reimagine what the implementation process looks like to enable our growth. One of the first interactions I had with a director of a career centre in the United States revealed how important it is. She was really impressed by the tool but added "honestly, I'd rather retire than switch systems." For young founders that was certainly hard to hear, but it instilled in us the understanding that if we wanted to grow quickly then we had to make implementation easy. That fed into our strategy from day one.

What are some of the common pitfalls that make implementations particularly challenging for universities?

We realised that a lot of the cognitive load that came with switching was because career services and IT didn't speak the same language. IT teams often struggled to understand exactly what was required to transition systems because there was limited, or hard to find, documentation.
We also realised that some parts of implementation were consistently time consuming for universities, like setting up single sign on.

How does Handshake make implementation easy for universities?

To make something easy you need to understand what makes it hard. There will always be some things you can't change but there is a surprising amount you do have control over as a technology company.

Firstly, there's documentation. It sounds very basic, but it's amazing to me how few startups in the edtech space have robust and public technical documentation. We invest in great documentation that makes it very clear what is (and is not) required from IT to launch Handshake.

We've also eschewed flashy for practical. Every university says it wants an API. APIs are great when it's critical to have a real-time data exchange, but they also require a programmer, which are scarce commodities at most universities. What can every university do relatively easily? Automate the uploading of a CSV file from their student information system to another platform. We've taken that approach as it drastically reduces the load for the IT teams and in most cases a 24-hour delay in information exchange is trivial for our users.

We've also invested in tooling. We've built an in-house tool that allows IT teams to set up and test single sign on on their own without our involvement. That can save months in back and forth. Setting up single sign on with Handshake now takes most IT teams less than an hour. We also built a tool called the Importer which gives universities instant feedback on their data feed, speeding up the development process dramatically.

Finally, and where we're most contrarian, is around customisation. Everybody is obsessed with the idea of customisation without understanding its shadow. Every customisation results in a decision the university must make during implementation. Every decision results in a conversation, analysis and trade offs – adding weeks, if not months, to the actual implementation process. So we decided from the beginning that we are only going to introduce customisation where it's absolutely necessary.

We've drastically simplified the whole approach. We build tools for IT, not just for the end users. We create straightforward documentation and approaches that align with what the university can do easily, and we avoid unnecessary customisation. We now support 950+ universities with an average implementation time of eight weeks, so we think that shows it's worked pretty well.

What advice do you have for other start-ups trying to make it easy for universities to launch their technology?

A lot of the time, startups focus on building tools for their end user. They miss the fact that they also need to put the same amount of attention and detail into making it easy for other university stakeholders. Everybody thinks universities are slow and lack innovation. The reality is, technology companies have failed to make it an easy experience to transition systems.

Many companies make money charging the university for consultants to support a lengthy and complex implementation period – don't do that. It creates misaligned incentives that may generate revenue in the short-term but will result in much slower adoption in the long run. For startups to grow quickly, they need to make their product as out-of-the-box as they possibly can, and reduce the number of different decisions that govern implementation.

Acknowledgements

Emerge Education, Universities UK and Jisc would like to thank all the contributors to this report for their time and expert insight. In particular, we would like to thank the members of the Emerge Education and Universities UK advisory board on democratising the future of work, led by Quintin McKellar, and everyone who so kindly spared the time to be interviewed for a case study during an exceptionally busy time for all involved in higher education. Thank you.

Andrew Armes, UK head of talent acquisition, **Roche**
Marie Artim, vice president – Talent Acquisition, **Enterprise Rent-A-Car**
Judith Baines, head of careers and employment service, **University of Hertfordshire**
Tom Banham, director of employability and careers, **University of York**
Liz Barnes, vice-chancellor, **Staffordshire University**
Luke Baxter, VP enterprise product, marketing & insights, **Handshake**
Ann Carlisle, vice-chancellor, **Falmouth University**
Helen Cooke, director, **MyPlus Consulting**
Eva Crossan Jory, vice-president (Welfare), **NUS**
Mary Curnock Cook, OBE
Louise Farrar, director of student recruitment, **PWC**
Gi Fernando, board member, **iDEA**, and founder, **Freeformers**
Graham Galbraith, vice-chancellor, **University of Portsmouth**
Christian Garcia, associate dean and executive director, Toppel Career Center, **University of Miami**
Rebecca Garrod-Waters, CEO, **UFI Charitable Trust**
Ashley Hever, Talent acquisition director, **Enterprise Rent-A-Car**
Tristram Hooley, chief research officer, **Institute of Student Employers**
Rob Ingram, head of employability, **Falmouth University**
Kerensa Jennings, digital impact director, **BT**
Libby Jones, HR director, **John Lewis Partnership**
Sunil Malik, HR director – Europe, **Apple**
Shauna McCloy, head of careers and employability services, **Ulster University**
Quintin McKellar, vice-chancellor, **University of Hertfordshire**
Emma Moore, director of careers and employability, **University of Liverpool**
Martin Perfect, head of student and graduate employability, **Staffordshire University**
David Shull, head of **Handshake UK**
Amanda Timberg, head of talent and outreach programmes – EMEA, **Google**
Joe Voelcker, global head of early talent acquisition, **GSK**
Greg Wade, policy manager, **Universities UK**

Thank you to report sponsor, **Handshake**

The content of this report is independent of any particular solution provider.

Authors and editorial team

Alexander Iosad, head of engagement, Emerge Education
Michelle Pauli, Michelle Pauli Editorial

About Emerge

Emerge Education is a European seed fund investing in exceptional 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 founders/investors of Trilogy and 2u. The team has a solid track record with 50+ investments, with those companies raising £100m+ from investors such as Local Globe, Stride, Project A, Rethink Education, Learn Capital and Reach Capital. Emerge also convenes Edge, a series of thought leadership forums for higher education and corporate leaders working on addressing the skills gap in their organisations and beyond. Through Edge, Emerge is able to help founders gain unique customer insights and build defining business partnerships that help their companiesgrow faster.

About UUK

Universities UK is the voice of universities, helping to maintain the world-leading strength of the UK university sector and supporting our members to achieve their aims and objectives.

info@universitiesuk.ac.uk
universitiesuk.ac.uk

About Jisc

Jisc is a not-for-profit providing the UK's national research and education network (NREN) Janet, and technology solutions for its members – colleges, universities and research organisations. It is funded by the UK higher and further education and research funding bodies and member institutions.

Emerge Education
15 Fetter Lane
London
EC4A 1BW

info@emerge.education
emerge.education
@emergelab

Jisc
4 Portwall Lane
Bristol
BS1 6NB

info@jisc.ac.uk
jisc.ac.uk
@Jisc

June 2020