STRATEGY FOR

TECHNOLOGY–ENHANCED LEARNING IN FURTHER EDUCATION AND TRAINING 2016–2019

Support Connect Inspire

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Education and Training Boards Ireland
Boird Oideachais agus Oiliúna Éireann

SOLAS
An tSeirbhís Oideachais Leanúnaigh agus Scileanna
Further Education and Training Authority

TECHNOLOGY-ENHANCED LEARNING

USING TECHNOLOGY TO FACILITATE AND SUPPORT INNOVATIVE TEACHING AND LEARNING PRACTICES

ACKNOWLEDGEMENTS

This strategy has been developed with the participation and assistance of many individuals and organisations. In particular, we would like to express our appreciation to:

- The dedicated ETBI group advising on the strategy and chaired by Cynthia Deane, Chief Executive Kilkenny and Carlow ETB (See Appendix 1)
- ETB Chief Executives and colleagues
- Employer groups and representatives
- More than 100 organisations and individuals who responded to the online consultation on the strategy
- H2 Learning Ltd

We look forward to working with all partners in implementing the strategy.

Success in implementing this strategy will result in:

- Learners who are skilled and confident in using technology as part of their work, study and home life
- Technology being used appropriately as part of all teaching and learning
- Significant improvement in access to further education and training
- Learners being more engaged, and achieving more from their learning.

FOREWORD

Further education and training is in a period of exciting change and development in Ireland. Following large-scale reform over the past two years we have made substantial progress in consolidating resources and investment and in establishing an enhanced mission and direction for the system.

This first strategy for technology-enhanced learning contributes to the development project underway. The strategy spans the further education and training system as a whole and builds on the excellent practice that already exists. It supports the overarching strategy for further education and training 2014–2019 and the goals to provide skills for the economy, active inclusion, quality provision, progression to integrated planning and funding and to improve the overall standing of further education and training in Ireland. It also aligns Ireland with leading practice on technology-enhanced learning in Europe and further afield.

The strategy includes a number of examples of existing practice; these are just a snapshot of the ways in which technology is being used to engage learners and to ensure a high-quality, relevant learning experience. The challenge ahead is to establish this practice as universal, where technology is being used appropriately as part of all teaching and learning and learners are skilled and confident in using technology as part of their work, study and home lives.

There was a strong response to an online consultation on the strategy, with over a hundred responses from individuals and groups who included teachers, learners, employers and representative networks and groups. All underlined the importance of embedding technology within further education and training, to benefit learners, teachers and employers and to enhance a whole range of educational and vocational outcomes from the learning experience.

The online responses also underlined the importance of systematic investment to ensure that technology to enhance learning is universally available, that teachers are able to use it effectively and with confidence, and that it continues to act as a dynamic support to the teaching and learning endeavour. The strategy aims to achieve this, through implementation of eighteen practical actions, grouped under three strategic themes of building on existing capacity, expanding access and continuous improvement and innovation.

The experience of developing this strategy was a very positive one, with engagement by a wide range of stakeholders through an ETBI/SOLAS advisory group, working meetings with representative groups, and the online consultation process.

We look forward to similar strong engagement and success in implementing the strategy.

Paul O'Toole
Chief Executive
SOLAS

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An tSeirbhís Oideachais Leanúnaigh agus Scileanna
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1 INTRODUCTION

VISION

By 2019, technology-enhanced teaching and learning is providing greater access to further education and training and is achieving positive outcomes for learners, enterprise, and our wider society and economy.

This strategy aims to establish technology-enhanced learning as an intrinsic element of further education and training in Ireland. The strategy has been developed through a consultative process with learners, with colleagues in Education and Training Boards (ETBs), with the enterprise community and with colleagues in other parts of the education and training system. It supports and complements the *ICT Strategy 2016* developed by ETBs; the *2013 National Digital Strategy for Ireland*; the *2015 Public Service ICT Strategy*; the overarching *Further Education and Training (FET) Strategy 2014–2019*; the *National Skills Strategy 2025*; the 2015 *Digital Strategy for Schools*; and the *Digital Roadmap for Higher Education*. The strategy also draws on examples of good practice in the use of ICT to enhance teaching and learning from Ireland and around the world.

Technology is increasingly part of how we live and thrive in our day-to-day lives. The 'internet of things' has become a reality, where everyday tools, services and other objects are designed and connected digitally, and people need digital competence in order to access and benefit from these innovations. In modern education and training, it is essential that all learners are equipped to understand and exploit the full advantages of technology in their work, at home and within their communities.

Technology can be used to enhance learning on initial engagement, as part of course delivery and assessment, and in supporting career progression. Learners may access technology in all course areas and models of provision, including in-class, full- or part-time provision, blended learning and exclusively on-line learning.

Within education and training, new opportunities created by technology are transforming learning experiences and outcomes. There has been an explosion in the availability of IT software and systems; ways of developing, storing and retrieving learning resources; infrastructural supports; and use of the internet to enhance the learning environment, regardless of where teachers[1] and learners are located. The appropriate use of technology allows people to decide when and where they learn. Technology can also facilitate high-quality, individualised feedback between teachers and learners. Individuals can interact and share learning in online learning groups and communities of practice. Complex concepts can be illuminated using simulated and virtual worlds. Technology has transformed access, meaning location is no longer an issue, and barriers which were previously created by distance, disability, illness, for those with caring responsibilities, or those in part- or full-time work can be overcome.

Through eighteen practical actions, grouped under three themes, this strategy aims to build on existing capacity and establish technology-enhanced learning as an intrinsic part of further education and training in Ireland.

Success in implementing this strategy will mean that by 2019, all learners and teachers in further education and training are using technology to support exciting, high-quality learning and achievement.

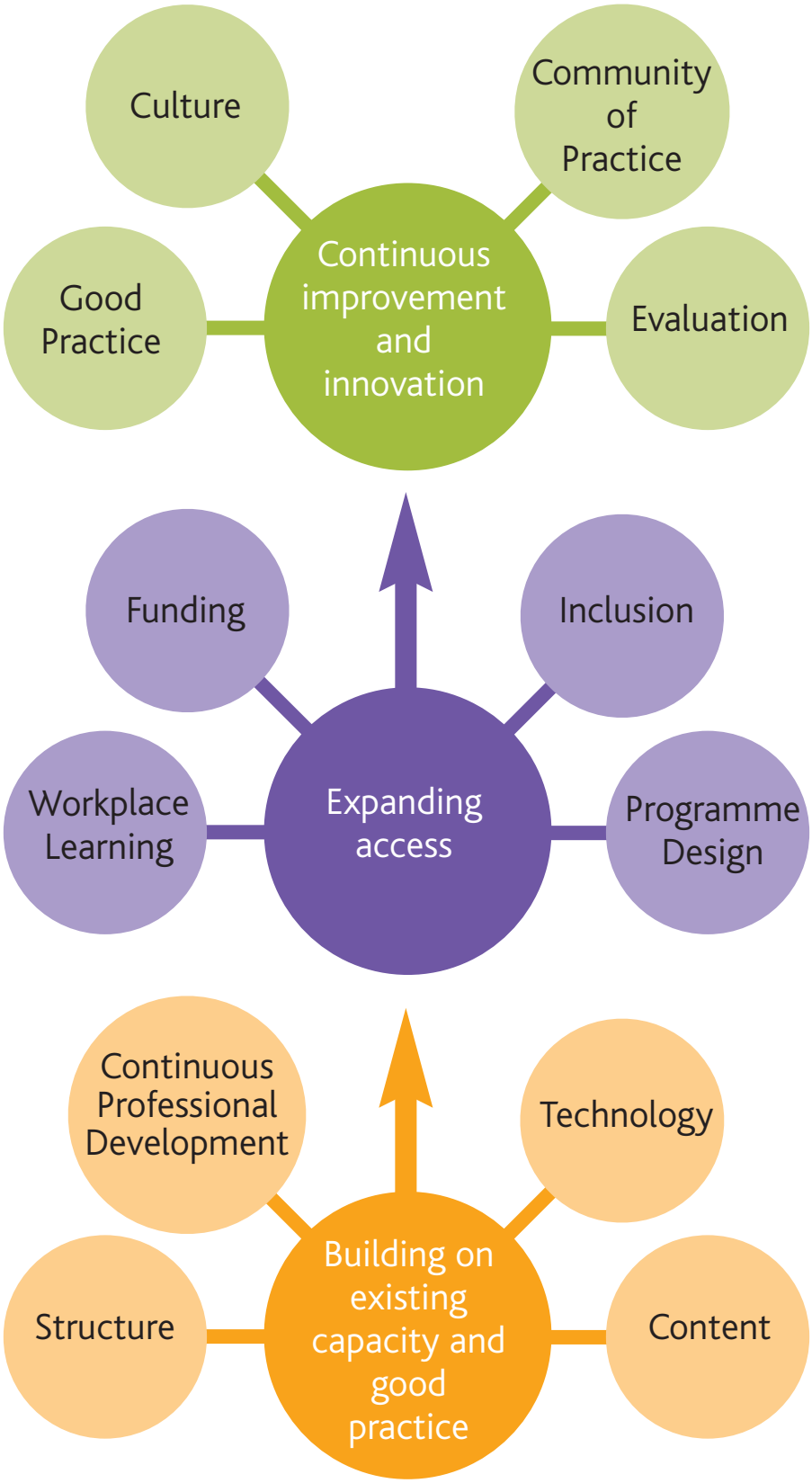
Key partners in achieving the strategy are learners and teachers within each of the sixteen Education and Training Boards (ETBs), community education and training centres and other providers, supported by management and administration colleagues.

SOLAS will support and facilitate achievement of the strategy through its funding and co-ordinating responsibilities, and there will be close liaison with teams working on national initiatives to build shared service platforms and technology infrastructure.

[1] The term 'teachers' in this document is used to encompass all learning practitioners employed in the facilitation of learning including teachers, tutors, trainers, instructors and mentors who support learners within the further education and training system in Ireland.

2 STRATEGIC ACTIONS

Eighteen actions, grouped under three strategic themes are proposed for the next four years 2016-2019. These actions have been developed with reference to the strategies and policies that steer the further education and training system, in particular the *Further Education and Training Strategy 2014-2019*, the *National Skills Strategy 2025* and the *Education and Training Boards ICT Strategy 2016*.



THEMES AND ASSOCIATED ACTIONS

IMPLEMENTATION PLAN

Theme 1 Building on existing capacity and good practice

Actions within this theme aim to embed a systemic culture, structures and practices so that technology-enhanced learning becomes an intrinsic part of further education and training in Ireland. To ensure success, a set of interconnected elements are required. These are: staff with technologically-appropriate pedagogical skills and confidence; access to digital learning content and resources; appropriate technology infrastructure and supports; and high-quality programme design and assessment. Each component relies on the other and each must be in place in order to avoid the challenges that have at times been reported as part of the adoption of technology in education and training around the world. SOLAS will work closely with the Department of Education and Skills (D/ES) as part of implementation of the strategy.

Actions	Performance indicator	Lead and Partners	Proposed Timescale
1.1 Promote the advantages and benefits of technology-enhanced learning locally and nationally.	Each ETB, as well as SOLAS, has an ongoing awareness and promotion campaign as part of implementation of the strategy.	SOLAS, ETBI, ETBs	Q2 2016, ongoing
1.2 Establish a 2016 baseline of technology-enhanced learning provision within each Education and Training Board (ETB), using a shared benchmarking exercise.	Each ETB has completed a shared benchmarking exercise, covering a range of topic areas.	ETBs, SOLAS	Q2 2017
1.3 Develop an action plan within each ETB using headings which identify organisational requirements, to include: (i) Infrastructure, including ICT (ii) Pedagogy and ongoing CPD (iii) Content creation, access and sharing (iv) Organisational structures and practice.	All ETBs are implementing an action plan for technology-enhanced learning and accompanying quality assurance procedures.	ETBs	Q4 2017
1.4 Equip all further education and training learning centres with appropriate broadband and Wi-Fi capacity.	All ETB locations have appropriate broadband and Wi-Fi services in place.	SOLAS, ETBI, ETBs	Q1 2018
1.5 Develop and implement a 'Bring Your Own Device' (BYOD) strategy.	BYOD strategy implemented in each ETB.	ETBI, ETBs	Q2 2017
1.6 Identify and roll out IT infrastructure and supports, including VLE (Moodle), content management, virtual classroom and IT service supports.	Each ETB has access to a VLE and appropriate IT support services to support teaching and learning on all courses.	SOLAS, ETBs	Q2 2018
1.7 Implement CPD opportunities as identified in the national skills profiling exercise and overarching CPD strategy for further education and training in conjunction with local CPD and action plan / strategies and make recommendations for the inclusion of digital skills in initial teacher education and training.	Successive skills profiling evaluations indicate continuing improvement in levels of digital confidence and skill among teachers.	ETBs, SOLAS, Further Education Support Service (FESS)	Q1 2017 and ongoing
1.8 Procure learning content and resources and development supports tor use by all further education and training teachers.	Framework agreement in place for learning content. Resource provision is available and in use by all ETBs.	SOLAS, ETBs	Q1 2017
1.9 Develop a content sharing and management infrastructure to facilitate sharing and development of learning resources among all teachers.	Learning content management system in place and in use with workflows for content access, development and sharing.	SOLAS, ETBs	Q2 2017
1.10 Develop shared e-Portfolio platform and procedures for technology-based assessment methodologies.	Shared ePortfolio system in place for all ETBs. Online assessment methodologies included in ETB quality assurance procedures.	ETBI, SOLAS	Q4 2017
1.11 Expand development and support staff as appropriate to support technology-enhanced learning within ETBs.	Learning technology and IT support staff are in place in each ETB location	SOLAS, ETBI, ETBs	Q1 2017

Theme 2 Expanding access

The actions within this theme aim to expand access to further education and training for people who need flexible learning opportunities. Target groups include those in employment who wish to/need to upskill and those disadvantaged due to their circumstances such as their remote location, personal situation or a disability.

Actions	Performance indicator	Lead and Partners	Proposed Timescale
2.1 Use the further education and training funding model to support and incentivise technology enhanced learning.	Funding is being accessed by all ETBs for new approaches to delivery. Surveys of learners indicate increasing levels of engagement and positive feedback.	SOLAS, ETBs, ETBI	Q4 2016
2.2 Increase the use of digital technologies as part of work-based learning (apprenticeship, traineeship, Skills for Work and other work-based learning).	Digital technologies are a part of all work-based learning provision. Surveys of learners engaged in work-based learning indicate increasing levels of engagement and positive feedback.	SOLAS, ETBs, other education and training providers	Q1 2017
2.3 Develop and implement guidelines for technology-enhanced learning as part of local and national quality assurance in curriculum and assessment development, delivery and evaluation.	Surveys of ETB personnel indicating a high level of support and satisfaction with local and national quality assurance.	QQI, SOLAS, FESS	Q2 2017
2.4 Use funding and supporting guidelines to promote access and active inclusion through use of technology, in particular for learners with disabilities, those with few or no previous qualifications or low levels of digital, numeracy or literacy skills; and those in remote or distant locations.	Increased participation of target groups in FET courses.	ETBs, SOLAS	Q2 2017

Theme 3 Continuous improvement and innovation

Actions within this theme aim to support continuous improvement in provision of technology-enhanced learning, drawing on national and international policy and good practice. Collaboration with the wider education and training system – primary, post primary and higher education, as well as with the enterprise community – will support high-quality, expert teaching and learning.

Actions	Performance indicator	Lead and Partners	Proposed Timescale
3.1 Use technology to enhance communities of learning and practice (COP) among teachers and learners.	Doubling of numbers of communities of practice in place relative to 2016 benchmarking exercise.	ETBs, ETBI FESS	Q2 2017
3.2 Share good models of practice on technology-enhanced learning regionally, nationally and internationally, as well as research on emerging trends (such as the increasing role of informal learning and use of social media in formal settings).	Annual increase in index of conferences and published papers. All partners engaging in TEL conferences and events that support ongoing improvement in quality of service.	ETBI	Ongoing
3.3 Monitor and evaluate progress locally and nationally to learn from what works and continuously improve policy and practice.	Local and national evaluation reports show steady increase in provision and effectiveness of technology-enhanced learning.	ETBI	Q4 2017 and ongoing

3 BUILDING ON PROGRESS: NATIONAL AND INTERNATIONAL CONTEXT

"Technology is a power lever in engaging and releasing the potential of all learners. A new era in information literacy and technological competence creates new frontiers in economic and social opportunity. Ireland needs to lead out on this. It is a real opportunity."

Representative from enterprise responding to the strategy proposals

"My education doesn't end when I leave college each day. Having Moodle at my fingertips, I now have access to teachers, resources and assignments and can view, read, watch and discuss online. It makes my learning very personal to me – I am now responsible for what I learn and where I learn it. […] Having had this opportunity to come back and learn new and exciting skills, I now feel part of the technology generation. It has given me an opportunity to be part of the next generation of technology-savvy workers."

CB, Limerick and Clare ETB learner

NATIONAL CONTEXT

The further education and training community in Ireland is keenly aware of the central role technology now plays in our society and economy and of the need to ensure that all learners have opportunities to build their digital skills and competence, as well as to benefit from the application of technology in further education and training programmes. Learners have been able to access both fully online and blended learning courses, with teachers and tutors using the most up-to-date software and infrastructure to enhance the learning experience. The latest assistive technology has been introduced in many locations, and there are numerous examples of good practice in the application of technology to enhance learning.

This experience, however, has not been universal. Not all education and training centres have the required infrastructure to provide technology-enhanced learning, such as appropriate broadband or Wi-Fi. In addition, a relatively small number of teachers have accessed opportunities to increase their digital skills and knowledge.

Respondents to a 2015 SOLAS/ETB self-evaluation survey on their skills profile reported having the least amount of confidence about the use of ICT and the use of technology to enhance learning. Technology-enhanced learning had the smallest share of staff reporting a high level of confidence (29.4%) while also reporting its relevance to their role as a teacher (92.3%) or manager (91.2%).

Learning content and resources have also been identified as an area in which technology can improve the quality and consistency of course provision. Online and blended learning courses require learning materials that make best use of multimedia and the internet. Shared access to learning content reduces duplication of effort in developing learning resources and increases both the quality and reusability of materials.

Surveys such as the Digital Economy and Society Index (DESI) and the Programme for the International Assessment of Adult Competencies (PIAAC) survey of adult learners underline the need for Ireland to invest further in technology-enhanced learning and digital skills. The (DESI) is a composite index that summarises thirty relevant indicators on Europe's digital performance. As set out in Figure 1 below, at 78%, Ireland has a high rate of internet use amongst its population. There are, however, significant gaps in digital skill levels, with only 44% of the population reporting sufficient digital skills to operate effectively online.

Figure 1. Extract from Digital Economy and Society Index (DESI) Survey 2016.[2]

	Ireland					EU
	DESI 2016			DESI 2015		DESI 2016
	Value		Rank	Value	Rank	Value
2a1 Internet Users % individuals (aged 16–74)	78% (2015)	↑	12	76% (2014)	13	76% (2015)
2a2 Basic Digital Skills % individuals (aged 16–74)	44% (2015)	↓	22	53% (2014)	20	55% (2015)
2b1 ICT Specialists % employed individuals	4.6% (2014)		9	4.6% (2013)	8	3.7% (2014)
2b2 STEM Graduates Graduates in STEM per 1,000 individuals (aged 20 to 29)	22 (2013)		5	22 (2012)	3	18 (2013)

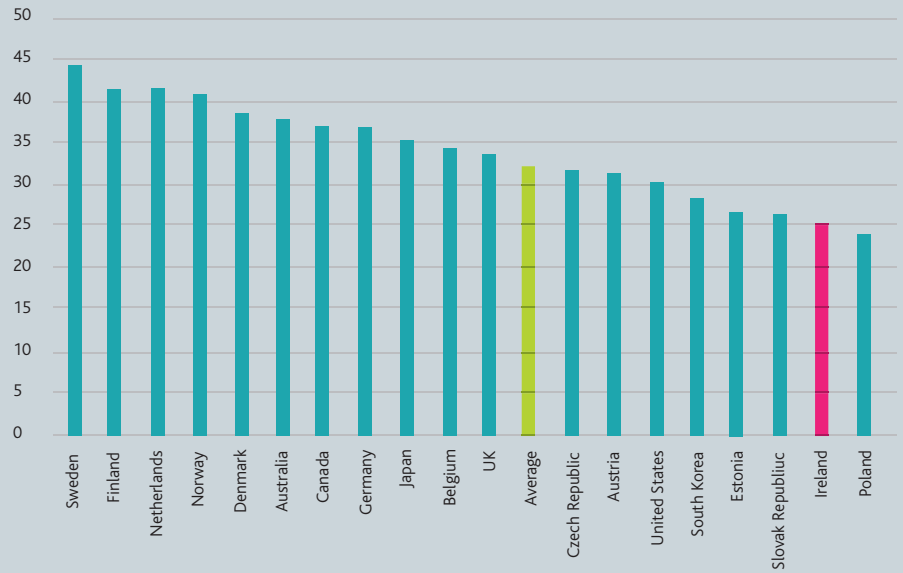
Figure 1 also indicates that the proportion of ICT specialists in employment in Ireland is relatively high, at 4.6%, and that the proportion of STEM (Science, Technology and Mathematics) graduates is above the EU average. However, the survey also records that Ireland needs even more skilled ICT professionals than are currently available. The demand for skilled ICT professionals has been rising, while the supply is not keeping pace, with around half of enterprises trying to employ ICT specialists in Ireland reporting difficulties in doing so. Under the indicator 'integration of digital technology by businesses', Ireland is ranked in the top three of EU countries.

In the most recent international survey of adult skills, PIAAC 2013 placed Ireland eighteenth out of nineteen countries on 'problem-solving skills in technology-rich environments'. PIAAC assesses the prevalence of key cognitive and workplace skills needed for adults 'to participate in society and for economies to prosper'. In Ireland, fewer than 25% of adults scored at or above level two on the problem-solving scale, as set out in Figure 2 below.

Taken in conjunction with the DESI Index, Ireland's PIAAC score indicates a need for improvement in the digital competencies of adult learners, providing a major opportunity and challenge for further education and training. Technology-enhanced learning not only enhances learning provision, but also develops digital skills.

[2] https://ec.europa.eu/digital-agenda/en/scoreboard/ireland.

Figure 2. Percentage of adults (16–65) at or above level 2 in problem solving in technology-rich environments.[3]



The commitment to creating a digitally-savvy, competent population and workforce underpins the recently published *National Skills Strategy 2025*:

Technology is one of the key drivers of change and improved digital skills will be vital for Ireland's future, both in higher-end dedicated ICT jobs and, more widely, as a basic core competence.

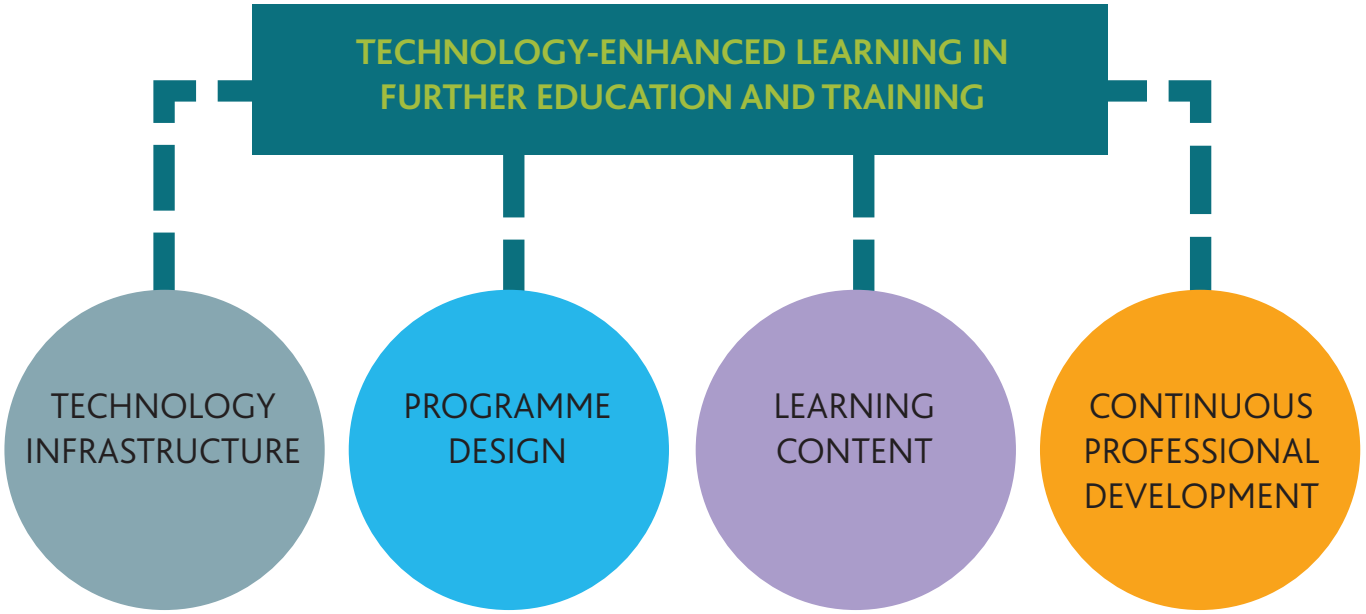
P.10

A range of other national policies and initiatives support innovative practice. In 2013, ***Doing More with Digital***, a first digital strategy for Ireland, was published by the Department of Communications, Energy and Natural Resources. As well as underlining the importance of building digital capacity in Ireland, the strategy presents education and eLearning as one of four priority areas for development. Digital strategies for schools and for higher education have been published over the past two years. Implementation of these strategies includes the gathering and dissemination of examples of the transformative power of technology within the entire education and training system in Ireland, for teachers as well as learners.

Technology-enhanced learning (TEL) fits well within the dynamic, diverse culture and practice of Irish further education and training (FET), spanning learners from a wide range of age groups and demographic backgrounds. It also supports the identity and values of a rapidly developing and evolving system.

[3] Taken from Figure 2.13: http://skills.oecd.org/documents/OECD_Skills_Outlook_2013.pdf.

Figure 3. The four elements of technology-enhanced learning



Through the consultation process, four interconnected areas for development were identified:

(i) **programme design** – building innovative approaches such as the flipped classroom; 'bring your own device'; blended learning; social media; interactive, individualised learning plans; feedback mechanisms and assessments into FET programmes as appropriate.

(ii) **learning content** – eBooks; video; virtual animations; simulations and eLearning resources supporting the course learning outcomes as appropriate for the subject area or client group across the full spectrum of FET provision.

(iii) **continuous professional development** – building expertise and confidence in using technology to teach and to enhance learning for existing staff and as part of initial teacher training.

(iv) **technology infrastructure** – broadband and wireless internet and network access; virtual learning environments; collaborative online communities of learning and practice; internal content management systems; course calendaring; learner registration and learner support system software that should be integrated so as to reduce the duplication of effort currently in place. The need to prioritise funding based on metrics for return on investment was also highlighted.

These four elements must be developed in parallel in order to successfully embed technology-enhanced learning. This approach is supported by leading practice internationally; for example, the technological pedagogical and content knowledge (TPACK) initiative has emerged as a clear and useful construct for researchers working to understand technology integration in learning and teaching.[4]

[4] http://www.tojet.net/articles/v10i4/10437.pdf

SAMPLE FEEDBACK FROM ONLINE CONSULTATION PROCESS
MARCH 2016

I use technology a lot in my teaching practice: EdPuzzle.com is a wonderful site that allows you take a video such as, for example, a TED talk and insert it into an interactive classroom page. From there it can be punctuated by questions relevant to the talk and wider topic. It allows for the head to come out of books and off pages and to engage with some of the world's finest communicators.

Computer science, programming and computational thinking are ways of thinking and problem solving. They need to be taught as a skill and a methodology and woven into as many different course subjects as possible.

The strategy has excellent potential as regards enabling and empowering people from our most rural to urban locations to access comparable further education and learning possibilities.

Technology offers the tools and means for learners to engage in learner-driven and inquiry-based learning and a platform for enhanced learner collaboration or cooperation – skills critical for the 21st century.

It is important to emphasise that technology-enhanced learning goes well beyond access and digital literacy. It has significant potential to boost learner engagement, interest and understanding of subject material through a practical and activity-based approach to learning.

As a general rule, the education environment should mirror life and we now live in a digital world where technology is a major part of our working lives. Therefore it can be challenging – particularly for young learners – to stay engaged in an education environment where technology is absent and/or its use is limited to isolated pieces of work.

INTERNATIONAL CONTEXT

On the international stage, many countries are actively working to embed technology in their education and training systems, as an enhancement of existing provision and as a means of ensuring that citizens have the required digital skills and knowledge to compete on a global stage. Countries such as Australia, the United States, Israel and the United Kingdom are well-advanced in their policies and practice, with college-specific, regional and national strategies in place for ten years and longer. Research and evaluation reports from these countries identify shared trends in learning and experience.

The importance of teachers and of expert pedagogy is underlined repeatedly. So too is the involvement and feedback of learners in shaping emerging policy and in how and where technology is used to best effect. The New Media Consortium (NMC) 2016 Horizon report 2016[5] identifies trends and challenges in technology adoption facing education and training providers worldwide. These trends are summarised in Figure 3 below.

Figure 4. Key trends and timelines: extract from New Media Consortium 2016

Time to Adoption	Key trends
Short-Term: (one to two years)	Growing focus on measuring learning Increasing use of blended learning designs Bring your own device (BYOD) Learning analytics and adaptive learning
Mid-Term: (three to five years)	Redesigning learning spaces Shift to deeper learning approaches Augmented and virtual reality Makerspaces
Long-Term: (five or more years)	Advancing cultures of innovation Rethinking how institutions work Affective computing Robotics

Time to Adoption	Key trends
Solvable: Those that we understand and know how to solve	Blending formal and informal learning Improving digital literacy
Difficult: Those that we understand but for which solutions are elusive	Competing models of education Personalising learning
Wicked: Those that are complex to even define, much less address	Balancing our connected and unconnected lives keeping education relevant

[5] http://cdn.nmc.org/media/2016-nmc-horizon-report-he-EN.pdf.

Organisations including the OECD, UNESCO, the European Commission and the World Bank have published strategy and policy frameworks on integrating technology and digital capacity in national education and training systems and other public services. There is a repeated message that the future prosperity and competitiveness of a country is closely connected to the digital skills and competencies of its people and in how digital resources and innovations are exploited.

Global trends are emerging, which include initiatives to integrate technology into the classroom; use collaborative learning platforms to share and expand knowledge; teach programming and advanced computing skills; and implement self-paced and personalised e-Learning and assessment.

Impact of technology-enhanced learning

There is growing international evidence on the outcomes supported by digital technologies. The '*Joint Information Systems Committee*' (JISC), a UK not-for-profit organisation working on digital innovation and research, has compiled evidence of significant learner benefits from technology. These include improved learning experiences; enhanced skills and employability; and enhanced satisfaction, motivation and retention.[6]

In 2015, the Scottish government commissioned a literature review on the impact of digital technology on learning and teaching.[7] The review presented:

- **Conclusive evidence** that digital technologies can support educational attainment in general and improvements in numeracy, mathematics and science learning in particular.
- **Indicative evidence** that digital technologies can support educational attainment in literacy and closing the gap in attainment between groups of learners.
- **Promising evidence** that digital technologies can provide assistance in overcoming the challenges faced by some learners; improvements in employability skills and knowledge of career pathways; improved communications with parents; and time efficiencies for teachers.

In common with other research in the area, however, the Scottish review highlighted that the introduction of technology on its own does not necessarily have a positive impact on learning:

> *"[…] Successful implementation requires support to teachers in the form of opportunities to learn (both formally and informally), embedding digital learning in continuing professional development and initial teacher training, direction and leadership within a school, functioning digital equipment and tools, and an environment that gives teachers the flexibility to introduce and use digital learning."* ***(p.44)***

[6] http://www.academia.edu/1323643/CAMEL_Tangible_Benefits_of_E-learning_Project.
[7] http://www.gov.scot/Resource/0048/00489224.pdf.

4 LEARNERS' VIEWS

Using technology to facilitate and support innovative teaching and learning practices.

Feedback from learners around the world underlines the importance they accord to technology-enhanced learning. JISC has gathered feedback from learners on the impact of technology in assessment, where technology-enabled learning and assessment that were more transparent, more uniform and fair. Technology provided more opportunities to learn by practising assessment tasks and much greater levels of feedback on performance and achievement.[8] Learners expect to learn using technology, they want to use their own devices, they want to use social media as part of their learning and they want more flexibility where and how they learn.

Feedback from other key stakeholders is also positive. Employers report their experience of meeting job candidates who are more work-ready, and more able to engage with and use essential technology in the workplace. The role of technology in preparing learners for employment is underlined in the 2012 McKinsey report *Education into Employment: Designing a System that Works*, which shows that the top-performing schools and colleges are innovating constantly with the internet and with the latest software available.[9]

Within education and training systems, practitioners are charting the advantages 'tech-savvy' learners have as they progress through their studies and into employment or within employment, as well as noting the growing expectations learners have about technology supports during their studies.

It is probably fair to say that, while not currently a leading country in technology-enhanced learning, Ireland is nevertheless well-positioned to make strong advances over the next three-to-five years. A significant programme of reform and development is underway within the education and training system, with a strong drive to support high quality, twenty-first century teaching and learning.

LIMERICK AND CLARE ETB (LCETB) CASE STUDY – TECHNOLOGY-ENHANCED LEARNING FOR WORKPLACE LEARNING AND EMPLOYABILITY SKILLS

Technology-enhanced learning in the workplace

In LCETB a number of initiatives and developments highlight how the use of technology is increasingly tailored to cater for the specific requirements of learners in the workplace.

Limerick Basic Education Service developed an online programme to help prepare taxi drivers for the national online SPSV Industry Knowledge Exam. The online course is used as part of blended learning programmes by ETBs country-wide.

In Clare, a Skills for Work online herd registration training project gives farmers the confidence and skills to complete online herd registration and create animal movement certificates. The project started as a pilot in County Clare and now has a national uptake, with training delivered in small groups by ETB adult literacy tutors. The approach of using an online practice environment blended with face-to-face delivery has proven to be so successful that it is now used with learners in a diverse range of careers such as firefighters and cleaners.

ePortfolios and Digital Badges

LCETB is currently using ePortfolios and digital badges as part of a project to develop innovative approaches for employability skills development with VTOS learners. The project aims to improve progression opportunities for learners by using technology to record, recognise and share learners' accomplishments and achievements.

In addition, LCETB apprentices are being supplied with tablets to access training content and create ePortfolios as part of the new apprenticeship programmes.

[8] http://www.academia.edu/1323643/CAMEL_Tangible_Benefits_of_E-learning_Project.

[9] http://mckinseyonsociety.com/downloads/reports/Education/Education-to-Employment_FINAL.pdf.

EXAMPLE: GALWAY AND ROSCOMMON ETB

Adult Literacy: What's the Story?

Developed in Galway and used by adult learners, this web-based application is used to improve spelling, syntax, grammar, reading and comprehension. Learners have to guess the words in a story to complete it, then type it in using the on-screen keyboard. This programme has had a very positive response from learners and tutors, who are using this resource in a variety of ways. All stories on the site are written by learners.

Log on to e-learn

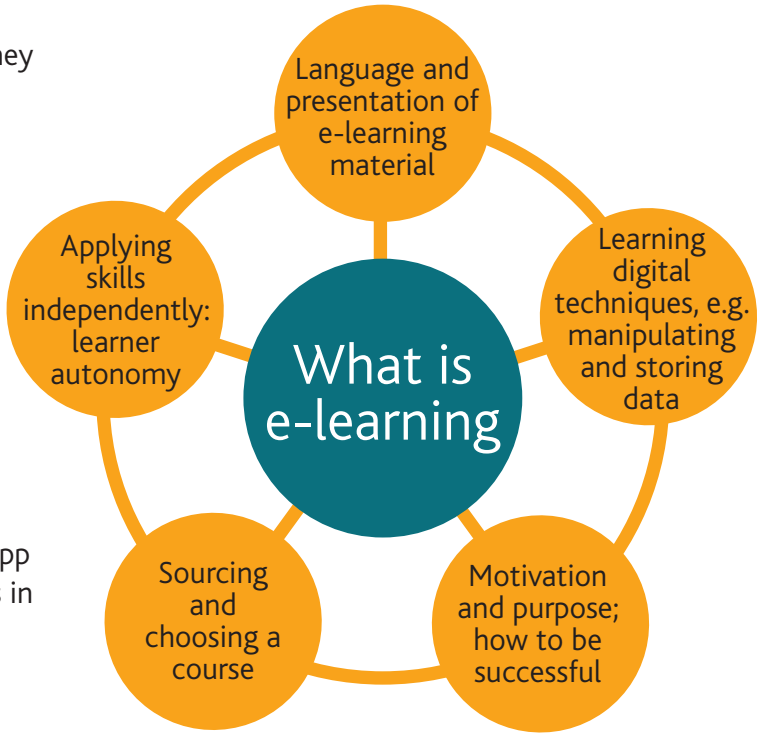
Learners in Galway, having access to a computer room, wanted to undertake an online course, but lacked the confidence and the knowledge to do this. So they were introduced to the concept and practice of online learning via this four-week introductory course that combined instructor-led and online teaching and introduced learners to the language and methods of online learning. Sample online tasks were a feature of the course and learners also logged on at various times when they were away from the computer room, something they enjoyed immensely.

Book Creator projects using iPads

Learners are encouraged to write about their hobbies or interests in the iPad Book Creator app. They add photos and videos taken directly using the iPad's camera. Learners can also narrate or add comments to their books via the audio feature. This process has tapped into the imaginations and creativity of many students so far. Additionally, tutors are using the Book Creator app to create multimedia books for use as textbooks in the classroom, written for purpose.

Apprentices and study skills

Apprentices have been introduced to the free app, Quizlet.com with which they can create tailor-made flashcards to help them study for exams. Using Quizlet on the mobile phone makes learning and revising highly accessible and immediate.



EXAMPLE: SOLAS eCOLLEGE

eCollege has delivered online courses to over 90,000 learners since 1998. The service has constantly improved and changed in line with technological developments and adoption of best practice, based on both learner feedback and international research. Some of these developments include:

- **Content Development:** Initially, eCollege employed learning content developers (instructional designers, animation and graphic designers and the use of subject matter experts and eLearning content development tools) to develop all learning content for courses. Over time issues, with intellectual property rights, time to develop new courses, quality of content and alignment with certification learning outcomes resulted in a decision to outsource content development and to procure off-the-shelf content from external providers, where possible.

- **eTutor Support:** Prior to the introduction of an eTutoring service, online learner satisfaction indicated a high level of satisfaction with courses based purely on eLearning content. Following the introduction of a tutor-supported service, there was only a marginal increase in learner satisfaction. However, as this service was introduced in stages, learners that previously had access to eTutor supported courses progressed to courses without tutor support; learner satisfaction fell dramatically and led to complaints over the poor level of service. This led to the introduction of tutor support for all courses and a recognition that surveying existing learners is not necessarily the best route to improvements in service.

- **ICT Platform:** When eCollege started, it commenced development of a bespoke Learning Management System in response to issues related to the complex licensing and expense of commercial systems. However, after years of development it was decided to switch over to an off-the-shelf open source system that had the advantages of a worldwide community of developers and a stable, tried and tested platform that was widely used and which has increased in use exponentially over the years. Moodle was adopted; this has facilitated the focus of the unit on customising integration with IT systems and on customisation of an analytic reporting and structured implementation of worldwide developments.

- **Horizon Scanning:** Virtual classrooms are an example of a technology that had been introduced to the market for a number of years before being adopted by eCollege. Technology traditionally goes through a life-cycle of adoption, and in the case of virtual classroom, this included the increase in broadband speeds of learners and improvements in architecture of the systems until they became a realistic option for the majority of eCollege users. It was only when this level of maturity was reached that the technology was introduced to the eCollege platform.

APPENDIX 1

ETBI ADVISORY GROUP ON STRATEGY FOR TECHNOLOGY-ENHANCED LEARNING

Cynthia Deane	Chair of group, Chief Executive Kilkenny and Carlow Education and Training Board
Michael Carr	Donegal Education and Training Board
Brendan Ryan	Limerick and Clare Education and Training Board
Joe English	Cavan and Monaghan Education and Training Board
Liam Burke	Cork Education and Training Board
Pat O'Mahony	Education and Training Boards Ireland
Alison Jones	Galway and Roscommon Education and Training Board
Carol McCarthy	SOLAS
Colm Mc Evoy	Kerry Education and Training Board
Eithne Nic Dhonnchadha	Galway Roscommon Education and Training Board
Jim Wadden	SOLAS
Mary Sheehy	Further Education Support Service
John Kearney	Cavan and Monaghan Education and Training Board
Mary-Liz Trant	SOLAS
Michael Foley	Dublin and Dun Laoghaire Education and Training Board
Michael Mooney	SOLAS
Miriam O Donoghue	Further Education Support Service
Paddy Nolan	SOLAS

APPENDIX 2

ONLINE CONSULTATION PROCESS MARCH 2016

There were over 100 respondents to an online consultation process on the strategy which included:

Individual Institutions from each ETB
Teach Tech Support
Trade Unions – SIPTU, Mandate, IMPACT
Computers in Education Society of Ireland
SOLAS
Expert Group for Future Skills Needs
An Cosán Virtual Community College
IBEC
Irish National Organisation of the Unemployed
Individual learners
ISME
NALA
FIT Ltd.
A Services
MediasKool
Down Syndrome Tipperary
North side Partnership
Chambers Ireland
Pobal
Private training providers (inc. Chevron Training & Recruitment Limited, Pulse College, Hi-Tech Associates)
National College of Ireland
ICS Skills

APPENDIX 3

TECHNOLOGY-ENHANCED LEARNING – SELECTED GLOSSARY AND NOTES

Technology enhances learning by enabling:

✔	24/7 access to learning resources and assessment instruments
✔	learning content sharing and co-authoring
✔	greater choice over the time, pace and place of study
✔	increased access through variety in modes of delivery: online and combinations of blended learning, including various mixes of work-based, online and centre-based learning
✔	opportunities for reflection and planning and increased personalisation of learning
✔	rapid feedback on formative assessments
✔	more active learning by means of interactive technologies and multimedia resources
✔	participation in communities of knowledge, inquiry and learning
✔	learning by discovery in virtual environments
✔	development of skills for living and working in a digital age.

In the table below, a range of methodologies, tools and terms commonly used in technology-enhanced learning are set out.

TERM	DEFINITION
Blended Learning	Blended learning is a formal education programme in which a student learns at least in part through delivery of content and instruction via digital and online media with some element of student control over time, place, path, or pace, incorporating some level of face-to-face provision.
BYOD	Bring Your Own Device (BYOD) allows learners to bring their own devices, especially tablets and mobile phones, into classrooms to support learning.
Cloud-Based Tools or Services	This is essentially a metaphor for software, platforms and infrastructure that are found and used on the internet.
Continual Professional Development	Also known as staff development, this is where the staff of an institution is provided with appropriate instruction and training.
eLearning	Learning facilitated and supported through the use of information and communications technology.

APPENDIX 3

TECHNOLOGY-ENHANCED LEARNING – SELECTED GLOSSARY AND NOTES

TERM	DEFINITION
e-Portfolio	An ePortfolio (electronic portfolio) is an electronic collection of evidence that demonstrates evidence of a learning journey over time. Portfolios can relate to specific academic fields or lifelong learning.
Learning Analytics	This is an educational application of web analytics aimed at learner profiling, a process of gathering and analysing details of individual learner interactions in online learning activities in order to improve or customise learning for the individual.
Learning Content Management System (LCMS)	An LCMS is a web-based system designed to facilitate the creation and management and access to learning materials for use by teachers and learners.
Makerspace	A makerspace is a physical location where people gather to share resources and knowledge, work on projects, network, and build together.
Learning Content	Training materials used by teachers or learners to facilitate the development of knowledge, skill or attitudinal competence associated with course learning outcomes.
Online Learning	Online learning is a method of delivering educational information via the internet.
Social Media	Internet-based applications that allow the creation and exchange of user-generated content in virtual communities and networks.
Technology-Enhanced Learning	Using technology to facilitate and support innovative teaching and learning practices.
TEL Services	The ICT-based systems used by an institution that may be either internally or externally hosted.
Teacher	In this text, the word 'teacher' is used to refer to all those involved in teaching, training, coaching, tutoring, mentoring or any role that facilitates learning.
Virtual Classroom	A virtual classroom is an online, web-based platform that allows participants to communicate with one another, view presentations or videos/ audio/chat, interact with other participants, and engage with resources in work groups in a real-time synchronous environment.
Virtual Learning Environment (VLE)	Also known as a Learning Management System (LMS) or Course Management System (CMS), this is a web-based platform used for the digital aspects of courses delivery. VLEs typically: allow participants to be organised into groups and roles; and present resources, activities and communication and collaboration interactions within a course structure.

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