Insights 2022

Ufi Project: AmplifyFE

Project Team and contributors

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Date	*September 2022*
Key Findings	*https://amplifyfe.alt.ac.uk/research/*
Report	*https://amplifyfe.alt.ac.uk/research/*
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Insights 2022

Executive Summary

Our research offers insights into how we can best develop and deploy learning technology to support the vocational adult learners most impacted by the digital divide as they build the skills essential for life, work and future learning.

Over a period of six months our researchers carried out 1-1 interviews with key design project staff and members of communities who have developed or leveraged learning technology and digital tools for vocational learners; examined project outputs and reports from successful, established projects and explored the perspectives of learning technology design teams, the educators and employers deploying the technology and the learner end-users.

A rich variety of organisations and communities work in learning technology innovation. They work in challenging, diverse, highly contextualised scenarios disrupted by sector instability and ongoing COVID-19 impacts. While commercial entities have developed business and market acumen, vocational education sector-based project teams benefit from direct access to learners and high awareness of their needs. Mature sector-based projects have opportunities to leverage both of these advantages.

- **A 'learner-centred, co-design model' for innovation is most effective:** a notable research outcome is the degree of consensus on key learning technology design and deployment success factors emerging from dialogues, reports and artefacts. Regardless of the project team type and vocational scenario a 'learner-centred, co-design model' for innovation is most effective. The learner community's needs and purposes must lead innovation and inform digital

pedagogy, rather than use of 'technology for technology's sake'. Innovation is most effective when designed in close collaboration with end-user communities using extensive prototyping and feedback.

- **All learning designs should have accessibility and inclusivity as core considerations**: Consistency in look and flow of learning experience aids familiarity and builds learner confidence as well as making designs more easily adaptable and scalable. Regular, meaningful rewards and recognition should be given to ensure learner motivation remains high. Opportunities to build valuable soft skills and metacognitive abilities alongside vocational skills should be leveraged.
- **Key factors for successful innovation:** A number of 'pivotal factors' impact vocational learner end-users' engagement and motivation to adopt technology: Learning designers and the educators deploying technology need to:
    - open digital access doors and provide timely support;
    - build confidence and motivation by establishing the direct relevance of technology to learners' work and life;
    - help learners to further develop digital identity, networks and skill sets.
- **Adult vocational learners need to build digital confidence as well as competence:** Adult learners have many demands on their time so need a compelling purpose to invest time engaging with learning technology. Bite-sized learning with immediate 'wins' and rewards directly relevant to their work and wider life are essential.

This report opens up insights into how leaders imagine the 'ideal innovation project' and what makes it work in practice. We explore the role of vocational educators as key change agents not only in the building of vocational skills but also in the engagement of adults with the learning technology which drives and supports skills building. We examine how 'glimpses of the possible' can support teachers by demonstrating the tangible, vocationally authentic benefits of technology use is key for enthusiastic technology adoption.

Successful design and deployment of learning technology for vocational learners, as our research highlights, involves articulating a passionate vision for the project to all stakeholders, engendering critical curiosity in the design team, putting the learners' needs at the centre of a co-design process then engaging with vocational educators and their supporters to empower them to 'glimpse the possible'.

Introduction

This report explores how we can develop and deploy learning technology effectively to best support vocational adult learners most impacted by the digital divide. The work is based on the findings of a 6-month research investigation into 'what works?' and what challenges and development needs remain regarding the use of technology to support adult learners to build vocational skills.

The research is based on theory and good practice identified in established programmes developing the digital and workplace skills of post-16 learners and the educators working with them. Programmes investigated include Ufi funded projects, DfE/ETF programmes, Jisc initiatives and work done by sector-based independent commercial entities. The work also draws upon widely used digital skills, pedagogy and design competency frameworks to align industry insights with best current practice.

The work draws on perspectives of vocational learners, educators and their supporters, project teams developing digital skills programmes and technology enhanced learning solutions and those supporting and funding them. It considers design principles and constraints, digital skills and pedagogy, and importantly, the human aspects of vocational skills development.

The research findings are divided into sections which examine the scenarios in which adult and vocational learning occurs, outline useful digital frameworks for educators and learning technologists and investigate successes and challenges encountered by recent significant vocational skills development projects. It closes by making some recommendations for future learning technology project work in this area.

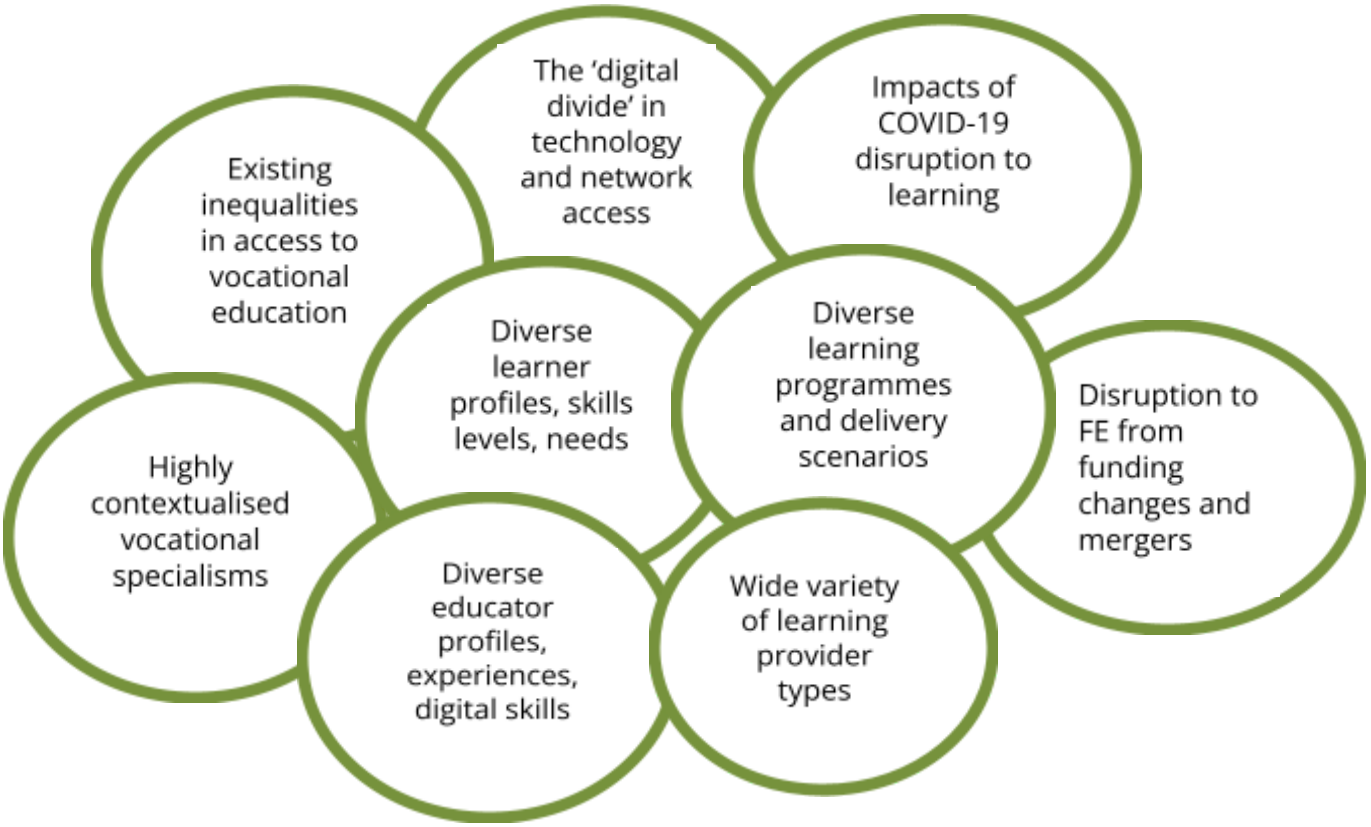
Vocational education challenges in context

What we learned:

Vocational learning technology designers and deployers work in challenging, diverse, highly contextualised scenarios further disrupted by sector instability and ongoing COVID-19 impacts.

The challenges of developing and deploying vocational learning technology to build the skills adult learners require for work, learning and wider life are bound up in the successful development of digital pedagogies and skills of those teaching in vocational education, in the workplace and in community settings. Digital development challenges are complex as they are situated in a post-16 education sector with diversity in its DNA.

Learning designers and deployers of technology work in a problematic, challenging climate and must be mindful of the rich contexts in which vocational learning occurs, the needs and profiles of the learners engaging in it and the education professionals driving it. Challenge factors at play in vocational education include:



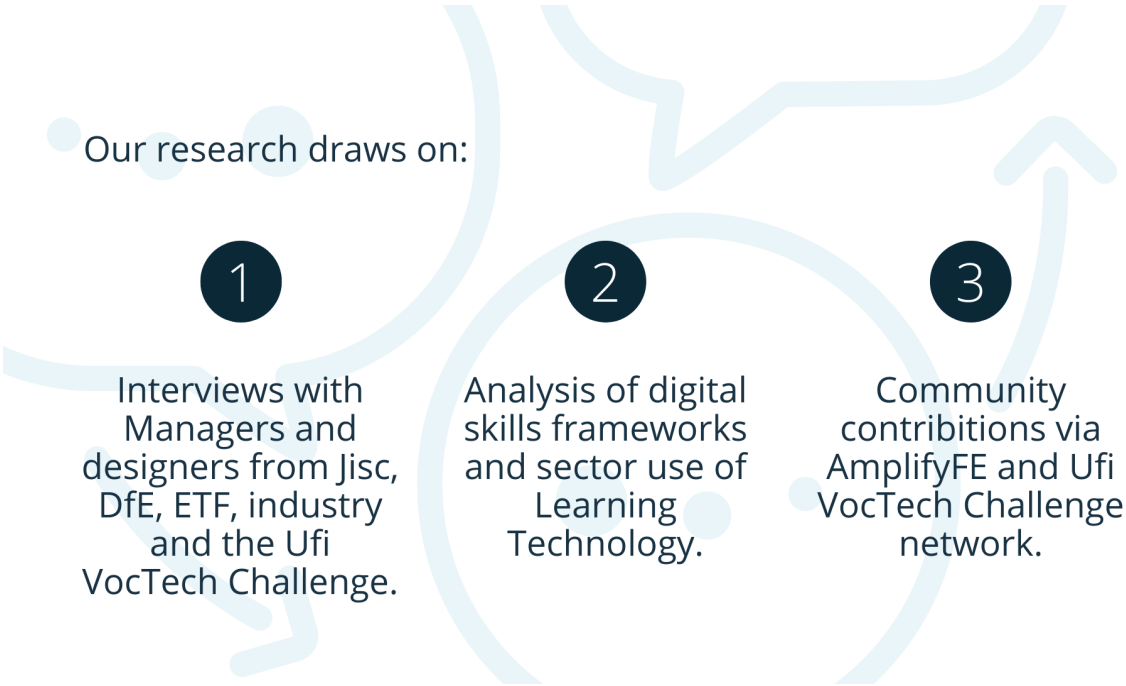
A wider consideration of the vocational education landscape expanding on factors outlined above and linked to wider literature can be found in **Appendix 1: Mapping the Challenging Landscape of Learning Technology Design and Deployment'.**

Overview of research methodology

The research is underpinned by a number of recognised frameworks and models for developing digital skills in individuals and digital capability in organisations. The models that are drawn upon in chapter 3 (the review of digital skills frameworks) span global frameworks (WEF), European frameworks (EC/EU) and UK based frameworks (Ufi, ALT, Jisc, DfE, ETF/SET, OU and HEA). The frameworks encompass the building of digital capability in organisations, developing sector educators' digital skills and pedagogy and, most importantly of all, development of adult learners' skills and capabilities.

Consultation of these frameworks gives us a powerful insight into the digital skills and vocational capabilities that are required for the modern workplace, how vocational sector educators can develop the skills in pedagogy and technology required to best support learners and how organisations developing learning technology and tools can foster digital innovation and creativity.

Once we have examined the desirable skills landscape, it's valuable to examine if and how these frameworks are being currently enacted in practice. By consulting a range of stakeholders currently involved in learning technology development and deployment we can establish 'what works?' and what the greatest challenges are to vocational learning technology development and deployment.



There are a number of established projects and communities which have developed or leveraged learning technology and digital tools and networks in vocational and lifelong learning for adults.

We examined their ethos, lifecycle, processes, products and outcomes and what challenges and gaps remain regarding skills development engaging with the following

key stakeholders: Learners using digital technology in vocational learning and training; Educators deploying digital technology; Learning and Project Designers.

- In-depth, semi-structured, 1-1 interviews were held in-person or via webinar platform with stakeholders from organisations with extensive experience in design and deployment of vocational learning technology. These included project directors, product designers and educator end-users of learning technologies. Individuals were asked to imagine the advice they would give for new teams starting out on learning technology development and deployment and for more mature teams looking to expand work done in these areas.
- Artefacts including formal project evaluation reports, journal articles, blogs and reflections from the above project teams and participants were analysed to supplement the in-person interviews and discussions
- Participants joining the *#AmplifyFE Community Space*, an online community for vocational practitioners using learning technology, developed from a strategic partnership between Ufi and ALT, were asked to contribute their ideas on learning technology development and deployment. This consultation was performed in small focus groups in online breakout rooms during AmplifyFE Community meetings and captured using discussion transcripts and via contributions to online discussion boards (Padlet and Google Jamboard).

Skills for vocational learners and educators

What we learned:

Robust frameworks exist for vocational learners, educators, learning designers and learning providers to identify key skills portfolios for the modern workplace.

These have commonalities centred around:

- **Selecting and using digital devices and networks**
- **Managing and presenting information**
- **Communicating and collaborating**
- **Working ethically, lawfully and inclusively**
- **Managing personal and professional digital identity and wellbeing.**

Before we begin to evaluate 'what works?' regarding development and deployment of digital tools and vocational learning technology and where the gaps and barriers still remain, it's important to interrogate 'what's needed?' in a contemporary vocational digital skills portfolio.

A full discussion of relevant digital skills, digital pedagogy and wider workplace skills and outlines of the skills frameworks, models and papers which inform this research can be found in **Appendix 2 'Digital skills and Pedagogy Frameworks Underpinning the Research'.** The Appendix summarises frameworks and papers from ALT, DfE, ETF/SET, EU/EC, OU, HEA and Ufi

Common themes which emerge when interrogating these documents are the need for vocational learners, educators and learning providers to:

Underpinning these core skills are abilities to analyse and solve problems, to have the confidence to experiment with and master new digital tools and networks and the reflective ability of learners to evaluate their own performance and plan and action further development.

Armed with these frameworks for general vocation skills and specific digital skills development, this research examines programmes which have sought as a whole, or in part to develop vocational skills using learning technology and digital tools and networks. The next chapter seeks to do this by investigating 'what works' in recent and current vocational skills development and deployment programmes.

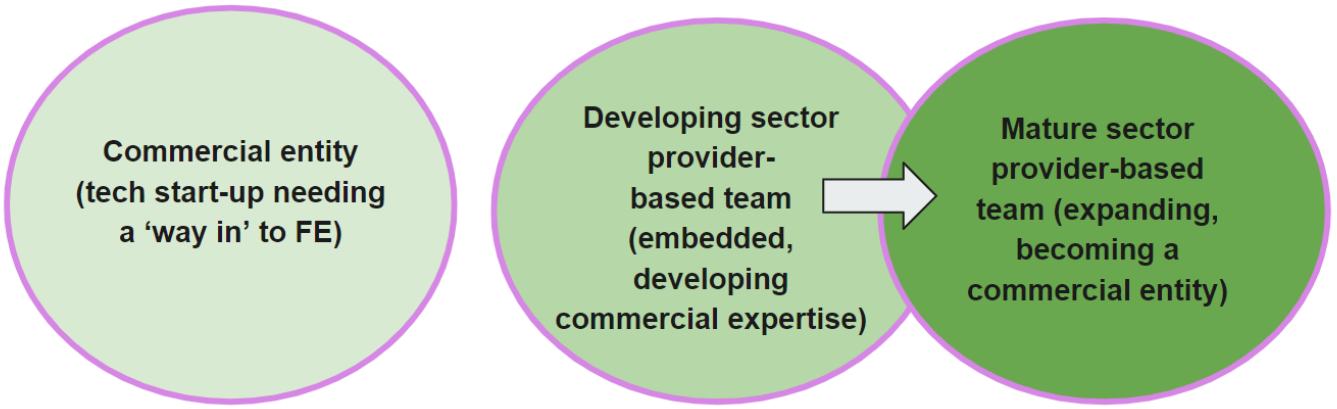
Findings from the research 1: Designing to meet learners' needs

Profiles of innovative learning technology projects

What we learned:

Diverse organisations work in learning technology innovation. Commercial entities have developed business and market acumen, sector-based project teams benefit from direct access to learners and high awareness of their needs. Mature sector-based projects may leverage both of these advantages.

Before interrogating the systems and processes which have powered successful vocational technology developments it is interesting to note the profiles of project teams working on innovations in this area. These fall into 3 categories:



Three significant project team types exist, each having certain advantages and challenges not experienced by others. Mature commercial entities may be likely to have more expertise in innovation in the business environment with respect to finance, marketing and broader business-based team skills and have a tight focus on the project. Sector provider-based teams, however, are likely to have current, direct experience and expertise of working with vocational learners and educators and easier access to end-user groups for research, prototyping and feedback. While commercial entities may find obtaining access to vocational learners and educators more challenging, sector teams are likely to find innovation development can take second priority to immediate curriculum management needs.

Mature sector-based teams can have 'best of both worlds' positioning with direct learner and educator access, immediate experience of vocational sector needs and more developed business experience, especially after several innovation cycles.

The learner-centred community model of innovation

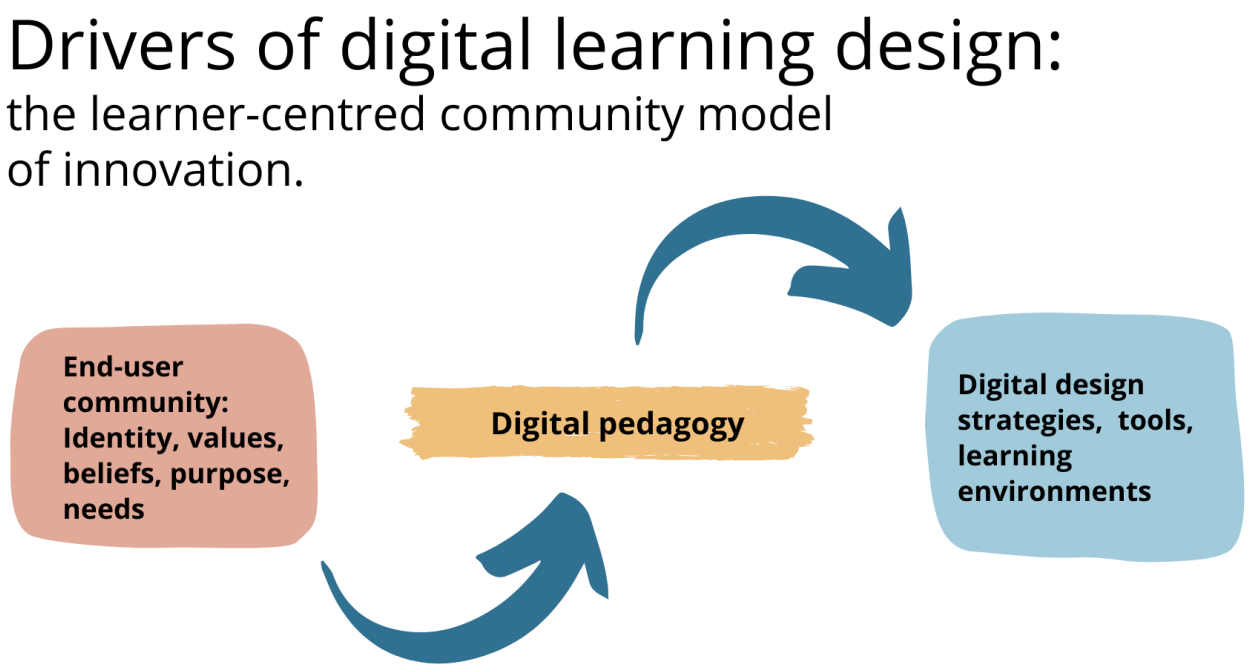
What we learned:

A 'learner-centred, co-design model' for innovation is most effective.

The learner community's needs and purposes lead innovation and inform digital pedagogy, rather than use of 'technology for technology's sake'.

Innovation is most effective when designed in close collaboration with end-user communities using extensive prototyping and feedback.

There is strong agreement from the design teams, educators, project artefacts and literature that a 'learner-centred, co-design model of innovation' is the preferred and most successful model.



Interviewees concurred that innovation design should be end-user community led rather than allowing digital tools and learning technology to steer the process. The end-user community's identity, values, beliefs and needs must be paramount and the design focussed on meeting their core purpose. Learner need informs the digital pedagogies that are employed which, in turn, inform the innovation design strategy.

The most successful project teams contributing to this research spent significant time and resources researching the end-users' identity, needs and purposes for learning before beginning the design process and consulted the community widely on their user experiences with the innovations during prototyping.

An analysis of the technology designers' research on users' needs and purposes revealed significant, pivotal factors which engage, motivate and support adult vocational learners.

Pivotal factors empowering digitally-powered skills development

What we learned:

Key, 'pivotal factors' impact learner engagement and motivation with technology.

Vocational learning designers and educators need to open digital access doors providing timely support, build confidence and motivation by establishing direct relevance of technology to work and life, then help learners' further develop digital identity, networks and skillsets.

Learning technology designers and deployers tell us that the pivotal factors empowering skills development for vocational adult learners can be summarised as:

Expanding each of these pivotal factors reveals the detail behind the drivers. Each has been cross-referenced to an appropriate skills framework as outlined in the section 'Skills for vocational learners and educators' and significant literature in this area.

Pivotal factor 1: Open doors

Opening doors to technology-powered vocational learning involves ensuring suitable access, providing appropriate, timely support and giving adults sufficient opportunities to experiment with the tools to appreciate their relevance, to 'make them their own':

Access	Support	Opportunity
Convenient, affordable, accessible digital networks, tools and devices with appropriate user accounts. Optimum online/ offline learning blend	Appropriate, timely, targeted support. Trusted communities of mentors, peers and workplace support	Adequate time and space to experiment, to discover personal relevance, the life and work areas where digital tools will be useful and valued.
Jisc (2017)	Mycroft (2018)	Jisc (2022)

Pivotal factor 2: Growth spaces

As doors open to the power and value of digital learning, appropriate spaces must be provided where learners can build self-confidence and resilience and appreciate how life-changing technology mastery can be. Importantly we must empower adults to safeguard their wellbeing while they grow digital acumen and develop online networks:

Confidence	Relevance	Wellbeing
Building confidence and resilience - the 'persistence' to 'have a go' requires courage. Needs trust to be built with supporters, 'quick wins' and motivating rewards	Appreciation of the relevance of technology - how it changes life and work opportunities and path. WIIFM? A glimpse of 'the possible'	Awareness of potential challenges to wellbeing, safeguarding and privacy. Ethical use. Becoming an aware, informed user of technology.
Mycroft (2018)	ETF, DTPF (2018)	ALT (2021)

Pivotal factor 3: Clear purpose for digital use

As confidence is built and relevance of skills established, a final pivotal factor powering continuing growth and capacity for future learning is a clear forward purpose to repay investment of time and effort. This centres around professional network building, growth of generic and specialist skillsets and development of a wider awareness of how future skills development benefits work and wider life prospects:

Identity	Skillset	Awareness
Purposeful building of personal and professional digital identity and persona. Professional network development	Development of generic and vocational specialist digital skills Techno-mathematical literacies for work and life skills development	Continued growth in awareness of how digital fluency impacts work and life prospects and progression.
(OU, 2022)	ETF (2022)	DfE (2019)

Creating the conditions for digitally-powered vocational learning

What we learned:

Adult vocational learners need to build confidence levels alongside skillsets.

They have many demands on their time so need a compelling purpose to invest time engaging with learning technology.

Bite-sized learning with immediate 'wins' and rewards directly relevant to their work and wider life are essential along with timely, motivational support.

Adult, vocational learners have specific learning needs over and above students in school-based, compulsory education, particularly when developing technology-enabled skills. Many may enter vocational learning bringing past negative experiences in education and training from school or the workplace. Adults are also likely to be time-poor due to family, caring and work commitments and many can lack the support networks required for thriving in vocational learning or developing digital skills.

A lack of confidence with digital tools and networks and low motivation to engage with their use can be barriers to engagement as significant as a lower skills base. Assuming prior knowledge around the use of digital tools and terminology or using 'school-style', infantilising learning scenarios compounds adult learners' reticence to engage.

Designers and deployers of vocational learning innovations pinpointed key success factors to foster confidence and motivation in adult vocational learners:

Designers and deployers of learning technology need to build both learners' confidence and motivation with 'quick wins', selling the immediate value of investing the time and effort required to experiment with and master technology. This can be achieved by using bite-sized learning with valued rewards and by promoting case studies of similar learners' past success. Key to ensuring engagement is the building of skills with immediate use, impact and value for work and wider life. Authentic life and workplace tasks such as building a CV, household budgeting or purchasing better value shopping or travel and leisure tickets are compelling motivators.

It is also vital that adult learners are provided with timely, appropriate learning support when required. A significant part of this is determining the optimum online-offline mix of training and mentoring that best suits each learner. Investigating journeys of learners who failed to engage with vocational learning technology or who did not complete a course of study give designers valuable insights into where refinements in future learning offers need to be made.

Correctly identifying end-users' needs: robust problem definitions

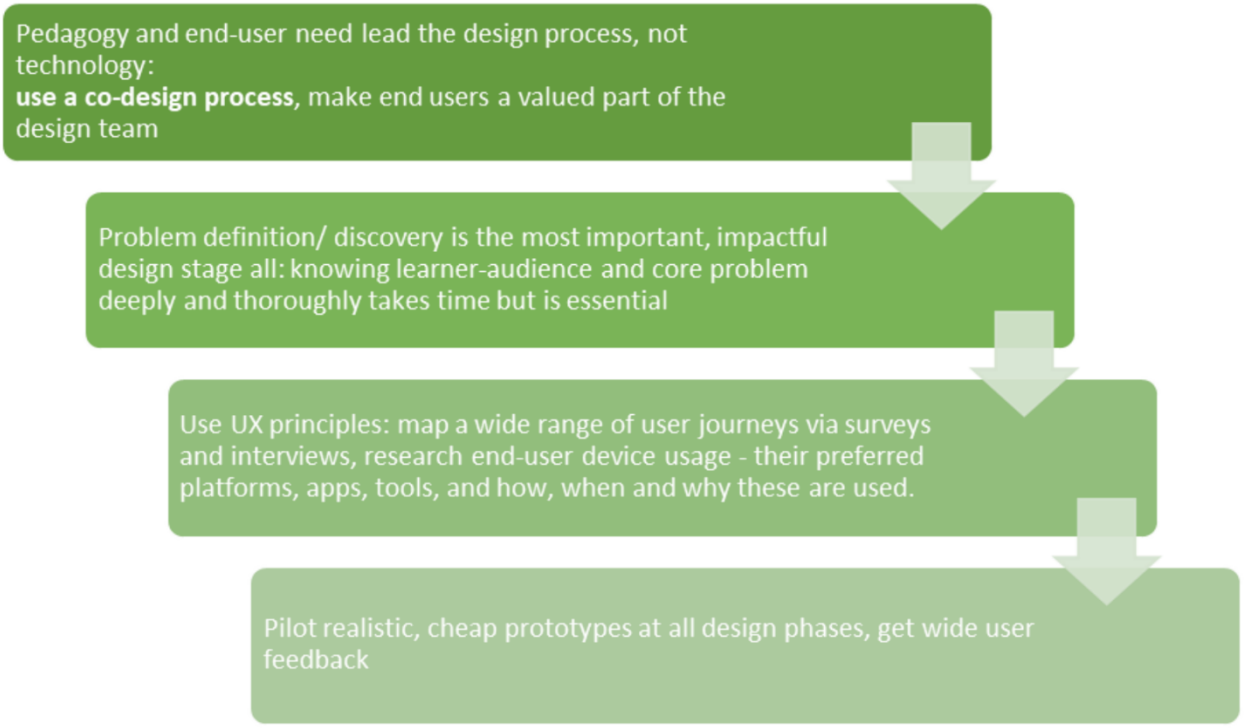
What we learned:

Innovations stemming from a co-design process with end users, closely involving them at every design stage are most successful. It is vital to have a robust definition of the problem to be solved or need to be met. Mapping a wide range of learner journeys, clearly establishing users' needs and undertaking extensive, realistic prototyping at all design stages are key parts of this co-design process.

A clear, consistent message coming from the designers and deployers of vocational learning technology is the need for a robust, methodical problem definition phase. They tell us that though this is the most important phase of the project, it can be minimised or given insufficient focus due to an understandable desire to 'get on with' designing an exciting innovation. The message that innovation projects succeed or fail based on the depth and scope of research into users' needs and end-user' experience (UX) with technology could not have been clearer.

A key message is that the most successful way to ensure that an innovation will meet users' needs is to involve users deeply in a co-design process where they are invited to lead and consulted for development suggestions at every stage of the design process. Co-design involves engaging a wide range of end users as a valued part of the design team right from the outset. Only by mapping diverse learner journeys and experiences, prototyping at every design stage with realistic simulations and gathering and considering the widest range of user feedback can the design be fit for purpose.

The other key element underpinning initial design considerations is robust pedagogy, ensuring that learning designs employ sound principles regarding learning path, resources, support, motivation, assessment of progress and reward.



Ensuring vocational learning innovations meet end-users' needs

What we learned:

All learning designs should have accessibility and inclusivity as core considerations.

Consistency in look and flow of learning experience aids familiarity and builds confidence as well as making designs more easily adaptable and scalable.

Opportunities to build soft and metacognitive skills should be leveraged and regular rewards and recognition given to ensure motivation remains high

Emerging from robust problem definition and user needs investigations across diverse innovation projects, there are clear and consistent messages coming from learning designers and deployers regarding design strategies most successful with adult vocational learners.

Accessibility and inclusion should be essential, core parts of the design process from the outset. A mixed media, dual-coding approach blending images, video, audio and overlaid text will be engaging for users, accessible for the widest possible audience and aid in clarifying key principles and demystifying jargon. All designs should reflect a wide

range of user types in terms of images, voices and learning scenarios including a mix of ages, ethnic backgrounds, regional accents, abilities and family, work and social scenarios enabling all learners to feel represented.

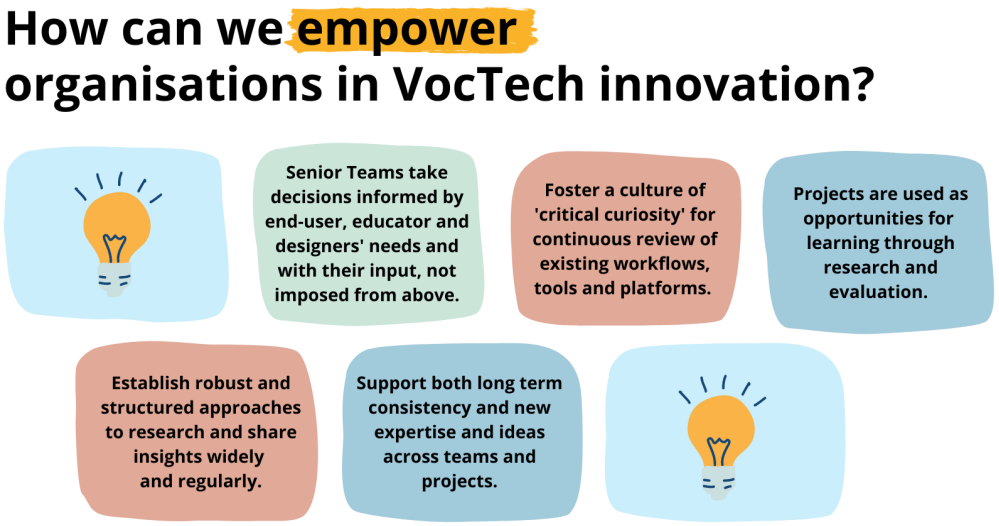
A consistent look, feel and flow between elements of the learning experience is important as this familiarity helps to build learner confidence. This strategy has the added benefit that a consistent, modular design will be more easily adaptable and scalable for different audiences and larger user numbers in future. Providing users with choices of path and pace of learning and options on context and scenarios also improves engagement.

Giving regular recognition and reward for progress, for example via digital badges or downloadable achievement certificates is also a significant motivational driver.

Finally, it is important to build 'value added' soft skills and metacognitive abilities in parallel to core vocational knowledge. This encourages learners to develop communication skills and collaborative capabilities and be able to reflect on how to improve their own future learning, to 'learn how to learn' more successfully.

Findings from the research 2: Managing projects, growing innovation

Another important part of this research was engaging with vocational learning technology project directors and managers to discover the key elements of building, sustaining and growing innovation teams. Those involved in senior roles in innovation pinpointed key messages for those leading innovation in this area.



Key drivers of innovation in organisations

What we learned:

As well as 'givens' such as well-planned schedules and budgets, the ideal innovation project has important key features in place from the outset:

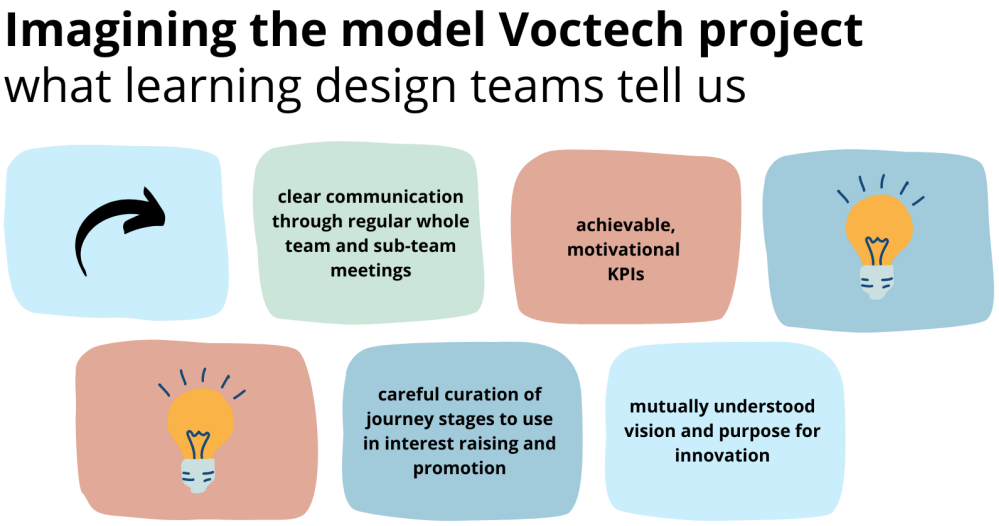
- **Passionate articulation of 'the vision', scope and values of the project to all involved**
- **Support for critical curiosity – each project is a valuable opportunity for designers to conduct research on organisational innovation processes and drivers**
- **Clear lines of communication and feedback in-team, and an open dialogue culture with end-user co-designers, funders, supporters and other stakeholders**
- **Persuasive promotion via curation and dissemination of 'work in progress' such as prototype outlines or reflections from the project team from the outset.**

Project directors, designers, and indeed team members, tell us that the key levers powering technology innovation in organisations are cultural rather than operational. Chief amongst these is ensuring that design teams apply critical curiosity to the creative process as well as to the learning technology products they create.

Team members must be encouraged to consider every project an opportunity to research the organisation's innovation processes and reflect upon how they can develop. This requires a formal, recognised and robust research methodology with findings shared widely among team members and across the wider organisation.

For an organisational research culture to thrive there needs to be longevity within teams allowing longitudinal studies of creative processes to be performed. Consistency in key team members should be interleaved with new personnel from inside and outside the organisation being introduced as needed to supply specialist skills and to provide fresh perspectives, creative ideas and ways of thinking and operating.

Technology innovation requires proactive support at senior levels in the organisation. Leaders should be responsive to design teams' requests for funding, personnel and resources, led by design teams regarding which technologies and tools are used rather than seeking to impose tools and working practices upon them.



Mapping 'the ideal innovation project'

A significant challenge identified by research respondents was ensuring that all essential tasks and roles for the project are planned and in place from the outset.

Getting the project off to a solid start by ensuring that the team have a commonly understood grasp of the vision and scope of the project, have shared values and beliefs and feel encouraged to be creative and curious, openly discussing their progress and challenges are essential underpinnings. Clarity on how progress will be monitored in terms of milestones and KPIs and critically reviewed and evaluated by the team is essential.

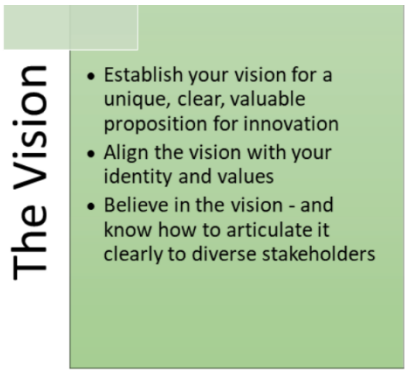
Project managers particularly highlighted the fact that certain tasks, which might be viewed as being performed 'downstream' in later stages in the project, such as product promotion, need to be planned and in place from the outset. Documenting each stage of the development journey by curating design artefacts and reflections from the team and using them to promote the project is a powerful way of arousing interest in innovations ahead of their launch. It is more difficult to gather engaging 'works in progress' after the fact, so a plan for getting the voices of the team and exciting news on progress out to a range of stakeholders at each design stage is important.

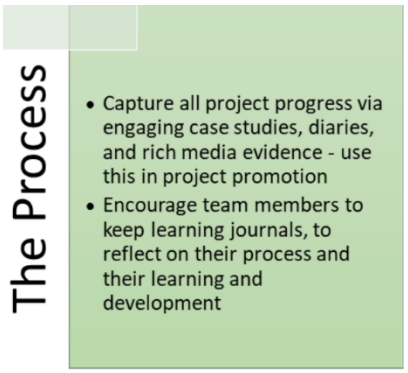
Drawing together these insights along with aspects of the project that we naturally expect to be in place provides a honeycomb vision of the 'ideal innovation project' key aspects of which are expanded on in the next section.

'The Vision': establish, articulate and promote

Aspects of projects such as finance and milestones can be drawn up and presented easily in spreadsheets and schedules. The far less tangible, yet vital, heart of the project is the vision for a unique, valuable innovation. Project managers and directors tell us that establishing and articulating this vision, along with the underpinning identity and values of the team and project, is the true engine for innovation. Belief in the vision and clear and passionate articulation of it to all stakeholders is a key success factor in learning technology projects.

This process has three stages beginning with leadership itself, growing to encompass the entire design team, then engaging stakeholders via a compelling narrative:

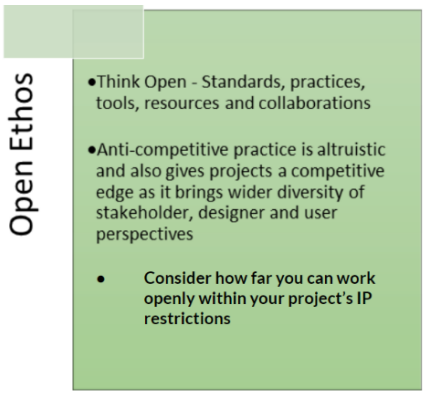


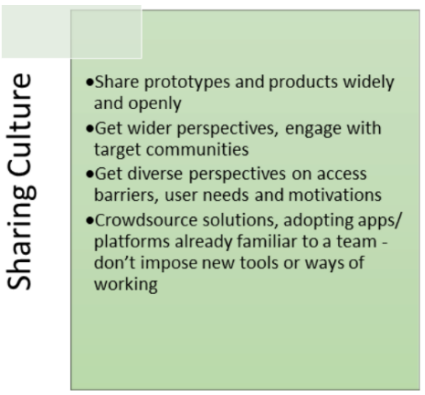


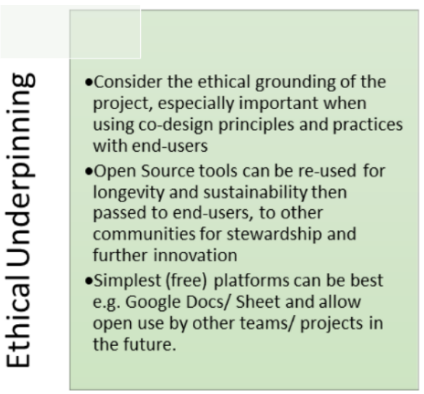
Underpinning the Vision: open culture and ethics

Any values-based vision has ethics and openness at its heart. An important part of the end-user community co-design process is considering the ethical grounding for the project and how a culture of openness can be leveraged to maximise opportunities.

This can involve collaborating with a wide range of stakeholders, crowdsourcing and openly discussing design options and direction as part of anti-competitive practice. As well as being altruistic this open ethos engages a much wider range of stakeholders and diverse opinions in the innovation process. Use of Open Source assets makes it possible for the community to re-purpose and adapt aspects of the design and design process.





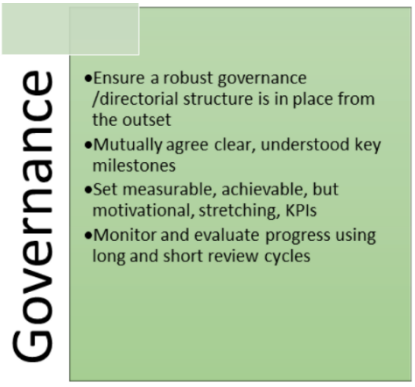


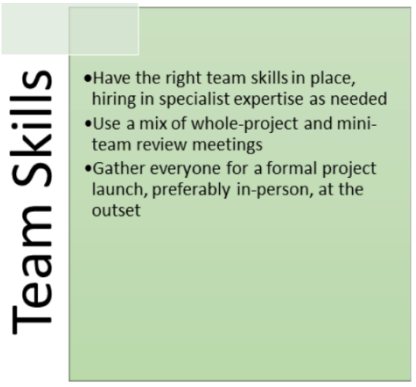
Leading the Vision: governance, team-building and partnerships

Ensuring that inward- and outward-facing aspects of the innovation process are thoroughly planned and clearly identified is the key to productive co-design. This process begins with robust governance with clearly stated and globally understood milestones, motivating but achievable KPIs and open, critical evaluation systems.

Team bonding and building is essential, ideally with initial in-person familiarisation to foster a co-operative, collaborative community. A mixture of in-house skills and external, specialist expertise provides flexible working with all team members empowered to action their own professional learning and development.

Partnership working with support networks should be in place from the outset drawing in the widest possible community. Links with industry and other commercial entities can be extremely valuable, not only in terms of funding and promotional support, but in sourcing authentic workplace assets such as industry links, resources and access to current 'live' documentation and working practices. Links with established professionals in the workplace who have progressed from FE and Skills routes and less advantaged backgrounds can be used to provide contextualised tips for vocational learners on workplace norms and etiquette.





Empowering vocational educators to embrace learning technology

The final, key piece in the jigsaw of effective leveraging of learning technology in vocational education is securing the buy-in and enthusiasm of vocational educators. Educators are work and life role models to learners and their attitudes to technology have significant impacts on the groups they work with. Vocational educators and their colleagues such as support workers, mentors and coaches can act as advocates for learning technology or conversely as gatekeepers preventing or limiting its effective use.

Those involved in promoting learning technology to and with vocational educators and developing their digital pedagogy and practice are clear about key drivers to ensure enthusiasm and motivation for its use.

What we learned:

Teachers are learners too: principles for empowering and motivating learners to adopt technology hold equally well for the educators working with them.

Technology should not be imposed upon teachers, but integrated into existing pedagogy in a coordinated manner beginning by selling its value.

Providing 'glimpses of the possible', demonstrating tangible, authentic benefits of technology use to vocational learners is key.

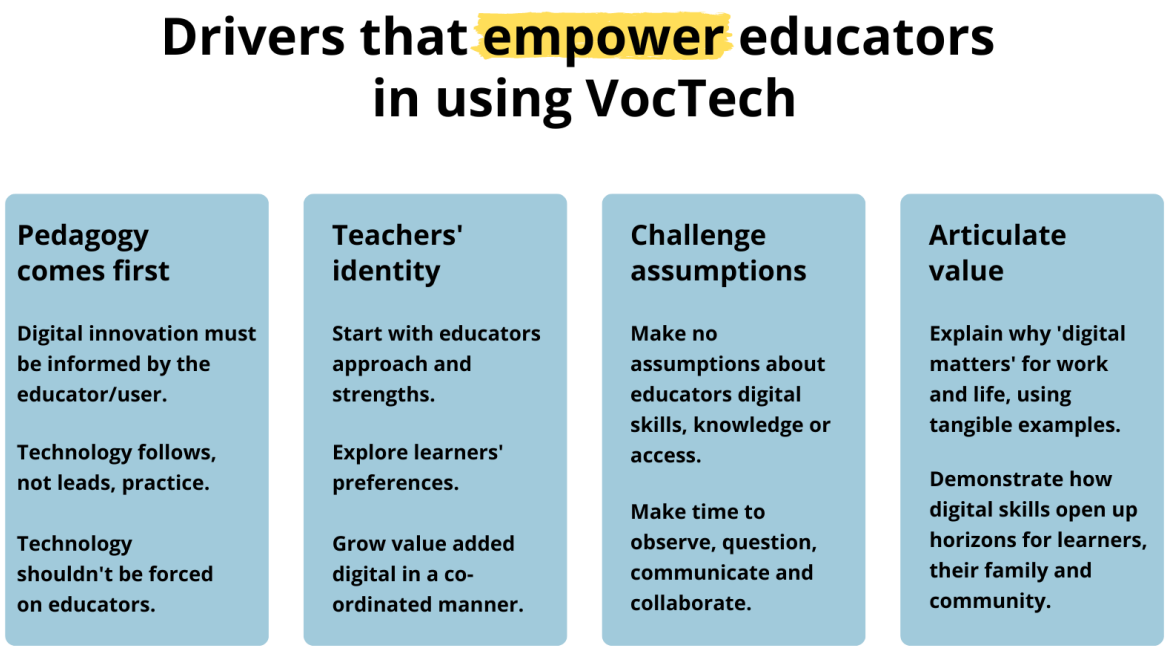
Selling the value of learning technology: pedagogy leads

Just as we should not impose technology solutions on design teams, equally we should avoid mandating specific learning technologies to vocational educators. Those working with teachers and their supporters tell us that it is key to adopt a 'pedagogy first' approach. Technology must follow, rather than lead, classroom practice, led by educators, informed by their knowledge of learner, curriculum and workplace needs.

An important starting point is to secure clarity on teachers' current pedagogy and strengths in innovative classroom practice, then introduce technology in a coordinated manner. This is a patient process requiring time to observe and question teachers about existing practice to avoid assumptions on digital knowledge, skills or access.

Once appropriate technology solutions are identified it is vital to 'sell the value' of innovation to teachers. The first step is to persuade educators that 'digital matters' and that digital skills and confidence with technology are important to all learners' life and work opportunities. This is best done with tangible, authentic examples of how specific, specialist technologies are already used in the vocational area and how ubiquitous digital tools can be used to better support and motivate learners' success.

This process can be thought of as giving teachers a 'glimpse of the world the possible' by demonstrating immediate, valuable, practical uses of technology. Dispelling myths that technology is either frivolous (in the case of platforms such as social media), too challenging to master, or not directly relevant to vocational learners is also important.

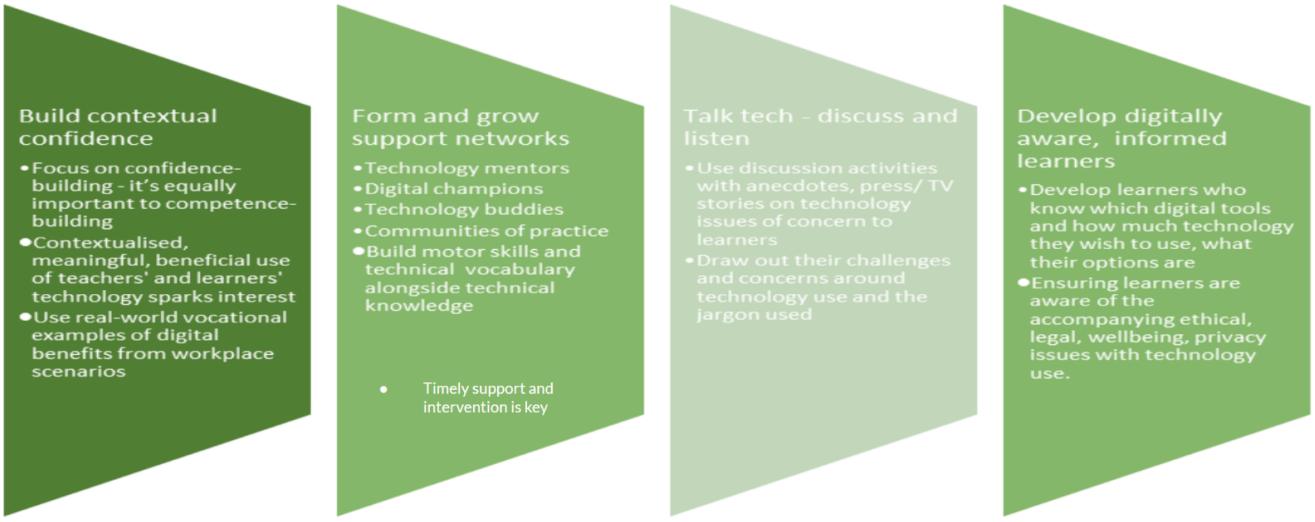


‘Teachers are learners too’

It’s important to recognise that teachers are learners too. Principles already outlined for adoption of technology by vocational learners equally hold true for developing educators, bringing us full circle in these research findings.

All learners at all careers stages need to have digital confidence as well as competence built, to have access to timely, supportive networks, have their interest sparked by relevant, contextualised usage and experience ‘quick wins’ and motivational rewards.

As well as developing the motor skills required to use technology and having a knowledge of its operation and the terminology surrounding it, it's also key to ‘talk technology’ with those mastering it. Discussions can be used to draw out assumptions, misconceptions and concerns about technology use. The aim is to develop digitally aware teachers and learners who have a sound knowledge of their options regarding technology, know its benefits, how to deploy it safely and ethically, and how it can empower the next stage of their career journey.



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Appendix One: Mapping the Challenging Landscape of Learning Technology Design and Deployment

COVID-19 is the latest disruptive influence for all teachers and learners. In vocational education it has 'exposed fault-lines of inequality' causing many more people to be at risk of exclusion from education and training and the access to employment that brings as the 'digital divide' widens. The organisational, economic and cultural influences at play in vocational education during a time of instability and flux exacerbated by COVID-19 need to be considered when we investigate what works and 'what good looks like' when developing adults' digital access and vocational and digital skills (Ufi, 2021:6).

Education past school leaving age exists in as many shapes and styles as there are learning scenarios; it is 'wide ranging and remarkably diverse' (ETF: 2020:4). What most people refer to as simply 'FE' is also termed 'vocational education', 'post-compulsory education', 'post-16 education', 'Vocational Education and Training' (VET), Further Adult and Vocational Education (FAVE) the 'Skills Sector' and 'Lifelong Learning' as well as the Government's current preferred term 'Further Education and Training' (ETF, 2020). It meets the needs of 'neglected' learners in the 50% of 18 to 30-year-olds who do not go to university as well as older non-graduates (DfE, 2019:5).

In 2021-22 over 1.2 million adult learners participated in Further Education and Skills learning, while Higher level (4 or above) intake stood at 205,400 learners, Adult Education at 578,800 and Community Learning at 173,600. These figures do not include adults undertaking unaccredited learning in the workplace, learning for leisure socially or participating in 'lifelong learning' independently using online platforms.

We can argue that all post-16 education is in some way 'vocational education'; it is important for the individual but also equally vital for their families, communities and the nation. Beneficial impacts of engagement post-16 education are improved economic and employment prospects, increased self-confidence and esteem, building of transferable skills, wider involvement in the local community, better understanding of other individuals and cultures, better skills transmission to family members, improved personal health and greater agency, wellbeing and happiness (ETF, 2020:WEA, 2017). Diversity is evidenced in the disparate, often competing organisations providing learning, encompassing large multi-campus General Further Education colleges, local and national specialist and specialist vocational colleges (including land-based and arts colleges), Local Authority and Independent Training Providers (ITPs), Adult and Community Education/Learning (ACE/ACL) provision, work-based learning (WBL) across all industry sectors, employer-led training, third sector and public (HMP) and private Offender Learning provision (ETF, 2020).

The ‘FE tapestry’ (PDNorth, 2022) of work-related learning was experiencing considerable challenge and change before the added disruption of COVID-19. Significant landscape shifts began with rapid growth in the number of ITPs and third sector organisations operating as independent commercial training entities. The current policy environment of competitive tendering mechanisms which provide and distribute funding encourages contracted-out provision, giving employers greater freedom of choice in how and where their training budgets are spent. Private expenditure grew by 85% in the ten years to 2010 (UCU 2016:4) and its growth still fosters a highly competitive climate where stakeholders can ‘work in silos, looking after their own interests rather than what is best for learners’ (Policy Consortium, 2018:53).

The mergers of over 50 smaller FE colleges into larger, multi-site entities following the Area Reviews in 2018 added to this disruptive environment pre-pandemic and change has been a ‘pervasive feature’ of FE since (DfE, 2019). The instabilities of the landscape are exacerbated not only by pandemic after-effects but also by a challenging financial environment for the sector which predated COVID-19 and still persists. Funding per student for 16-18 year-olds fell by 8% in real terms between 2010 and 2018 and funding for adult education was reduced by 45% (IfS, 2018).

The post-16 student body is also highly diverse, extending far beyond well-publicised A Level and Apprenticeship programmes. Learners engage in vocational study at Levels 1 and 2 (Level 2 being GCSE equivalent) building readiness for Apprenticeships, ‘HE in FE’ (completing Degree or Master’s programmes), undertake study of professional qualifications in a college or equivalent setting as well as benefiting from unaccredited leisure learning courses in Adult/Community Education scenarios.. Apprenticeship and Traineeship programmes were augmented in 2020 with the addition of ‘T Level’ qualifications (DfE, 2022) during a time of further uncertainty over the future of the Applied General Qualifications (such as BTECs) they were set to replace whose future remains uncertain at time of writing.

Virtuous and vicious cycles exist in vocational education and those with who already have access to it and the entry skills to leverage it are likely to progress further. Adults who had more limited educational access before the pandemic are now even less likely to participate. Only 20% of adults who left school after compulsory education engaged in learning during lockdown, versus 57% of those who stayed in education until at least age 21. Those in lower socio-economic groups were half as likely to take part in learning during lockdown than adults in higher groups, with only one third of unemployed adults participating in lockdown learning (Aldridge, Jones and Southgate, 2020). These statistics are doubtless influenced by much learning moving online during lockdown, further excluding those with low digital skills and access.

Ten million people in the UK lack the basic foundation skills needed for an increasingly digital world (Lloyds Bank, 2021) and almost 15 million show ‘very low engagement’ with digital tools. Of these ‘limited users’, certain groups are more likely to encounter access barriers to digital devices, platforms and services, software and data networks as well as

appropriate and safe study spaces to participate in education. Those with low digital engagement are four times more likely to live in low-income households, eight times more likely to be aged over 65, one-and-a-half times more likely to be from a BAME group and more likely to live outside southern England (Good Things Foundation, 2021: Hutchings and Sheppard, 2021). Hard-to-reach learners with lower digital skills will likely remain excluded as inequalities worsened by the pandemic in 2020-22 bed in (Ufi, 2021).

When considering vocational education, it is important to place special emphasis on 'teacher-learners'. Teacher learning begins during in-post initial teacher training through an Award, Certificate or Diploma in Education and Training courses or via a Certificate in Education or PGCE route. This can continue to Masters or Doctoral level or progress through 'professional formation' from the sector's professional body, the Society for Education and Training. Qualified Teacher Learning and Skills (QTLS) status or Advanced Teacher Status awards can be undertaken, the latter holding Chartered College of Teaching's Chartered Teacher (CTeach) status equivalence (SET, 2022).

Vocational teaching is not a first career for most practitioners. Only 30% of staff are under 40 years old and almost as many (29%) are aged 55 years or over, giving a mean age of 46. The proportion of teachers with Level 4 teaching qualifications continues to decline, while the proportion with Level 3 qualifications continues to increase. The proportion of teachers with QCF Level 3 or below (including those with no formal qualifications) is now almost 22% (ETF, 2020b).

Once in post, the FE workforce displays equally high diversity to vocational learners in educational and professional background, contract type and qualification level. The latest workforce data (SIR 2018-19 from GFE Colleges, Local Authorities, Independent Training and Third Sector providers, Sixth Form and Specialist Colleges) draws on provider-submitted and ESFA data. The report reveals that the majority of the 87,359 workforce are teachers, who make up 41% of sector staff, supported by student-facing technical staff comprising 16% of the workforce (ETF, 2020b).

Sector staffing remains stable numerically, but shows underlying impermanence: 4.4% of staff overall are employed on zero hours contracts with 'casual' contracts in place for over 40% of the Local Authority workforce and more than 8% of college staff. In Local Authority provision, 72% of staff work part-time, compared to 46% at colleges, 20% at independent providers and 43% at other sector providers, a proportion 20% higher on average than the UK workforce in general (ONS, 2022). The majority of permanent teaching staff have been in post in their current role for 5 years or less. The most significant staff turnover is seen in Apprenticeship provision at independent providers at a rate of over 20%, accompanied by a support staff turnover peaking at 67% (ETF, 2020b).

The Commission on Adult Vocational Teaching and Learning (CAVTL) report 'It's all about work', placed vocational education's focus firmly on improving learners' employability,

providing a ‘clear line of sight’ to work, underpinned by a ‘2-way street’ of close collaboration between providers and employers (CAVTL, 2013:4). With this aim in mind, vocational educators need to engage in career-long professional learning, developing as ‘dual professionals’ in both situated pedagogy and vocational subject specialist knowledge. Sustained, continuing development is especially vital for fast-changing areas such as digital skills and pedagogy development.

Since deregulation of the sector there is no mandated CPD hours requirement for vocational educators, though an ‘expectation’ of at least 30 hours per year remains. Despite this, almost a third of teachers spent fewer than 30 hours on CPD in 2018-19, a rise of 7% in three years. The proportion of teachers reporting fewer than 20 annual CPD hours has increased from 16% to 25% (ETF, 2020b).

Vocational education’s highly contextualised, specialist learning scenarios and diverse learner groups make vocational teachers’ learning particularly unsuitable for one-size-fits-all, bite-sized, teacher CPD ‘event-based’ approaches (Taylerson in Gregson and Spedding, 2020:165) both in terms of generalised and subject- specific digital pedagogy. How can we develop a vocational teaching workforce with the skills required to fit learners for today’s workplace and digital skills needs? What digital learning do vocational teachers and their learners need? The next topic addresses these challenges by examining digital skills and digital pedagogy frameworks for vocational learning and technology-enabled learning design.

Appendix Two: Digital skills and Pedagogy Frameworks Underpinning the Research

The shortage of work-related skills is a global challenge, not just one restricted to the UK. The World Economic Forum (WEF) estimates that 50% of all employees will require retraining by 2025 and expect 40% of current core skills to have changed by that time (WEF, 2021a:3). Developing future-proofed digital and technical skills is a challenging task as the fast pace of change means we are aiming at a moving target, but there are numerous frameworks we can draw upon.

For learners, employers and organisations WEF have created a global skills framework with these development needs in mind (WEF, 2021b). Importantly, the framework of 'competences' considers 'skills and knowledge' (including innovation and creativity) but also 'abilities' (including dexterity, verbal and active listening) and 'attitudes' (including resilience, global citizenship, self-management and social influence).

For vocational educators, The European Training Foundation's 'Creating New Learning' (CNL) initiative has developed the Reference model for Educators' Activities and Development in the 21st-centurY (READY) (CNL, 2022). This offers a structure to help vocational educators identify 21st-century professional practices and pinpoint their development needs. The model employs six domains of professional activity: learner-driven, context-specific, adaptability and initiative, sustainability and inclusion, collaboration and engagement, lifelong learning and reflection and use of digital technologies.

It is clear that use of digital and learning technology and development of digital skills has been placed front-and-centre and embedded thoroughly throughout every section of WEF's interactive taxonomy and the CNL READY model. Both models also focus on the essential interpersonal, communication and collaboration skills and attitudes necessary for employment and learning which are underpinned and aided by developed digital skills.

Regarding specific digital skills, we have numerous valuable frameworks for informing and guiding vocational digital skills development and for developing the skills of the vocational educators and learning technology support colleagues who empower this development. The models are informed by the EU's Digital Competence Framework (Digicomp 2.2) (European Commission, 2022) for learners and organisations, and by the European Framework for the Digital Competence of Educators (DigicompEdu) (European Commission, 2017) for educators.

All frameworks have some commonalities, though each brings a specialist focus to the landscape. Frameworks from ALT (2021), DfE (2019), ETF/Jisc (2018) drawing from ETF/SERCO (2018), HEA (2017) Jisc (2017), and SET/ETF (2022) are summarised in **Appendix 2** with specific areas of focus noted as appropriate. These skills frameworks will underpin the remainder of this research.

Findings on the widening of the 'digital divide' during the COVID pandemic for those excluded from digital networks and having less well-developed digital skills were foregrounded in the previous chapter (Aldridge, Jones and Southgate, 2020: Lloyds Bank, 2021: Good Things Foundation, 2021: Hutchings and Sheppard, 2021: Ufi, 2020 a and b). This widening of the digital divide for excluded learners promises to continue without purposeful action, so effective development and deployment of vocationally-focussed technology (VocTech) is important for these adult learners in particular.

Ufi's White Paper (2021) is a final valuable framework we can draw on which identifies specific, key VocTech Challenge focus areas. The Paper's aim is to 'catalyse change in the adoption and deployment of technology to level up vocational learning for those most at risk of falling behind' (UfI, 2021:5). Like the WEF (2021) and CNL (2022) frameworks, the VocTech Challenge focus areas consider the wider context of vocational education, focussing particularly on how we can support the skills development of learners most at-risk of digital exclusion.

The Paper has five key focus areas framed as 'problem definitions':

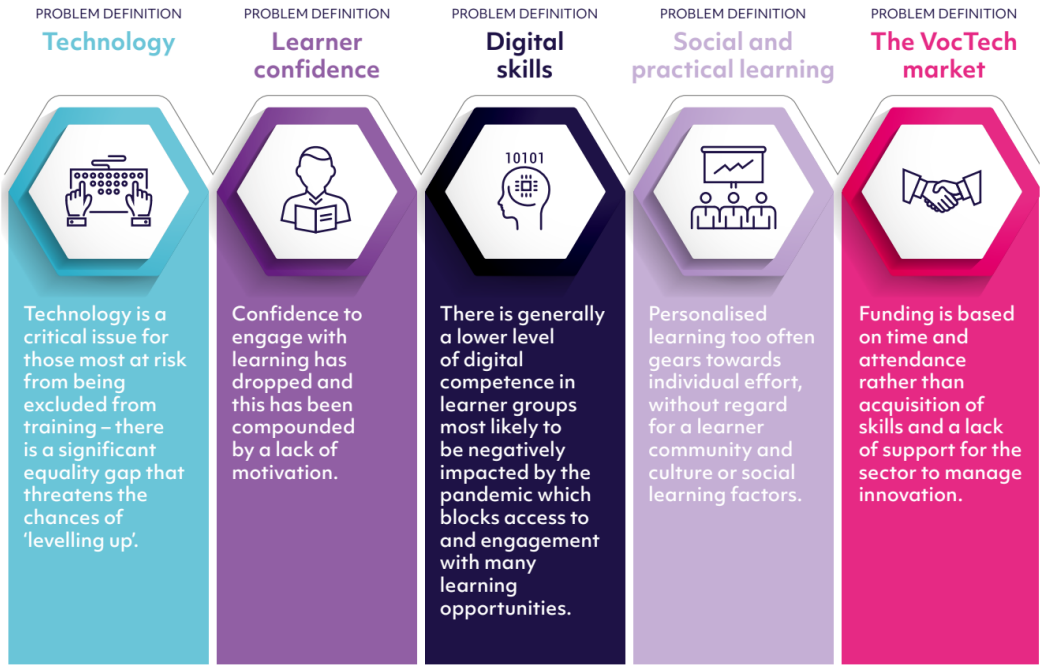

Image courtesy of Ufi (2021)

Common themes which emerge when interrogating the breadth of these frameworks, then, are the need for vocational learners, educators and their supporters to:

Develop the skills to select and use digital devices and networks
Source, validate, manage, analyse, edit and present information
Communicate, transact and collaborate effectively in the digital domain
Operate lawfully and ethically in digital spaces with inclusion in mind
Manage personal and professional digital identity and wellbeing

Underpinning these core skills are abilities to analyse and solve problems, to have the confidence to experiment with and master new digital tools and networks and the reflective ability to evaluate their own performance and plan and action further development.

Armed with these frameworks for general vocation skills and specific digital skills development, we can now examine programmes which have sought as a whole, or in part to develop vocational skills using learning technology and digital tools and networks. The next chapter seeks to do this by investigating 'what works' in recent and current vocational skills development programmes. It analyses initiatives from Ufi, DfE, and ETF as well as some independent professional network groups run by and for educators working in post-16 vocational education.

An outline of the main areas covered by the frameworks, models and papers discussed above can be seen in the table below.

Authors / Date	Framework and digital skills areas	Focus Area

For vocational learners and the educators developing learners' skills		
Jisc (2017)	Digital capabilities: Individual: · Information, data and media literacies · Creation, problem solving and innovation · Learning and development · Communication, collaboration and participation · ICT proficiency · Identity and wellbeing. Organisational: · Content and information · Research and innovation · Communication · Learning, teaching and assessment · ICT infrastructure · Organisational digital culture.	Individuals, organisations and industry developing digital skills. Broad based, of particular value to higher level vocational courses, 'HE in FE' and the workplace
DfE (2019)	DfE Essential Digital Skills framework and national standards (EDS) and accompanying ETF EDS CPD programme · Using devices and handling information: managing and storing information, identifying and solving technical problems · Creating and editing: documents and digital media, processing numerical data	Essential digital skills for life and work for young people (16-19) and adults with no or lower levels of digital skills

	· Communicating: sharing and managing traceable online activities · Transacting: using online services, buying securely online · Being safe and responsible online – protecting privacy and data, being responsible online, digital wellbeing.	
Open University (OU) (2022 - update)	Open University Digital Skills Framework: · Understand and engage in digital practices · Find information · Critically evaluate · Manage, create and communicate information · Collaborate and share.	Individuals, organisations and industry developing digital skills: Broad based for all learners.
Specifically for vocational teachers, trainers and learning support colleagues		
ETF (2022)	Refreshed Professional Standards for Teachers and Trainers Standard 16: Select and use digital technologies safely and effectively to promote learning Standard 17: Develop learners' mathematics, English, digital and wider employability skills	Competency framework for teaching and training practitioners across all parts of the FE sector, including for learning providers in the workplace, community settings and prisons
Higher Education Academy (HEA) (2017)	'Digital lens' on the UK Professional Standards Framework (UKPSF): · Design and plan learning activities and/or programmes of study	Supporting the digital capabilities of teaching staff in UK Higher Education - focus on HE or 'HE in

	· Teach and/or support learning · Assess and give feedback to learners · Develop effective learning environments and approaches to student support and guidance · Engage in continuing professional development in subjects/disciplines and pedagogy, incorporating research, scholarship and the evaluation of professional practices.	FE’
ETF / Jisc (2018) informed by ETF/SERO (2018)	Digital Teaching Professional Framework · Planning your teaching: designing, collaborating, empowering · Approaches to teaching: resources, face-to-face, blended and online contexts · Supporting learners to develop employability skills · Subject-specific and industry-specific teaching · Assessment and feedback · Accessibility and inclusion, equality and diversity Self-development: reflection, CPD/progression, teacher and learner wellbeing and identity management.	Competency framework for teaching and training practitioners across all parts of the FE sector, including for learning providers in the workplace, community settings and prisons
Society for Education and Training (SET) (2022)	SET Qualified Teacher Learning and Skills (QTLS) status and Advanced Teacher Status (CTeach equivalent)	FE and Training professionals completing professional formation via QTLS or ATS (requiring digital

Education and Training Foundation (ETF) (2022)	Framed around ETF's 20 Professional Standards (2022) including: 16. Select and use digital technologies safely and effectively to promote learning 17. Develop learners' mathematics, English, digital and wider employability skills.	portfolio) to show progression and commitment to excellence within the sector using ETF Professional Standards
Specifically for learning technologists and vocational educators designing digital learning		
CMALT, ACMALT and SCMALT (ALT, 2022)	Certified Membership of the Association for Learning Technology (CMALT) Associate CMALT (for Early Careers Teachers) SCMALT (progression for those with strategic responsibility and research roles) 1 Operational Issues a Understanding of the constraints and benefits of different technologies b Technical knowledge and ability in the use of learning technology c Supporting the deployment of learning technologies 2 Learning, teaching and assessment a An understanding of teaching, learning and/or assessment processes 3 The Wider Context a Understanding and engaging with legislation	Professional recognition for those actively involved in understanding, managing, researching, supporting or enabling learning with the use of Learning Technology

	4 Communication and working with others.	
ALT (2021)	Framework for Ethical Learning Technology (FELT) Awareness: respect stakeholder interests, mindful use, critical practice, limits of knowledge and potential for bias Professionalism: accountable, evidence-led practice, ongoing CPD, integrity and honesty, law and policy compliance, advocacy for ethical approaches Care and community: practice of care for self and others, collegiality and mutual understanding, minimisation of risk and harm, recognition of responsibility and influence Values: agency and development of learners, fair and equitable treatment and access, inclusive, supportive, accessible development, celebrating diversity, open, honest, accountable development.	Individuals, organisations and industry in developing the ethical use of learning technology across sectors
For leaders and whole organisations developing a digital culture		
Jisc (2018)	Organisational Digital Capability Framework (6 elements) Core activities: Content and Information: information data and media use, strategy, systems, recruitment Research and Innovation: strategy, creativity, research and problem-solving, innovation, transformation	Senior leaders, directors, trustees seeking to embed a digital culture in an organisation

	Communication: digital communication, collaboration and participation, infrastructure, networks, open practices Learning, teaching and assessment: strategy for digital infrastructure, resources, rewards and recognition for capabilities ICT Infrastructure: planning, procurement, development, roll-out, recruitment, evaluation Organisational digital culture: strategy and policy for developing organisational digital identity and wellbeing supporting developmental culture, managing risk.	
Jisc (2022)	Jisc organisational digital capabilities maturity model Core activities: Content and Information: information data and media use, publication management for knowledge creation and sharing Organisational digital culture: embraces digital technologies and develops digital capabilities of learners and staff Learning, teaching and assessment: practices motivate, empower and develop digitally-capable, independent learners TLA practices use digital technologies to demonstrate achievement and prepare learners for future success Research, innovation and scholarship: underpinned by digital capability, exemplify how digital capabilities support corporate	Senior leaders, directors, trustees further developing mature digital cultures in an organisation

	social responsibility and responsible research practice ICT infrastructure: robust, secure and flexible digital Infrastructure, giving its staff and learners reliable, secure access to information and tools needed Digital communication use enhances organisational efficiency and effectiveness and furthers strategic goals.	

Note:

As many of these roles and identities shift and intersect, it may be useful to frame the information in the 'focus' column using Jisc's (2022) 'role profiles' tool which forms part of their 'Individual digital capabilities' work to help organisations and individuals to review skills individually or across teams.

Acknowledgements and Thanks

The #AmplifyFE research team offer grateful thanks to the following people who generously gave their time and expertise to contribute to this research:

#AmplifyFE Community Space participants. #AmplifyFE works to connect and amplify communities of practice for digital learning, teaching and assessment in vocational education and welcomes new members here

Claire Collins who is the programmes director at ccConsultancy, a research and development company that specialises in post-16 education and training. She tweets as @ClaireCollins8.

David Cooper who is a Voctech Challenge 2021 project lead and CITB Northern Ireland project manager

Joss Kang who is director of touchconsulting Ltd and co-director of FE Constellations, the Changemakers Community for FE. FE Constellations is a new online membership community that's research-informed and freshly designed for Connection, Collaboration and Co-creation

Peter Kilcoyne who is co-founder of Transform Education. He developed and works with the Blended Learning Consortium

Sarah Knight who is Head of Learning and Teaching Transformation, Higher Education and Research directorate, Jisc

Diana Laurillard who is Professor of Learning with Digital Technology at UCL Knowledge Lab. Her current research includes: 'The Transformational Potential of MOOCs' (Centre for Global HE, UCL-IOE); 'Future Education' (RELIEF Centre, UCL-IGP) and the Learning Designer tool.

Vikki Liogier who is National Head of EdTech and Digital Skills at the Education and Training Foundation and is currently involved in shaping the Further Education and Training Sector through Digital Capabilities. She tweets @vikkiliogier

Lou Mycroft who is a co-creator of the FAB Model of Digital Persistence* and co-founder of the #JoyFE💛 Collective. She co-facilitates the changemakers' community FE Constellations and the culture change training and coaching company Thinking Cultures. She tweets @loumycroft

Debbie Shipton who is a fundraiser for YMCA DownsLink Group, working on their Passport to Independence programme for disadvantaged young people, and tweets at @dmshipton

Ufi Voctech Challenge participants. Participants in the Voctech Challenge 2021-22 contributed to the work in discussions during Challenge meetings.