Building digital skills in the Further Education Sector

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Building digital skills in the FE Sector

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Executive summary

This paper highlights the importance of supporting FE teachers to help them improve the teaching and learning of digital skills, given the increasing demand for digital skills across the UK workforce.

Digital skills are increasingly being considered as a crucial complement to essential English and maths skills. This applies to all learners, not just those in technical education.

The traditional view of literacy as the ability to read and write has expanded to encompass understanding digital tools and information for the whole workforce. However, a high proportion of adults in the UK lack the digital skills to engage fully as citizens, and England and Northern Ireland is below the OECD average for digital skills related to work.

Blended learning methods to upskill teachers and assist them to update their teaching approach could enable the UK to improve its relative position internationally.

The sector is increasing the use of learning technology to update teaching methods through funded projects, but the work remains uncoordinated and inefficient. It will be important for teachers to use technology for scalable models, shared innovations and collaborative learning among professionals if they are to keep pace with innovation in teaching in an affordable and sustainable way.

Models for change are:

- Scaling up learners' use of digital methods across the curriculum

More elements of vocational courses could benefit from technology-enhanced learning activities and formative assessments, using automated and peer-reviewed methods.

Digital methods would enable the sector to complement the future move to local autonomy with sector-wide collaborative provision of online courses that could be sourced centrally and tutored locally, thereby offering a wider range of provision at the local level.

- Employer-provider collaboration projects on workplace digital skills

There are proven models in the sector for building collaborative partnerships between employers and training providers. The new national colleges could greatly extend their value if they were to follow these models of utilising digital resources for learning and use online learning to offer central expertise plus local tutoring to other regions.

- Teacher support via peer collaboration to accelerate innovation

If the expectations of teachers explicitly include digital education skills for teaching both specific and generic digital skills, peer collaboration would help teachers to meet the accelerated innovation requirements being demanded of them.

- Strategic leadership in the sector for rapid digital progress

Open online courses show that it is feasible to develop the critical mass of engaged and collaborative teaching innovators who will sustain the FE teaching workforce. Such a learning community could adapt to changes in demand and the continual innovation in learning technology. Such courses could also be offered to support leaders and governors in a strategic approach to optimise digital technologies for teaching and learning.

The main policy consideration is to invest in the use of digital learning innovations by teaching professionals to develop, test, peer review, publish and share their effective practices. This will build a self-sustaining learning system at the heart of the future development of the sector. Actions in support of this are to:

- Enable pedagogic innovation;

- Develop digital skills across the curriculum;

- Update assessment methods to more digital forms;

- Support teachers in keeping their digital skills capability updated;

- Support leaders and governors in developing digital innovation;

- Develop a policy for digital skills in the teaching and graduate workforce.

Introduction

How will the FE sector ensure that its supply of graduates keeps up with employers' demands for digital skills? The current approaches to innovation by college management and by teachers and trainers could be used to propose the elements of an alternative model of educational provision.

This review does not focus on making the case for digital skills; the focus is on the implications for the FE teaching workforce who have to supply digitally skilled graduates. It reviews the professional practices needed to meet the demands of our future workforce in a sustainable way.

1. Digital skills for learners and for teachers

Two skills categories can be distinguished: the digital skills learners need for the workplace, and the digital competence the teachers need in order to prepare their learners effectively.

1.1. Digital skills for learners

Digital skills for learners are those needed in the workplace in all types of jobs and levels of responsibility. They are not just for ICT professionals (ECORYS 2016). They encompass:

• The technical skills required for the digital applications related to a specialised job;

• The skill to adapt to new digital applications as opportunities change.

No employment area is exempt from the need for these technical skills. Employees in technical, non-technical and unskilled jobs will need generic digital skills to be employable. As almost every job becomes technology-related (Eckhard et al., 2014), all learners in the FE sector must be able to attain a basic level of digital skills.

The present position

Technological innovation will continue to change the profile of many jobs, e.g. in health and social care, retail and logistics, manufacturing, and construction (CITB, 2014; Eckhard et al., 2014), so there will be a continuing need for training and re-training in specialist digital skills (ECORYS, 2016, p31):

• Skill shortages threaten to hinder productivity gains that would be possible by using digital technologies in up to half of all companies;

• Jobs may be replaced through increasing automation of manual jobs;

• A lack of digital skills hinders many retail employees in moving from conventional place-based to e-commerce and blended retail activity.

Most young people entering these employment areas are currently developing their competencies as part of the FE sector, which means there is a pressing need to start planning how to equip them with the relevant skills for the digital era.

However, ICT enrolment, in comparison with key business areas, is on a downward trend in recent years, as Figure 1 shows.
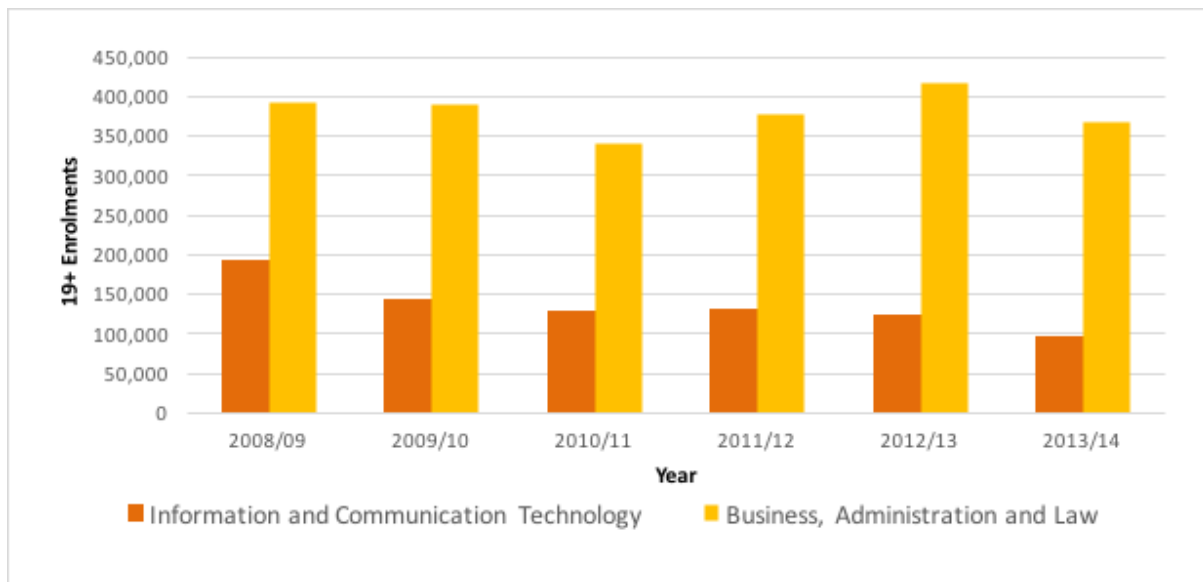
Figure 1. 19+ enrolments for ICT are decreasing, compared with those for Business
Source: The chart is derived from DfE-SFA FE Trends Data, 2016[1].

Recent reports for the sector show that supply is not meeting the demand for specialist IT skills (TECH 2015), as shown in Figure 2.
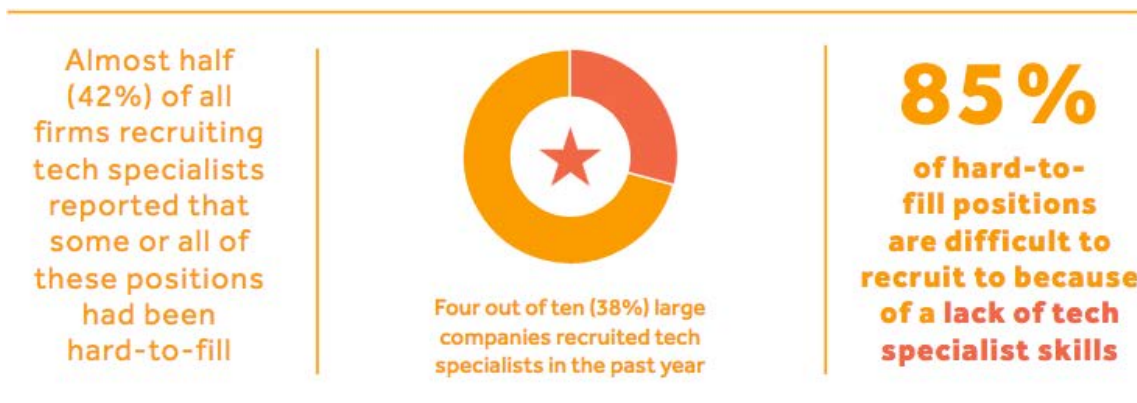
Figure 2. The gap in filling jobs requiring technology specialist skills.
Source: Taken from (TECH 2015) with permission from © 2015 Tech Partnership Ltd.
Note:The Tech Partnership (2015) survey reflects the responses from over 1,500 businesses across a range of industries.

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[1] FE data library: other statistics and research: www.gov.uk/government/statistical-data-sets/fe-data-library-other-statistics-and-research#fe-trends

At present, England is significantly lower than the OECD average for problem-solving skills in a technology-rich environment, as shown in Figure 3, with marked differences across the regions (BIS, 2013). There are 18 million adults aged over 19 who have been identified as 'assisted digital', that is, requiring some assistance from others to carry out basic interactions with government online, such as to provide basic information, make a payment or provide detailed information (Altman, 2015).
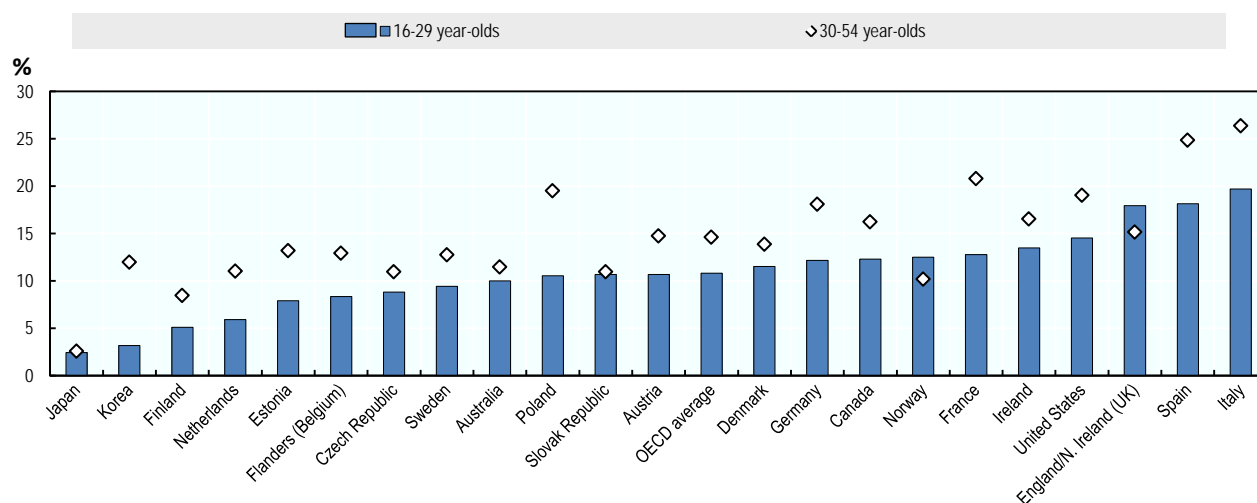

Figure 3. A high proportion of 16–29 year olds in England/Northern Ireland have low problem-solving skills in technology-rich environments.
Source: OECD calculations based on the Survey of Adult Skills (PIAAC, 2012). Note: The results present the share of 16–19 year olds and of 30–54 year olds failing to reach Proficiency Level 2 in literacy and numeracy and Proficiency Level 1 in problem-solving in a technology-rich environment.

Given the increasing demand for digital skills, proficiency in this area is becoming a crucial complement to essential English and Maths skills. This applies to *all learners*, not just those in technical education. The New Media Consortium (a not-for-profit group of more than 250 higher education institutions that conducts research into emerging technologies) emphasizes that: "the traditional view of literacy, as the ability to read and write, has expanded to encompass understanding digital tools and information" (The NMC Horizon Report: 2015 Higher Education Edition).

The future

The government's Post-16 Skills Plan will create a two-year college programme at the start of each new vocational route, and the common core in each programme includes digital skills. It is very important that the plan for the programme is to be open to 16 to 19 year olds, and that the NEETs in this group with low-level skills can also receive subsidised training. With this in mind, digital literacy should be an exit skill for all FE sector graduates.

1.2. Digital skills for teachers

Digital skills for teachers and trainers are essential if they are to nurture digital literacy in their learners. The US-based 2016 Horizon Report includes both *Blended Learning* and *Digital Literacy* among what is called 'the near-term solvable challenges' (NMC, 2016), which require the teaching workforce to be:

- Developing new curricula that respond to technological changes in the workplace in each specialist field and which include opportunities for more generic digital skills in every curriculum area;

- Planning and managing the change to blended learning;

- Using technology to support learners in the classroom, at college, at home and in the workplace;

- Using technology to keep abreast of the changing environment for their learners; and

- Promoting scalable, innovative course designs.

The present position

The requirement for teachers and trainers to support development of digital skills is not easily shoehorned into an already pressurised working environment. The Commission on Adult Vocational Teaching and Learning (CAVTL) report recommended to:

> "…further support the continuing professional development of vocational teachers and trainers in order to build their pedagogical knowledge of the optimal use of learning technologies" (CAVTL 2014).

One of the few other relevant reports to recommend more support for teachers concludes that at present 'CPD is not enough of a priority across education' (Digital Skills Taskforce, 2014). Teachers need continual updating in response to changes in the digital world because digital advances make retraining and lifelong learning more important than ever.

The Further Education Learning Technology Action Group (FELTAG), established by the Minister for Skills at the time, commissioned a survey to test the barriers to innovation, and the actions needed to address them (Association for Learning Technology, ALT 2014). The principal barriers are shown in Table 1.

Lack of resource to provide release and support for staff to enable them to incorporate technology into their practices.	84%
Reliance on individuals to champion innovation and exploitation of their willingness to support colleagues.	83%
Lack of direction at a strategic level resulting in fragmentation of practice across provider curriculum areas and levels of work.	81%
Lack of credit and recognition for innovative uses of technology by key influencers, such as government agencies, awarding bodies and governing bodies.	81%

Table 1. The four highest barriers to effective use of learning technology according to survey respondents
Source: ALT survey, 2014.

Teachers feel that they lack digital leadership, as shown in Table 1, although they continue to innovate as their digital skills improve and more tools and resources become available. However, there is a risk that the work will remain patchy and uncoordinated, and far less productive than it could be.

The challenge now is to shift the culture from learning technology being used only by the enthusiasts, or within project funding, to embedding technology into normal practice for both staff and students. One college-based project - Learning Futures Programme[2] set out to support a cross-college culture shift, embedding learning technology within staff and student practice. The project piloted and evaluated a series of staff development initiatives. As a result of feedback from staff and students, the project report recommended the need for:

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- Executive and senior management commitment to ensure that they can champion and support implementation;

- The technology infrastructure and digital resources, e.g. Wi-Fi network and bring your own device (BYOD) policy; and

- Staffing resources to support peer-to-peer learning.

The Further Education Learning Technology Action Group (FELTAG) report also recommended that all courses include online learning, and that teachers should have continuing professional development to enable them to understand and optimise the use of learning technology.[3]

The sector agencies (e.g. Education and Training Foundation, Learning and Work Institute, Jisc and the Ufi Charitable Trust) have funded local, college-based projects that cover a wide range of employment sectors, and each project is individually impressive. However, their findings and outputs are not yet being coordinated as a dynamically developing and structured knowledge base for the sector, and are not being scaled up across the remainder of the sector. The principal way in which projects and innovators share their findings on effective practice is through publishing a short case study on a website.

The current FELTAG update from Jisc demonstrates that the sector has responded with several initiatives showcased as exemplars of effective practice.[4] The teaching workforce is responding to the FELTAG call for greater use of learning technology, and this is appreciated by respondents in the recent Jisc survey on students' digital experience:

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[2] Learning Futures Programme: http://lfuturesnews.co.uk/wp-content/uploads/2015/10/Blackburn_FinalReport.pdf
[3] Further Education Learning Technology Action Group (FELTAG) recommendations: government response: www.gov.uk/government/publications/further-education-learning-technology-action-group-feltag-recommendations-government-response
[4] The evolution of FELTAG: a glimpse at effective practice in UK further education and skills: https://www.jisc.ac.uk/reports/the-evolution-of-feltag

> *70% of FE and skills students agreed that when technology is used effectively by teaching staff, it helped their learning experience (Jisc, 2016[5]).*

Exemplars that Jisc identifies as effective teaching with technology have been contributed specifically by FE providers, for example:

- To support independent learning, [the] lead tutor encourages learners to develop their own technology resources;

- Every learner is provided with an iPad preloaded with a selection of apps that support learning, including those that call for collaboration and team working;

- Former students have been enlisted to share recent experiences of networking, including the value of LinkedIn;

- The team created a sophisticated platform that could provide tailored support for learners, deliver more choice, and achieve business efficiencies.

The UK has the capacity to extend and maintain this innovation. The US Horizon Report recommends the Ufi-funded 'Blended Learning Essentials' online course (a massive open online course, or MOOC),[6] developed on the FutureLearn platform in the UK, as a way of providing professional development for college leaders to help spread effective blended learning course design.

The future

The Ufi massive open online courses (MOOCs) attracted more than 17,000 active participants over the 3 successive runs of the courses, primarily from FE, but also from HE and other schools. This level of engagement with online courses suggests that this technology would be feasible as a system-wide solution for teacher professional development.

The use of blended learning methods might be the key to securing personalised learning, flexibility of study (mixing online with place-based study), inclusivity (through widening access to education) and productivity (through economies of scale) in the UK (DfES, 2005; Luckin et al., 2012).

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[5] Six examples of FE and skills providers delivering effective practice:www.jisc.ac.uk/blog/six-examples-of-fe-and-skills-providers-delivering-effective-practice-13-jun-2016

[6] Blended Learning Essentials, Getting Started: http://bit.ly/28RNQpI; Embedding Practice: http://bit.ly/1ZQeWOC

2. Models for change

This section sets out the current initiatives and projects that are feasibility studies or proof-of-concept models for possible future directions.

2.1. Scaling up learners' use of digital methods across the curriculum

Current successes

Despite the barriers to including digital skills in the curriculum and integrating the use of learning technology, agencies in the sector have funded a range of projects and programmes, partly in response to FELTAG, to promote digital innovation, learning technology and a digitally-oriented curriculum. The key players are the Education and Training Foundation's Learning Futures Programme[7] and Jisc's work on implementing the FELTAG agenda,[8] the Tinder/Good Things Foundation[9] and the Ufi Charitable Trust digital projects.[10] Each of these agencies' websites provides access to a wealth of local experience and evidence of effective digital interventions, which have been well documented by the local projects. The Tinder Foundation, for example, records a significant impact on savings (e.g. £3.7m in saved GP visits, and £2.3m in saved A&E visits) from teaching digital health skills in collaboration with the NHS on their *Widening Digital Participation* programme (Tinder, 2016).

The future

Assessment is a critical factor in innovation, and research studies demonstrate the potential for improvements in formative assessment with greater use of automatically tracked learning analytics. Learners' digital traces provide valuable feedback to both learners and teachers. They are used to add to learner opportunities for formative assessment, and to improve human-based assessment rather than to replace it (Charlton, Mavrikis, & Katsifli, 2013). Automated assessment is used in English language testing[11] and for the driving theory test[12], and there are many elements of vocational courses that could be assessed in this way. There is a strong case for researching greater use of automated testing, as well as authentication of the user's identity alongside human assessment.

Similarly, digital methods can be used for organising peer assessment, where both reviewing and receiving feedback are shown to provide valuable formative learning (Laurillard, 2016).

There have been pockets of excellence in learning technology across the sector for many years, as short-term funding engages enthusiasts, but the lack of systemic effort keeps these useful projects in their original locations at best. **The optimal use of digital technology across the curriculum is wholly dependent on a cross-sector, systemic and strategic plan for the future**.

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[7] Education and Training Foundation's Learning Futures Programme: http://lfuturesnews.co.uk/
[8] FELTAG agenda: https://www.jisc.ac.uk/rd/projects/implementing-the-feltag-agenda
[9] Tinder Foundation was recently renamed the Good Things Foundation: https://www.goodthingsfoundation.org/
[10] Ufi Charitable Trust digital projects: http://www.ufi.co.uk/projects
[11] Peason: www.pearsonassessments.com/feature/tell/index.html
[12] Theory test: cars: https://www.gov.uk/theory-test

The Post-16 Skills Plan's intention to work with sector agencies, such as Ofsted, the Education and Training Foundation and the Education Endowment Foundation (EEF), could make a significant difference to system-wide effectiveness, especially if it includes the FE sector awarding bodies (which ensure full alignment across intended curriculum outcomes), teaching methods and forms of assessment. **The scope of the planned Institute for Apprenticeships could be widened to ensure expertise in digital learning and assessment methods**, so as to exploit the significant opportunities they present for radical and sustainable improvements in the sector.

The planned structural changes in the sector of establishing 15 routes to industry employment and rationalising provision through Area Reviews are being introduced without reference to how digital technology could help. For example, local areas decide on the routes to focus on with respect to the demands of the local economy and thus irrespective of the interests or talents of their learners, reducing their motivation to learn. But those local learners, instead of being strait-jacketed by current employment opportunities, could use digital means to engage with online courses and support from distant providers collaborating with a local provider.

To offer optimal provision to the wide range of learners at local level, it will be important to complement the future move to local autonomy for colleges and other training providers with sector-wide collaborative provision of online courses that can be tutored locally, thereby offering a wider range of provision at the local level. **The future plan should offer a vision of digital opportunities that will both enhance local provision and enable local providers to supply their expertise to areas that are further afield.**

2.2. Employer-provider collaboration projects on workplace digital skills

Current successes

Recent reports on the sector have recommended that more employers be engaged in the Vocational Education and Training (VET) system, and play a more active role in providing learners with the information, advice and guidance that they need (Digital Skills Taskforce, 2014; CAVTL 2014). A model for such collaboration is the '*Teach Too*' project, funded by the Education and Training Foundation, for employers and providers to work in partnership on the co-design, delivery and assessment of vocational education and training programmes. Figure 4 outlines the employers, providers and learners who benefitted from the 27 projects.
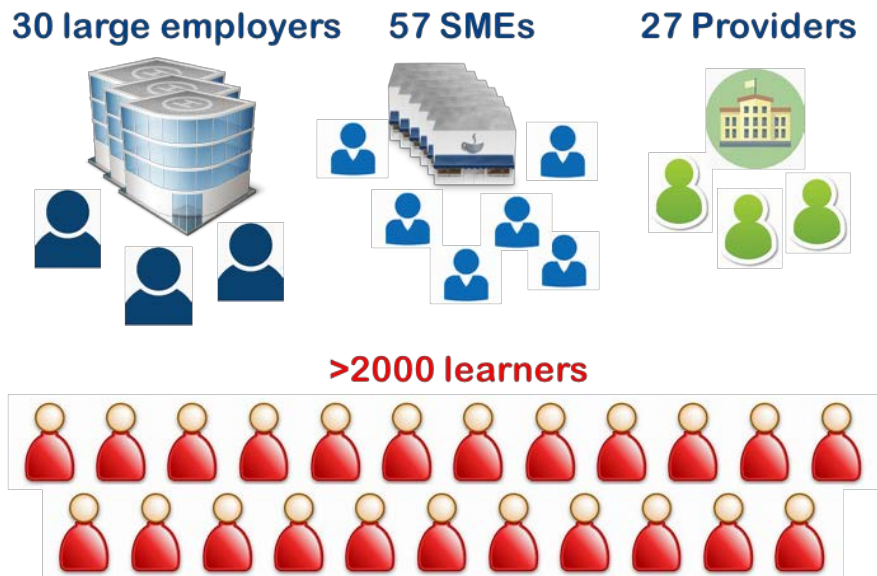
30 large employers   57 SMEs   27 Providers

>2000 learners

Figure 4: 'Teach Too' employer-provider collaborations

Figure 5 summarises a project that used online resources to contextualise maths problems for the practical problem of loading aircraft. Both the employer and the college involved gained expertise from the collaboration, as well as providing a highly motivating context for learning maths.

Teach Too case study: Maths Aviation

What they did
- Employer was funded to teach maths applied to aircraft load control
- The college delivered the relevant functional maths for GCSE
- Learners used maths to complete activities in the load controller role
- They explored the implications of incorrect data analysis
- Teaching staff supported employer delivery of sessions
- They used examples from air crash investigations
- Employer staff assessed progress and gave feedback

What happened
- Learners understood the importance of maths
- Learners highly motivated by real world context
- All progressed to Year 2 and achieved higher grades
- Teaching staff upskilled in industry knowledge
- Motivated to use new online resources
- Model used for other industry linked topics
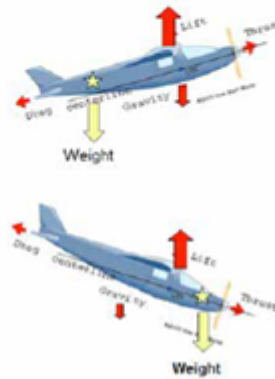- Employer staff developed their in-house training

Figure 5: The aviation maths case study of an employer-provider partnership from the 'Teach Too' project. Source: Adapted from Swissport Maths Aviation Project, Craven College 'Teach Too' project[13]

The projects included digital approaches across the curriculum, including Aviation Maths, as in Figure 5 (also Hospitality and Tourism, and Hairdressing), as well as in the curriculum for high-level digital skills, such as Robotics, as in Figure 6.

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[13] Teach Too: Craven College: contextualising the design and delivery of maths with Swissport International Ltd: http://tvet.excellencegateway.org.uk/content/etf2302

Teach Too case study: Robotics

What they did
- Employer was funded for experts to collaborate on a live brief
- Learners from ICT and media disciplines worked together to develop a 'Rover' robot, with 3D printed components
- Teaching staff were trained in programming techniques
- Employer staff assessed progress and gave feedback
- Learners presented their products to a panel of experts who assessed their work

What happened
- Positive peer pressure between the teams
- Learners highly motivated to complete
- All progressed to Year 2 and achieved higher grades
- Training staff upskilled in technology
- Motivated to use new online resources
- Model used for other cross-curricular topics
- Employer developed knowledge of other products and markets

Figure 6: The robotics case study of an employer-provider partnership from the 'Teach Too' project. Source: Adapted from the Entrepreneurial Robotics and Physical Computing Project, Carshalton College 'Teach Too' project[14].

The Teach Too project findings, 11 of which had a strong focus on digital technology for learning, show that these collaborative partnerships produced significant short and medium-term benefits, similar to those in Figures 5 and 6, for employers, providers and learners, and enriched and strengthened local economies and communities[15]. Integration of this kind at the local or regional skills system level of pre-vocational, pre-employment and in-employment training demonstrated effects as follows:

- Learners gained valuable skills and experience specific to the working environment within the industry[16];

- Staff gaining industrial knowledge and other skills gave them increased confidence in using new technologies[17];

- Students were motivated by the real-world context and developed confidence in using maths though the use of the real industry situation[18];

- Staff, from both the provider and the employers, were upskilled in the use of digital tools and e-safety.[19]

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[14] Teach Too: Carshalton College: working with Mirobot on entrepreneurial robotics and physical computing': http://tvet.excellencegateway.org.uk/content/etf2301
[15] 'Teach Too' projects at Excellence Gateway: http://www.excellencegateway.org.uk/
[16] 'Teach Too' in a fast-moving technology sector: https://api.excellencegateway.org.uk/resource/etf:2303
[17] Entrepreneurial Robotics and Physical Computing: https://api.excellencegateway.org.uk/resource/etf:2301
[18] Swissport Maths Aviation Project: https://api.excellencegateway.org.uk/resource/etf:2302

The future

The future plan is for National Colleges to focus on delivering high-level technical skills at levels 4 to 6, using teachers with an up-to-date understanding of the industry, and located in environments that simulate the workplace. **The *Teach Too* projects offer a proven model for building these closer on-going collaborative partnerships between employers and training providers** on the design and delivery of vocational training programmes.

The Post-16 Plan promotes local area autonomy, which, because of its localised nature, risks doing little to ameliorate current regional inequality. It is evident in the case, where the Eastern region scores 3% above the national average for problem-solving in a technology environment, and the North East scores 5% below, and 6% below for numeracy (BIS, 2013). However, when the learning activities use digital resources and experts can engage online at a distance, the example of Aviation Maths (above) could be applied anywhere, with local tutors benefitting in the same way. **The new National Colleges could greatly extend their value if they: (a) follow the *Teach Too* model of utilising digital resources for learning, and (b) run a cascade model of central expertise delivered via MOOCs plus local place-based tutoring to other regions.**

2.3. Teacher support via peer collaboration to accelerate innovation

Current successes

The gradual 'democratisation' of content is helping colleges to reduce and spread the cost of producing their own content as more collaborative approaches develop. A more digitally skilled teaching profession will be able to source content from their peers and partners through sites such as the Excellence Gateway[20] and Jisc's open educational resources.[21]

With respect to building their own digital education skills, therefore, the FE sector teaching workforce is preparing to become more mutually supportive by sharing innovative digital resources.

The future

The Post-16 Skills Plan includes provision for a new standard of FE learning and for skills teachers to support the delivery of each apprenticeship route. **If this new standard explicitly includes digital education skills for both specific and generic digital skills for learners, this would help teachers to meet the requirements being demanded of them.** There have been several 'ICT competency' standards developed for teachers,[22] and a new European standard is currently being trialled (the Technology-Enhanced Teaching Self-Assessment Tool, TET-SAT[23]), which could act as a model for the new standard. Given that one of the main

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[19] Sharing skills for success in small service sector businesses:
https://api.excellencegateway.org.uk/resource/etf:2318
[20] Excellence Gateway:www.excellencegateway.org.uk/
[21] Open educational resources (OERs): www.jisc.ac.uk/guides/open-educational-resources
[22] UNESCO ICT Competency Framework for Teachers: www.unesco.org/new/en/unesco/themes/icts/teacher-education/unesco-ict-competency-framework-for-teachers/ and ISTE:
www.iste.org/handlers/ProductAttachment.ashx?ProductID=3612&Type=TOC
[23] Mentep - Mentoring Technology Enhanced Pedagogy: http://mentep.eun.org/

barriers for teachers is 'lack of credit and recognition for innovative uses of technology' (see section 3.2), the new standard should have an important motivating effect.

The Ufi Charitable Trust is pioneering a new approach to supporting FE teachers in using digital technology to embed digital skills across the curriculum. They are funding large-scale professional development in the form of MOOCs on the FutureLearn platform, *Blended Learning Essentials: Getting Started*, and *Embedding Practice.*[24] The two courses have run 3 times within a year, to reach over 15,000 participating FE sector teachers and trainers, as Figure 7 illustrates.
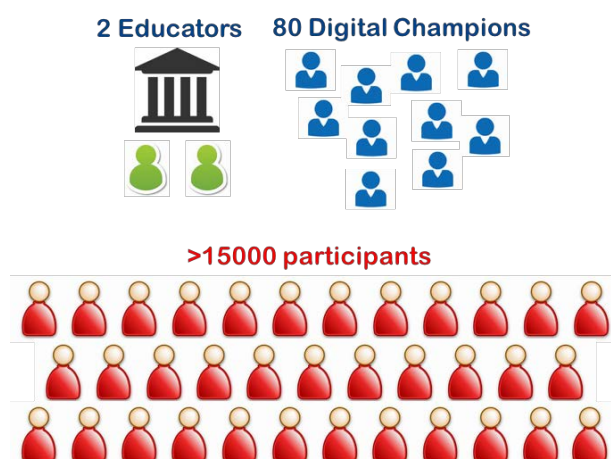

Figure 7: MOOCs scale up professional development via digital courses online

The two courses have received very high satisfaction ratings, and are reaching large numbers of teachers, who can return to the online materials at any time to see videos of the latest practice and debate their own response to the digital pedagogies being demonstrated (see Figure 8). This is a significant innovation in creating a more coherent cross-sector approach to digital innovation in teaching and training. These courses show how it would be **feasible to develop a critical mass of engaged and collaborative innovators** who would sustain the FE teaching workforce as a learning community, always able to adapt to the continual innovation in learning technology.
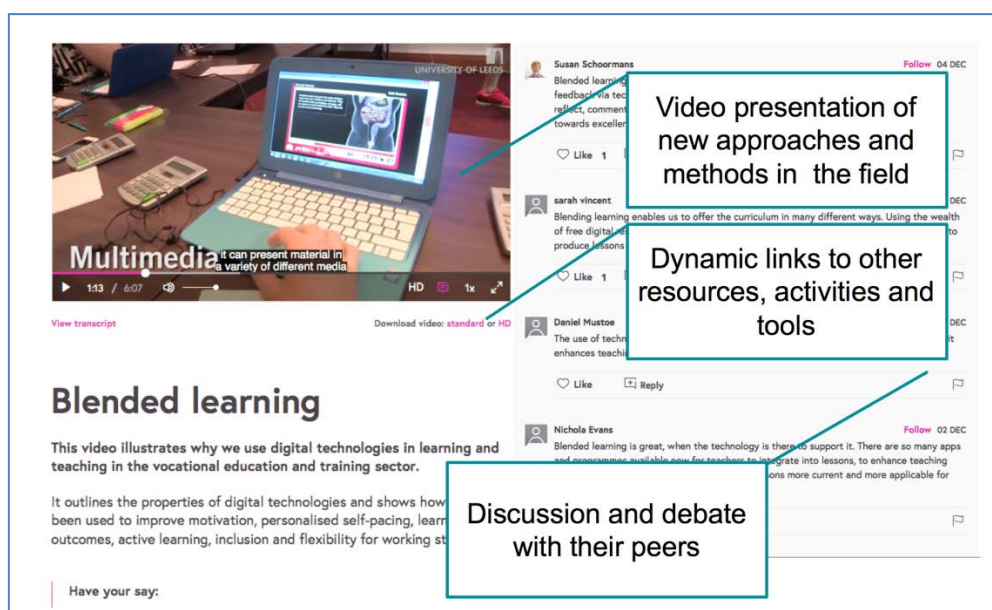
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[24] https://www.futurelearn.com/courses/blended-learning-getting-started/3/
https://www.futurelearn.com/courses/blended-learning-embedding-practice/2/

Figure 8: Screenshot of the Ufi-funded MOOC 'Blended Learning Essentials', running on FutureLearn for the FE sector

The burden of keeping up with the opportunities presented by an ever-changing technology environment, and the resulting changes to digital skills requirements, is too great for traditional personal development approaches. The MOOC provides case studies of the ways in which digital methods provide for more personalised learning, flexibility, inclusivity and productivity in teaching and training.

2.4. Strategic leadership in the sector for rapid digital progress

Current successes

The Education and Training Foundation also funded the *Two Way Street* leadership exchanges, which were derived from the CAVTL recommendation (CAVTL, 2014) to develop 'two-way street' (i.e. genuinely collaborative) strategic partnerships between employers and VET providers. These are essentially collaborative, not merely contractual, and have demonstrated the mutual benefits that derive from this.

An important lesson from the *Two Way Street* projects is that there is a willingness on the part of employers and education and training providers to communicate more effectively about employment opportunities, skills needs and training solutions if given the time and opportunity. The main findings were:

- The *Leadership Exchanges* had a strong catalytic effect when they identified a specific problem, with mutual benefit for both parties;

- It was important for the *Leadership Exchange* to have a sector-specific focus;

- When leaders are present, they drive the agenda and take actions away to inform the working practices;

- Short-term and long-term goals provided quick wins and a reason for sustainable activity;

- Success is more likely if *Local Enterprise Partnerships* are exploited;

- Leadership Exchanges can research how best to replicate successful models of curriculum, training or apprenticeship in other industry sectors.[25]

A significant feature of this project is that the '*Leadership Exchanges*' model sustained collaboration between employers and providers at the level of management and governance.

The future

The Post-16 Skills Plan recognises the importance of good leadership and governance. The **leadership exchange mode**l could help to address the 'lack of leadership' experienced by teachers as another barrier to trying to improve their digital skills and pedagogies. The success of the CPD MOOCs for teachers could be extended to trialling a professional development MOOC for leaders and governors, enabling them to learn from each other's practice and debate the complementarity between local autonomous provision and national systemic collaboration, such as the resources being offered by the Education and Training Foundation and Jisc.

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[25] Teach Too/ Two Way Street: Continuing Professional Development supporting materials: www.excellencegateway.org.uk/content/etf2325

3. Policy considerations

There is a lack of impact data in the FE sector. Jisc is beginning to track its outcomes with its 'student digital experience tracker'.[26] At present, outcomes can only be measured in terms of qualifications, so there is no opportunity to determine the relative value of innovations that are small-scale and only locally relevant. In order to have an evidence-based policy, the evidence has to be collected.

The review and analysis have been developed from published data and existing knowledge of the sector. This section considers the following recommendations for the future development of digital skills across the lifetime:

3.1. Enable pedagogic innovation

- The continual innovation in digital pedagogy needed to keep pace with demands for digital skills could be viable and sustainable through a collaborative enterprise that enables teachers and trainers to build on each other's work, share the testing of effectiveness and become more productive in their teaching (Section 2.3).
- The sector could move forward more rapidly by sharing pedagogy and building the sector's knowledge of how to develop digital skills for staff and students (Section 1.2).
- The Ufi-funded FutureLearn MOOCs on *Blended Learning* have demonstrated the feasibility of this (Section 2.3).

3.2. Develop digital skills across the curriculum

- Collaborative partnerships between colleges, training providers and employers can develop the curriculum and digital teaching methods, as in the '*Teach Too'* case studies, where SME staff are funded to train learners for authentic work skills using digital resources (Section 2.2);
- Digital skills curricula should include both the specific technical skills for a job and the generic digital literacy likely to be needed in all jobs (Section 1.1);
- Good exemplars of updating the curriculum for digital skills across the sectors, such as those offered by the '*Teach Too'* projects, could be shared as models for other sectors to follow (Section 2.2);
- Digital literacy could be included as an additional exit skill for FE sector graduates (Section 1.1).

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[26] Newman, T., Beetham, H. & Knight, S. (2016). *Student digital experience tracker 2016: results from the pilot project.* Jisc, Bristol, UK.

3.3. Update assessment methods to more digital forms

- Digital methods can be used to orchestrate peer assessment as an important formative learning process (Section 2.1);
- Digital assessment would provide models of automated and blended assessment, mixing automated, peer-reviewed and tutor-reviewed formative testing (Section 2.1);
- As learners use digital environments, they leave a digital trace in the learning analytics being collected, and these can be used for automated testing as well providing evidence of effectiveness (Section 2.1).

3.4. Support teachers in keeping their digital skills capability updated

- Build on the successful industry-provider and leadership exchange projects in the sector to establish the models as a foundation for the way the sector operates (Section 2.2);
- Open online courses for teachers and trainers have succeeded in engaging participants in greater use of blended learning, which in turn assists their learners in developing digital skills for learning (Section 2.3).
- Digital learning design tools that foster the exchange of effective digital pedagogies enable innovation across the sector to be more productive and to develop more rapidly (Section 2.3).

3.5. Support leaders and governors in developing digital innovation

- The leadership exchange model from the *Two-Way Street* project could help to address the lack of leadership experienced by teachers as a key barrier to improving their digital skills and pedagogies (Section 2.4).
- The success of professional development MOOCs for teachers could be extended to trialling a professional development MOOC to support digital strategy development by leaders and governors (Section 2.4).

3.6 Develop a policy for digital skills for the teaching and graduate workforce

- Digital literacy should be an exit skill for all FE sector graduates. The demand for the new skills of the digital workplace can only increase, which means that the sector

must be able to invest in learning through life, updating and developing adult skills in response to changing requirements (Section 1.1);

- Digital methods, if properly managed, make a significant difference to personalised learning, flexibility, inclusivity and productivity of teaching and training (Section 1.2);

- The planned move to local autonomy for colleges and other training providers could be supplemented with sector-wide collaborative provision of online courses that can be tutored locally, thereby offering a wider range of provision at the local level (Section 2.1);

- Investing in the professionals to use digital learning innovations to develop, test, peer review, publish and share their effective practices would build a self-sustaining learning system as the heart of the future development of the sector.

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