ENHANCING LEARNING AND TEACHING THROUGH THE USE OF DIGITAL TECHNOLOGY

A DIGITAL LEARNING AND TEACHING STRATEGY FOR SCOTLAND

Smarter Scotland
Scottish Government

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A MESSAGE FROM THE DEPUTY FIRST MINISTER AND CABINET SECRETARY FOR EDUCATION AND SKILLS

Delivering excellence and equity in Scottish education is my clear focus as Cabinet Secretary for Education and Skills. I am committed to ensuring that we do everything we can to raise levels of attainment, close the poverty related attainment gap and improve the life chances of all our children and young people.

Digital technology can make a significant contribution. Where our educators are supported through professional development, resources and leadership, digital technology can enrich learning and teaching, help to raise levels of attainment and close the attainment gap. The skilful deployment of digital technology in our schools and early learning settings will also ensure our learners develop a level of general and specialist digital skills that are so vital for learning, life and work in an increasingly digitised world. I want to unlock this potential – to the benefit of the individuals, Scottish economy and society as a whole.

The positive impact of digital technology is already felt within schools across Scotland. There are fantastic examples of innovative practice across all areas of Curriculum for Excellence. However, there is more to do to ensure that all our children and young people can benefit in this way.

The strategy sets out a comprehensive approach to deliver the increased effective use of digital technology in education and bring about the equity of opportunity that is the key focus for this government. It is structured around four key areas: the skills of our educators; access to technology; curriculum and assessment; and leadership.

In setting out a clear vision and action plan, this strategy will also clarify expectations around the use of digital technology in education. This forms part of my broader commitment to streamline guidance and minimise bureaucracy for education practitioners in Scotland.

The strategy also aligns with our approach to cyber resilience[1], recognising the importance of ensuring that young people and schools capitalise on the benefits of using digital technology safely.

Of course, the successful delivery of this strategy requires a co-ordinated effort at all levels of the system. This strategy sets out a number of actions at a national level and expectations for local authorities and education establishments, implementation of which will be taken forward in line with the conclusions of the Scottish Government's Education Governance Review.

It is only by working together that we can realise the potential of digital technology for all of our children and young people.

John Swinney
Deputy First Minister and
Cabinet Secretary for Education and Skills

September 2016

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1 Safe, Secure & Prosperous: a Cyber Resilience Strategy for Scotland (November 2015)

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INTRODUCTION

Our Vision

The Scottish Government is committed to improving education in Scotland and delivering the best possible life chances for all of our children and young people. The National Improvement Framework and Scottish Education Delivery Plan demonstrate this commitment. Our overarching vision for Scottish Education is therefore clear:

- **excellence through raising attainment:** ensuring that every child achieves the highest standards in literacy and numeracy, set out within Curriculum for Excellence levels, and the right range of skills, qualifications and achievements to allow them to succeed; and

- **achieving equity:** ensuring that every child has the same opportunity to succeed, with a particular focus on closing the poverty-related attainment gap.

Digital technology can make a substantial contribution to this improvement agenda by enriching education across all areas of Curriculum for Excellence. If used effectively and appropriately, digital technology can **enhance learning and teaching**, equip our children and young people with **vital digital skills** and crucially, it can **lead to improved educational outcomes.**

Digital technology is already embedded within Scottish education. It has a place within Curriculum for Excellence, Initial Teacher Education and the Professional Standards set by the General Teaching Council for Scotland (GTCS). Despite the pervasive nature of digital technology, its benefits are not always fully felt within our education establishments[2]. This strategy aims to improve the current situation by creating the conditions to allow all of Scotland's educators, learners and parents to take full advantage of the opportunities offered by digital technology in order to raise attainment, ambition and opportunities for all.

Aim of the Strategy

In order to realise our vision, partners at both a national and local level must work together to achieve **all** four of the following essential and interrelated objectives that are central to successful digital learning, teaching and assessment[3]:

- **Develop the skills and confidence of educators in the appropriate and effective use of digital technology to support learning and teaching**

- **Improve access to digital technology for all learners**

- **Ensure that digital technology is a central consideration in all areas of curriculum and assessment delivery**

- **Empower leaders of change to drive innovation and investment in digital technology for learning and teaching**

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2 For the purposes of this document, education establishments means early learning and childcare establishments and schools.

3 References to 'learning and teaching' throughout the document should be taken to be inclusive of assessment.

Achieving Our Objectives

This strategy sets out a series of actions to be delivered at a national level under each objective; and these national level actions form the main focus of this document. These actions will shape our approach over the next 3-5 years. However, success cannot materialise at a national level alone and consequently, this strategy also sets out a number of expectations of our local authorities and education establishments.

The Scottish Government is firm in its belief that our local authorities, schools and early learning and childcare establishments are best positioned to know how digital technology can enrich education in their own local contexts. It is for that reason that the local level expectations that are laid out in this strategy are general in nature. They seek to complement actions at a national level while also allowing education establishments and local authorities the flexibility to effectively incorporate digital technology in the way best suited to them.

Taken as a whole, these actions and expectations will form the foundations that will allow digital technology to enhance learning and teaching across all areas of Curriculum for Excellence. We can then build on those foundations to ensure that digital technology is a key consideration in the planning and delivery of all future learning and teaching.

Beneficiaries of the Strategy

As this is an educational strategy, **the ultimate beneficiaries of this strategy will be Scotland's learners aged 3-18**. The appropriate and effective use of digital technology within education will give all of our learners the opportunity to improve their educational outcomes and to develop digital skills that will be vital for life, learning and work in today's increasingly digitised world. The benefits of this strategy also extend to our teachers and early learning and childcare practitioners who will receive training that will allow them to become skilled in the appropriate and effective use of digital technology. Parents and carers will also be able to capitalise on the increased use of digital technology to communicate more readily and easily with their child's school or early learning provider and stay up to date with, and support their child's learning. Both the digital industry and wider economy will similarly benefit as our future workforce will possess a level of digital skills considered essential in occupations across a wide range of sectors.

Approach to Strategy Development

This strategy has been developed using an extensive consultation process from which strategic principles, objectives and actions have emerged. The process comprised a comprehensive public consultation, direct engagement with children and young people and extensive discussions with delivery partners and other prominent stakeholders in the Scottish education sector.

An overview of the strategy development process can be found in Annex D.

The Role of the Scottish Government and National Bodies

To help to achieve our objectives, the Scottish Government and national level delivery partners will work with local partners to[4]:

DEVELOP THE SKILLS OF OUR EDUCATORS

- Ensure Professional Standards for Registration and for Career Long Professional Learning reflect the importance of digital technology and skills.
- Ensure that Initial Teacher Education (ITE) providers instil the benefits of using digital technology to enhance learning and teaching in their students, in line with GTCS Standards for Registration.
- Ensure that a range of formal and informal professional learning opportunities are available to educators at all stages to equip them with the skills and confidence to utilise digital technology appropriately and effectively, in line with GTCS Standards for Career Long Professional Learning.

IMPROVE ACCESS

- Continue national investment into initiatives that support digital access in education establishments.
- Provide guidance at a national and local level around learner access to digital technology.
- Promote approaches to digital infrastructure in education that put users' needs at the heart of the design.
- Encourage and facilitate the development of partnerships that will improve digital access and digital skills development opportunities for our learners.

ENHANCE CURRICULUM AND ASSESSMENT DELIVERY

- Ensure aspects of Curriculum for Excellence relating to the use of digital technology and the development of digital skills are relevant, ambitious and forward looking.
- Support, develop and embed approaches to assessment that make effective use of digital technology.

EMPOWER LEADERS

- Ensure that the vision laid out in this strategy is adequately captured in Professional Standards, self-evaluation guidance and inspections of educational provision in Scotland.
- Support local leaders and decision makers to lead change in their local contexts through accessing and sharing relevant research in order to identify effective approaches to the use of digital technology in education.

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4 Detailed action plans under each objective can be found from p13 onward.

The Role of Local Authorities

To help achieve our shared objectives, **local authorities are asked to develop local strategies** which will take forward the following key actions:

DEVELOP THE SKILLS OF OUR EDUCATORS

- Provide their educators with access to a range of career-long professional learning opportunities that will allow them to make the most effective use of digital technology to enrich learning and teaching and develop the digital skills of their learners.

- Actively share experiences, information and opportunities that will support the professional development of their educators.

IMPROVE ACCESS

- Have an ambitious strategy regarding the use of digital technology in education and actively look for opportunities to continually invest in a sustainable digital infrastructure, including the procurement of appropriate digital devices.

- Ensure that digital technology is a key consideration in all local authority investment programmes pertaining to improvements in the education estate.

- Facilitate dialogue between local authority IT and education departments to ensure that education establishments receive appropriate and effective digital access and that the future needs of learners are proactively and regularly considered.

- Support education establishments in delivering digital access to all learners.

- Actively participate in Education Scotland's 'Digital Leaders Group' and look to share knowledge across local authority boundaries.

- Ensure that all learners and educators within the local authority area can access relevant digital tools and services by assigning them with a Glow login.

ENHANCE CURRICULUM AND ASSESSMENT DELIVERY

- Actively work with SQA to share experiences in order to help develop and improve approaches to digital assessment.

- Support education establishments in delivering the revised technologies area of Curriculum for Excellence, with particular focus on Digital Literacy and Computing Science.

- Support education establishments in identifying how digital technology can be used to enhance learning and teaching across all curriculum areas.

EMPOWER LEADERS

- Develop local strategies that will help educational leaders to ensure that all learners can benefit from an education enhanced by digital technology.

- Provide access to a range of career-long professional learning opportunities for educational leaders, allowing them to make informed decisions about the best use of digital technology to enrich education and promote digital skills development.

- Actively share knowledge and examples of how digital technology can enrich education and facilitate digital skills development across education establishments and local authority boundaries.

The Role of our Education Establishments

To help achieve our shared objectives, our education establishments are asked to take forward the following key actions:

DEVELOP THE SKILLS OF OUR EDUCATORS

- Encourage educators to share innovative and effective practice both face-to-face and through digital platforms.
- Ensure that students and newly qualified staff are sufficiently supported in the appropriate and effective use of digital technology.
- Look for opportunities to use digital technology to engage with parents and carers, allowing them to understand the benefits of digital technology in education.
- Ensure that appropriate career-long professional learning opportunities are offered to a range of educators.
- Ensure learners are involved in sharing their digital experiences and skills and that they are given opportunities to comment on the use of digital technologies to deliver learning and teaching.

IMPROVE ACCESS

- Work with the local authority to obtain appropriate digital hardware and software that can support learning and teaching.
- Ensure all learners including those with additional support needs are able to access appropriate digital technology for learning and teaching.
- Ensure that all learners become resilient users of digital technology and can stay safe online.

ENHANCE CURRICULUM AND ASSESSMENT DELIVERY

- Ensure that the use of digital technology is a central consideration in the planning and delivery of any learning and teaching across Curriculum for Excellence.
- Provide a range of opportunities for learners to develop their digital skills across Curriculum for Excellence.
- Work to identify opportunities to enhance assessment using digital technologies.

EMPOWER LEADERS

- Ensure that the use of digital within their establishment aligns closely with evolving self-assessment and improvement guidance such as 'How Good is Our School?'
- Actively seek to identify existing expertise within the staff complement and ensure that their knowledge is shared with senior leaders.
- Ensure that cyber resilience and internet safety is central to all digital technology use in the establishment.
- Involve parent councils and parent/carer groups in discussions around the use of digital technology to help realise anytime/anywhere learning.

EDUCATIONAL VALUE FROM DIGITAL TECHNOLOGY

1) Enhancing Learning and Teaching

Digital technology can enrich the learning experience for all of our children and young people. We know from consultation activity that our learners already have a strong exposure to digital technology and that they would support its increased use as part of their own education.

Consultations on the views of children and young people on the use of digital technology in education

As part of the development of this strategy, the Scottish Government commissioned Young Scot and the Children's Parliament to gather the views of children and young people on the use of digital technology in education.

The Children's Parliament consulted with 92 children from across Scotland aged between 8-11. The children that took part in the consultation exercise already had strong exposure to digital technology. This included owning a personal digital device and having an informed understanding of the potential dangers associated with having access to digital technology. The children that took part also thought that digital technology makes learning more fun and they would like to see it used more as long it is not over-used. In general, they thought that their access to digital technology in school is constrained by a lack of digital equipment and limitations in the skills of their teachers in using digital equipment.

The full consultation report can be accessed at –
http://www.gov.scot/Resource/0049/00495173.pdf

Young Scot consulted with over 250 children and young people from across Scotland aged between 11-25. The young people consulted thought that digital technology was an important learning aid in the classroom, a good tool for revision, provided an interactive learning experience and gave them a quick way to access information. However, they felt that in general, digital resources within their schools were low, could be unreliable and could be misused, and they felt that in many cases, teachers lacked the knowledge of how to use the digital technology they have.

The full consultation report can be accessed at –
http://www.gov.scot/Resource/0049/00495091.pdf

In tandem with enriching the learning experience, digital technology can also enhance teaching. This potential lies not in the technology itself but in our educators. If used appropriately, digital technology can act as a powerful, flexible and engaging tool for educators that can enhance what they already do so well; teach our children and young people. The table overleaf illustrates that many of the things that are already considered central to excellent learning and teaching can be enhanced by the use of digital technology.

How Does Digital Technology Enhance Learning and Teaching?

Aspect of quality learning and teaching		Opportunities and impact of digital technology
Provision of quality educational content	→	Learners and educators have access to a multitude of additional online educational content as well as being able to create new digital content that can support education.
Tailoring approach to deliver personalised learning	→	A range of digital tools and services (apps, games, websites, etc.) allow educators to offer a number of approaches to learning and learners can choose the approach that best suits them.
Collaborating with others to test understanding of new knowledge and skills	→	Educators can offer learners the opportunity to collaborate online with others from across the world in addition to their peers within their school or early years setting.
Engaging and motivating learners	→	Educators have access to a range of engaging digital tools and services.
Ensuring education is relevant to learners' experience of the world	→	Educators can deliver learning in a digital context using digital tools and services. This better aligns with learners' experience of today's digital world.
Opening up experiences and opportunities for learners	→	Educators can provide learners with access to a range of digital resources which allow 'anytime/anywhere learning' and build a level of digital skills which will be vital in today's digital world.
Providing quality assessment, personalised feedback and data to inform subsequent learning and teaching	→	Educators can reduce workload by using appropriate digital assessments that provide instant results and personalised feedback. This frees time for focusing on next steps and improvement.
Allowing sufficient time for learning and teaching, enabling learners to develop their knowledge and skills	→	Online digital networks allow educators to share resources and digital tools and services expedite lesson planning. Digital assessment eliminates marking time. The time saved can be devoted to quality learning and teaching.
Equity of educational choice	→	Live video streaming and digital tools and services allow the potential for learners to study subjects via online distance learning.

Comhairle nan Eilean Siar – e-Sgoil

Comhairle nan Eilean Siar (The Western Isles Council) has traditionally encountered unique challenges when delivering education. The isolated rural locations of many schools, small school rolls and difficulties in teacher recruitment has made it difficult to offer a wide subject choice to their learners.

In response to these challenges, Comhairle nan Eilean Siar with support from Education Scotland, the Scottish Government and Bòrd na Gàidhlig are developing an e-Sgoil (e-school). This new school will have a hub located in Stornoway which will be linked to all other secondary schools in the Western Isles. This will allow entire classes or individual tuition to be delivered through online distance learning which will utilise live video streaming and a range of digital tools and services available through Glow.

The effect of this new e-Sgoil will be that every secondary school learner in Eilean Siar will be able to access an increased range of subjects in both English and Gaelic. Learners will continue to undertake core subjects in the main school setting however, through the e-Sgoil, they will now be able to access subjects that were previously unavailable to them. Furthermore, this arrangement with also support professional development as educators will be able to access career long professional learning opportunities using the e-Sgoil's infrastructure.

The positive impact of the e-Sgoil may also be felt across Scotland as Comhairle nan Eilean Siar are already in discussions with other local authorities around the potential of opening up the e-Sgoil to learners in other areas.

This project demonstrates how the innovative use of digital technology can offer significant improvement in the delivery of equity of opportunity for both learners and educators in Eilean Siar and beyond.

Use of e-portfolios at St Andrew's RC High School, Fife

St Andrew's RC High School, Fife has utilised Microsoft Office 365 and SharePoint within Glow to develop e-portfolios for all of their learners from S1 to S3. This work has delivered a number of benefits that would not have been so easily realised had digital technology not been used.

The digital solution provides learners with a simple way to store and save their work in a single place. Learners can then review their progress and achievements and, if they so wish, share parts of their e-portfolio with peers and teachers in order to help them identify the next steps to their learning. The e-portfolios are also able to build an accurate and comprehensive record of a learner's progress as examples of work can be easily attached to an appropriate portfolio entry. This can include photos, electronic files and presentations. This accurate record of achievement can then follow a learner as the work can be accessed and added to at any point during a learner's educational journey.

Finally, as the e-portfolios have been accessed on a regular basis, the digital literacy of both learners and teachers has increased and digital technology has become a central part of learning and teaching at the school.

2) Improving Educational Outcomes

It has long been established that excellent teaching leads to excellent educational outcomes for learners. If we can utilise digital technology to enhance learning and teaching in the ways already illustrated, we can also help to improve educational outcomes for all of Scotland's learners. It is vital therefore that Scotland enables its learners to benefit in this way.

Independent Literature Review on the Impact of Digital Technology on Learning and Teaching

In July 2015 the Scottish Government commissioned an independent literature review on the impact of digital technology on learning and teaching. The review specifically looked at the potential for digital technology to support and contribute to five educational priorities:

1. raising attainment;

2. tackling inequalities and promoting inclusion;

3. improving transitions into employment;

4. enhancing parental engagement; and

5. improving the efficiency of the education system.

Nearly 1,000 items of literature were collected from academic, professional and governmental sources. A sift to determine relevance was then carried out and 217 sources of literature formed the basis of the review.

The review concluded that if there is sufficient access to equipment, tools and resources and if there is sufficient training and support for educators, then digital technology can have a positive impact on all five of the educational priorities in question. In particular there was:

• conclusive evidence that digital technologies can support educational attainment in general (and in maths and science subjects particularly);

• indicative evidence that it can support educational attainment in literacy and help close the gap in attainment between groups of learners; and

• promising evidence that digital technologies can provide assistance to 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.

The full literature review can be accessed at –
http://www.gov.scot/Publications/2015/11/7786

3) Building Digital Skills

This strategy is primarily focused on the use of digital technology to enhance learning and teaching across all curriculum areas. However, it is both logical and desirable that an increased and more effective use of digital technology will result in all of Scotland's learners developing a level of digital skills that will be essential in today's increasingly digitised world.

The digital economy is vital to Scotland's economy. Today 82,700 people work in digital jobs in Scotland[5] and the digital sector alone contributes £4.5 billion GVA to Scotland's economy[6]. It is now difficult to imagine a job or industry that doesn't involve some level of digital skills.

> **"Investing in education technology is no longer an option, but a necessity....students unable to navigate through a complex digital landscape will no longer be able to participate fully in economic, social and cultural life around them"**
>
> Andreas Schleicher
> OECD Education Director

To ensure that all of our learners have the best opportunity to develop a wide range of digital skills, this strategy contributes to, and is closely aligned with, work across the public and private sectors to improve the development of general and specialist digital skills. This cross-sector work builds on the 2014 ICT and Digital Technology Skills Investment Plan (SIP); particularly themes 2 to 4 below. Further details of current work on digital skills, which will be a key element of the forthcoming Scottish Government STEM Strategy and aligns strongly with Developing the Young Workforce, can found in Annex E.

Digital Skills Investment Plan Vision

Developing and retaining a talent pool to support the growth of the digital technology professionals across all sectors

OBJECTIVE A **Attract more talent today:** Action to support businesses to meet their immediate skills needs	OBJECTIVE B **Closing the gap:** Action to broaden the talent pool for the sector and better align supply with industry demand		
Theme 1: Responding to the immediate need for ICT and digital technology skills	Theme 2: Broadening the future talent pipeline for ICT and digital technology skills	Theme 3: Working together to make the education system more responsive to the needs of employers	Theme 4: Raising the profile of ICT and digital technology sector and careers

5 Annual Population Survey, Jan 2015–Dec 2015
6 Scottish Annual Business Statistics, 2014

ACHIEVING OUR VISION

Through the experience of delivering a national programme of support, the Scottish Government and Education Scotland identified a number of key objectives that need to be achieved in order to embed the use of digital technology in education. These objectives were further refined through extensive policy research (including the review of international evidence from academic, professional and governmental sources) and tested during a comprehensive public consultation. The objectives below are the result of that development process. These objectives must be achieved if we are to realise our vision and enable all of Scotland's learners to benefit fully from learning and teaching enhanced by digital technology.

- **Develop the skills and confidence of educators in the appropriate and effective use of digital technology to support learning and teaching.**
- **Improve access to digital technology for all learners.**
- **Ensure that digital technology is a central consideration in all areas of curriculum and assessment delivery.**
- **Empower leaders of change to drive innovation and investment in digital technology for learning and teaching.**

Crucially, it is only by achieving **all** four of these objectives that we will create the optimum conditions for the effective and appropriate use of digital technology to enhance and support education.
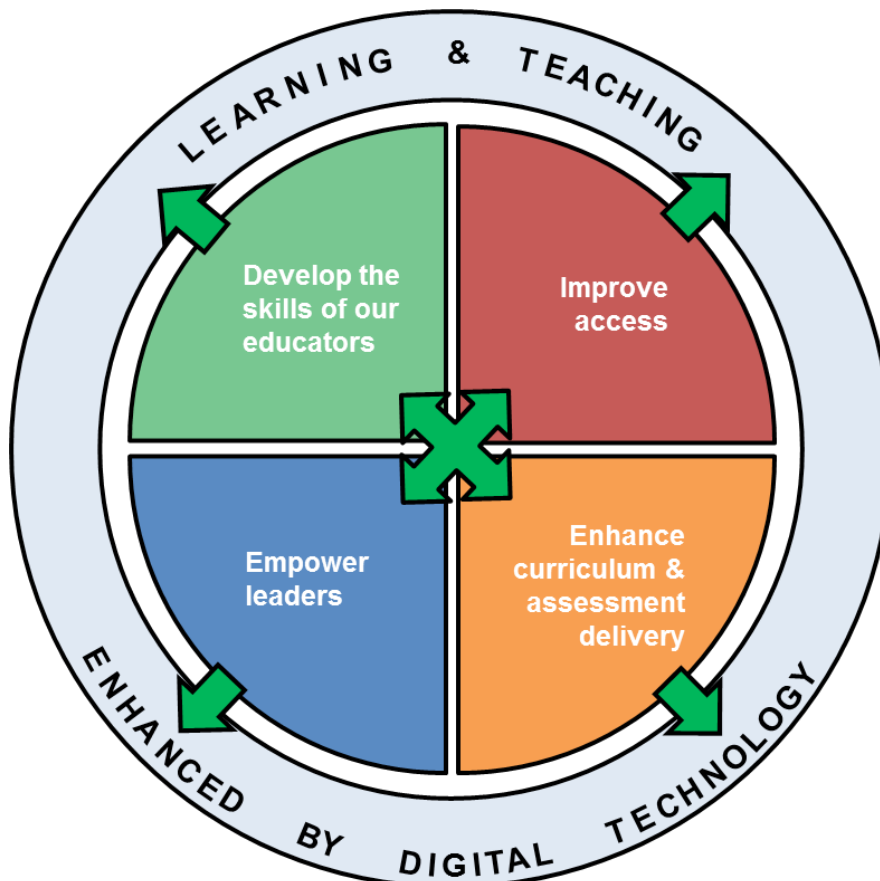
The four strategic objectives will replace the five ICT in education objectives

Since 2011 the Scottish Government has developed its policy around the use of digital technology in education against the five following objectives.

- A change in the culture of digital technologies in education.
- Improved confidence in the use of digital technologies by learners, teachers, school leaders and parents.
- The promotion of new pedagogies.
- Increasing and strengthening parental engagement.
- Provision of the best possible support for hardware and associated ICT infrastructure.

Whilst progressing a national programme of work against the five objectives, it has become evident that if we wish to truly embed the use of digital technology in education, our approach must be more strategic in nature, more action orientated and include contributions from across the education system.

The four new digital learning and teaching objectives encompass the same aims as the previous five objectives but will also deliver the necessary strategic approach.

Achieving the Objectives

To achieve the four strategic objectives will require a transformational change in the way education in Scotland is delivered. Such a change cannot materialise overnight nor by virtue of a small number of actions. The forthcoming chapters therefore set out a range of actions that have been developed with a number of key principles in mind[7]. These actions will act as a catalyst for change at local authority and education establishment level. Taken as whole, all the actions at both national and local level will help to deliver the desired transformational change.

While this change primarily seeks to deliver improved learning and teaching across all areas of Curriculum for Excellence, it will also provide the stimulus, inspiration and environment for all our learners to develop the increasingly sophisticated digital skills which will be vital to them in later learning, life and work.

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7 The key principles that were considered when developing action plans can be found at Annex B.

Objective 1: Develop the skills and confidence of educators in the appropriate and effective use of digital technology to support learning and teaching

It will be our educators and not the digital technology itself that will be the key to delivering improved educational outcomes for our children and young people. Our children and young people will only get the most out of digital technology when it is skilfully deployed to support their learning. It is vital therefore that our educators have the skills, confidence and knowledge to know when and how digital technology can be deployed effectively.

The fact that our educators will be key agents of change is also reflected in Education Scotland's technologies impact report:

> **"It is important to underline that these achievements are based first and foremost not on the digital technology itself, but on key decisions which staff make about the most effective framework and resource for learning. That conclusion affirms the continuing, central role of staff and the importance of their professional and technical expertise."**

The actions outlined in this section will help to ensure that all of Scotland's educators are supported in gaining the necessary skills to deliver learning and teaching supported by digital technology. To ensure that the distinctive needs of early learning and childcare practitioners are met, further engagement with that sector will take place during the implementation of this strategy.

What do we mean by educators?

Any person who has a formal role in educating our children and young people. Early learning and childcare practitioners and teachers are often the primary educators however, this list may extend to support staff, librarians, IT technicians and other practitioners who work within the education sector.

What we will do to deliver

- Ensure Professional Standards for registration and for Career Long Professional Learning reflect the importance of digital technology and skills.
- Ensure that all Initial Teacher Education (ITE) providers instil the benefits of using digital technology to enhance learning and teaching in their students, in line with GTCS Standards for Registration.
- Ensure that a range of formal and informal professional learning opportunities are available to educators at all stages to equip them with the skills and confidence to utilise technology appropriately and effectively, in line with the GTCS Standards for Career Long Professional Learning.

Action Plans

Ensure Professional Standards for Registration and for Career-Long Professional Learning reflect the importance of digital technology and skills	
Action	**Benefit**
The General Teaching Council for Scotland (GTCS) will strengthen references to the use of digital technology and digital skills in the Standards for Registration and the Standards for Career-Long Professional Learning. A review of the standards will commence early in 2017.	Strengthening the prominence of digital technology in GTCS standards will see a change in the delivery of initial teacher education and in the take up of career-long professional learning (CLPL) opportunities related to the use of digital technology. Thus more of our teachers will be using digital technology across all curriculum areas to enrich both learning and teaching.

Ensure that all Initial Teacher Education (ITE) providers instil the benefits of using digital technology to enhance learning and teaching in their students, in line with GTCS Standards for Registration	
Action	**Benefit**
Through their accreditation of ITE Programmes, GTCS will ensure course content adequately reflects revised standards in relation to the use of technology and development of digital skills.	Newly qualified teachers in Scotland will commence their careers with a solid understanding of how to use digital technology for learning and teaching.
The Scottish Teacher Education Committee (STEC) will provide a forum for all ITE institutions in Scotland to discuss digital learning and teaching.	The STEC digital subcommittee will allow ITE institutions to discuss innovative approaches to teaching digital pedagogies and to share innovative practice in this area.

Ensure that a range of professional learning opportunities are available to educators at all stages to equip them with the skills and confidence to utilise technology appropriately and effectively, in line with the GTCS Standards for Career Long Professional Learning	
Action	**Benefit**
GTCS will promote Professional Update as a means through which teachers can develop their knowledge, understanding and skills in the use of digital technology for learning and teaching and thereby facilitate the digital literacy of their learners.	Professional Update is a vital part of career long professional learning for practitioners. GTCS promoting the process as an effective way for practitioners to develop their digital knowledge will help to ensure that more of our educators are skilled in the use of digital technology to enhance education.
In partnership with Education Scotland, the professional associations EIS, SSTA, NASUWT and Voice Scotland will use their communication channels to disseminate information, practice examples and CLPL opportunities related the effective use of digital technology to educators.	It is crucial that information reaches those educators who need it. Utilising the communication channels of professional associations will help to ensure that happens.

Ensure that a range of professional learning opportunities are available to educators at all stages to equip them with the skills and confidence to utilise technology appropriately and effectively, in line with the GTCS Standards for Career Long Professional Learning	
Action	**Benefit**
Education Scotland will launch and promote Barefoot Computing Programme in Scotland.	This programme of online support materials and workshops run by trained volunteers will help primary teachers deliver Computing Science in more engaging and practical ways.
Articles and materials to illustrate practice relating to the use of digital technology will be created and published regularly on Education Scotland's National Improvement Hub.	Educators utilise research, guidance and advice to support their professional development. The new National Improvement Hub will provide a repository for such research which will inform practice and highlight the benefits of using digital technology to support education.
Education Scotland will continue to build a national digital learning community by organising an annual National Digital Learning Week.	For the last two years National Digital Learning Week has promoted the benefits of using digital technology in education. It has provided education establishments and educators with a valuable opportunity to share ideas and approaches relating to the use of digital technology to support education and digital skills development.
Education Scotland, in partnership with key networks including digital leaders from local authorities, will create a range of e-learning modules that will support educators to use the digital tools and services available through Glow. The first suite of modules will be available by the end of 2016.	These modules will build the capacity and confidence of educators in the use of digital platforms (including Glow) to support learning and teaching across all curriculum areas.
Education Scotland will promote the use of platforms that facilitate professional sharing and dialogue, particularly through Glow and the National Improvement Hub.	Educators benefit from the sharing of knowledge and practice to facilitate their professional learning. Glow offers a range of tools and services that allow educators to engage in professional dialogue. Education Scotland is committed to maintaining this opportunity through Glow to allow educators to develop their knowledge around the use of digital technology.

The Role of Glow in Career-Long Professional Learning

The Scottish Government and Education Scotland allow all educators to access a variety of digital tools and services through Glow. These digital tools and services are available at no cost to educators and can be used to share information and opportunities and support career long professional learning. For example:

- **Yammer** is an online discussion and collaboration tool that allows educators to make connections and share resources in a secure social network. Users can connect with a range of others to share knowledge and advice as well as joining or creating groups for people that share a common interest.

- **Glow TV** can provide national interactive broadcasts allowing professional dialogue between the host and the participants. These sessions can be recorded and are made available in the Watch Again blog to allow educators to view these again at any time.

- **Glow Meet** is an online meeting tool to allow educators to easily engage in professional dialogue, share documents and deliver presentations.

- **Glow Blogs** can be used by schools and local authorities to share information and facilitate professional working and interaction.

In addition to digital tools and services, Glow also allows educators to access a range of **professional learning communities**. These nationally available online spaces allow educators to share resources, work collaboratively and take part in online discussions across a range of curriculum areas and educational topics.

National Numeracy and Mathematics Hub

In August 2015 the National Numeracy and Mathematics Hub was launched in Glow. This is a virtual learning environment for all practitioners which provides an innovative approach to career-long professional learning. During the 2015-16 session there were 45 broadcasts covering a range of content and approaches to learning and teaching in numeracy and mathematics across the 3-18 curriculum. This included advice and guidance regarding mental agility, the senior phase, developing number knowledge, financial education and outdoor learning. There were also broadcasts on planning for effective learning and teaching including a look at teaching approaches from around the world.

Education Scotland promote these broadcasts via Hub Champions at local authority level. Last session more than 8,000 teachers logged on and participated in these broadcasts.

Objective 2: Improve access to digital technology for all learners

Although access to digital technology will not by itself lead to an improvement in educational outcomes, it is central to that aim. Our consultation process combined with national evidence has provided a picture showing us that the digital infrastructure in Scotland's education establishments remains inconsistent. The impact of this inconsistency is that educators often lose confidence that the available digital technology will work, and as such they choose not to incorporate it into their teaching. If all of Scotland's learners are to benefit from an education enhanced by digital technology, action must be taken not only to bring the digital infrastructure of education establishments up to standard but also to continually review and improve that provision to achieve sustainability. The actions outlined below aim to help all of Scotland's schools, early learning and childcare establishments and local authorities improve the provision of digital technology for the ultimate benefit of their learners.

What we will do to deliver

- Continue national investment into initiatives that support digital access in education establishments.
- Provide guidance at a national and local level around learner access to digital technology.
- Promote approaches to digital infrastructure in education that put users' needs at the heart of the design.
- Encourage and facilitate the development of partnerships that will improve digital access and digital skills development opportunities for our learners.

The Importance of Cyber Resilience

We want to ensure that all of our learners are not restricted in accessing appropriate online content that can support and enrich their education. However, we also want our learners to be able to remain safe online. To achieve this goal, the Scottish Government and Education Scotland will work with education establishments and local authorities to ensure that learners and educators are fully aware of the importance of being digitally resilient. This means not only having the technical measures in place for online security, but also teaching learners and educators to be prepared for online threats and ensuring that they can respond and recover if they are encountered.

This work will be guided by and closely aligned with the Cyber Resilience Strategy for Scotland.

Improving Digital Infrastructure in Schools – Edinburgh City Council

In 2015, Edinburgh City Council signed a new contract for provision of ICT services across the authority. One of the key improvements brought about by this new arrangement is that bandwidth is set to increase by up to 50x in primary schools and up to 100x in secondary schools. This will help to ensure that learners and teachers across the city are not restricted by bandwidth and are able to access online tools and services that support their education as and when required.

Full details of the new contract can be found here – http://www.edinburgh.gov.uk/news/article/1890/council_set_to_save_50m_through_new_ict_contract

Anytime, Anywhere Learning in Falkirk

In 2011 Falkirk Council launched a new local ICT strategy entitled 'Anytime, Anywhere Learning'. This strategy aimed to ensure that learners and educators could access the benefits of digital technology throughout all stages of learning and teaching.

During strategic development, Falkirk Council recognised that achieving appropriate connectivity and 1:2:1 device provision would be out with available budgets. Instead, Falkirk Council set about providing wireless internet access across all of its school establishments. This meant that all learners and educators could connect their own personal digital devices to the Wi-Fi for use during learning and teaching, in addition to school provided devices.

To help ensure a smooth transition to this arrangement, Falkirk Council developed a new acceptable use policy in partnership with learners, parents, teachers and Unions and set up a support blog containing hints, tips and FAQs.

This new Bring Your Own Device (BYOD) arrangement has successfully delivered anytime, anywhere learning as both learners and educators can access curriculum content across mobile and desktop devices both in and out of school. This benefit has been keenly felt at St Mungo's High School in Falkirk where OneNote within Glow is utilised as the main storage platform for lesson content. This innovative work has resulted in the school being awarded 'Showcase School' status by Microsoft for 2016/17; the only school in Scotland to achieve this status.

Action Plans

Continued national investment into initiatives that support digital access in educational establishments	
Action	**Benefit**
The Scottish Government will continue to offer to fund broadband for education to a central point in all local authorities through the Scottish Wide Area Network (SWAN).	The internet is an essential educational resource. Continuing this initiative will help to ensure that all of Scotland's learners have access to important online educational resources.
The Scottish Government will continue to offer a suite of national procurement frameworks that allow public sector education establishments and local authorities to buy digital devices.	The provision of digital access can be an expensive undertaking. Continuing this initiative will help to ensure that local authorities and education establishments can achieve easy market access and best value for money.
Education Scotland will promote the opportunities for early learning and childcare (ELC) providers to gain access to Glow either through their local authority or through Education Scotland.	If our learners are able to access the benefits of appropriate digital tools and services from early years onwards, we can enrich their education from an earlier age.
The Scottish Government and Education Scotland will continue to fund and develop Glow and provide access to all learners and educators in Scotland at no cost to them.	Glow allows all learners and educators to access a range of up-to-date and relevant digital tools and services that can enrich education across all areas of Curriculum for Excellence.
Education Scotland will continue to support educational establishments in how digital technology (and Glow in particular) can best be used to enhance learning and teaching across all areas of Curriculum for Excellence.	This support service helps education establishments understand how they can use digital technology appropriately and effectively.
Education Scotland will work with partners including GTCS and SCEL to increase the range of education services that can be accessed through a common 'single sign-on' authentication mechanism. The first set of services will be available through Glow by the end of 2016 and work to add other services will continue throughout 2017.	Having different login details for a variety of different education services can be a barrier to their use. Greater use of a common single sign-on mechanism would simplify access, increase utility and reduce bureaucracy.

Provide guidance at a national and local level around learner access to digital technology

Action	Benefit
The Local Government Digital Transformation Board will formally recognise that early years and childcare settings, schools, learners and educators have a distinct set of needs when it comes to digital access and require a tailored approach.	Our consultation activity indicated that education establishments are often constrained by corporate IT networks. These networks inadvertently block access to a range of valuable online resources. An agreed approach that allows access to a wide range of useful material while still protecting learner safety would help to improve digital access for all our learners.
The Local Government Digital Transformation Board will provide guidance to local authority IT departments relating to digital access and digital infrastructure for education.	It is essential that all local authority IT departments have access to a clear specification for the future requirements for the digital access of education establishments. This will allow them to work towards building an appropriate infrastructure within funding and geographical constraints. Guidance produced by the Digital Transformation Board will help to ensure a consistent understanding across Scotland.

Promote approaches to digital infrastructure that put users' needs at the heart of the design

Action	Benefit
Education Scotland will convene a 'Digital Leaders Group' comprising representation from all of Scotland's 32 local authorities. The first meeting of the Digital Leaders Group will take place early in 2017.	It is essential that strategies, plans and practice relating to the provision and use of digital technology in education is shared across local authority boundaries. This group will include a representative from each local authority and will provide a valuable forum for the sharing of practice and experiences.
Scottish Government and Scottish Futures Trust will bring more robust scrutiny to the principles that relate to digital technology which are outlined in the Scottish Government's School Estate Strategy.	This action will help to ensure that digital infrastructure will be a key design consideration for all new schools being built as part of the School's for the Future Programme.
Skills Development Scotland in partnership with Education Scotland will conduct and disseminate research that will identify and test innovative approaches to high level digital skills development in secondary schools with a view to developing a national framework.	This will help schools and local authorities to understand how they can best deliver digital learning and teaching and digital skills education, including any improvements that need to be made to digital infrastructure.

Encourage and facilitate the development of partnerships that will improve digital access and digital skills development opportunities for our learners	
Action	**Benefit**
Education Scotland will work with industry partners to deliver the Digital Schools Award Scotland Programme. This will give all primary schools in Scotland the chance to work towards an accredited digital school award.	This programme will aim to promote, recognise and encourage excellence in the use of digital technology across primary schools in Scotland. It provides access to a step by step framework detailing how schools can make the best use of digital technology in their local context.
Education Scotland will encourage and facilitate opportunities for schools to build partnerships with employers as part of the Developing Young Workforce programme.	The Developing Young Workforce Programme aims to ensure education and employers work in collaboration to enrich learning across the curriculum. This can include employers facilitating the use of digital technology to improve young people's understanding and readiness for employment.

Objective 3: Ensure that digital technology is a central consideration in all areas of curriculum and assessment delivery

Curriculum Delivery

The importance of our learners being able to use a variety of digital technologies and possessing a range of digital skills in today's increasingly digitised world is clear. Yet our consultation exercise has indicated that our learners tend to have limited opportunities to use digital technologies and develop the associated digital skills during their education. This is because digital technology is still seen as the preserve of specialist teachers and is therefore not being fully utilised to deliver experiences and outcomes across Curriculum for Excellence.

It is only when digital technology finds a place in all curriculum areas that our learners will be able to fully benefit from an education enhanced by digital technology.
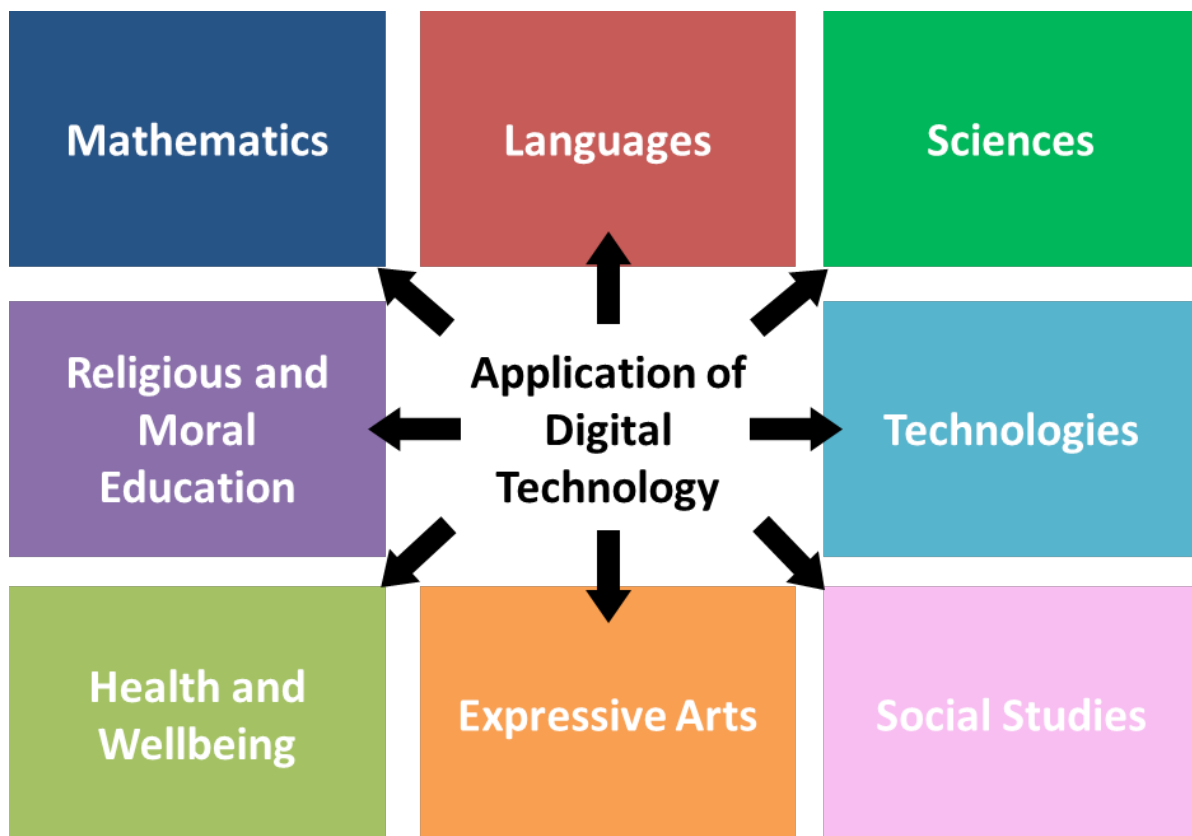
The Prominence of Digital Technology in the Curriculum

There is now a wide consensus that digital technology should receive a more prominent role in curriculum delivery.

"It is important that young people have the opportunity to develop technology and industry awareness across all parts of the curriculum"
ICT and Digital Technologies Skills Investment Plan (2014) Skills Development Scotland

"Digital skills should be embedded in the curriculum and developing a digital literacy for all has to be integral throughout Curriculum for Excellence"
Digital Solutions to the Productivity Puzzle (2016) Scottish Council for Development and Industry

"Students who were only exposed to digital education in designated ICT classes suffered a distinct disadvantage when compared to those whose schools chose to mainstream technology and digital skills across the curriculum"
Digital Skills Crisis (2016) House of Commons Science and Technology Committee

Assessment Delivery

Assessment is an integral part of learning and teaching and digital technology has significant potential to improve the assessment process. If utilised appropriately it can help to reduce teacher workload and ensure a more efficient assessment process both in terms of the assessment time itself and the time required to provide results and feedback. Digital assessment platforms can also easily provide personalised feedback to learners, this feedback can then be utilised by educators to ensure that learners focus on areas in most need of improvement. The time saved can instead be used to enrich learning and teaching.

The Benefits of e-Assessment at Armadale Academy, West Lothian

In 2014 Rosie Steele, a maths teacher at Armadale Academy started using the SQA's online assessment platform to deliver summative unit assessments for her pupils studying Lifeskills Mathematics at National 4 and National 5.

Using online assessments allowed Rosie to save time in relation to preparing for and marking assessments, moderating assessments and providing targeted feedback to learners. **As a result of using e-assessment Rosie calculated she had saved 46.5 hours of time per year.**

In addition to achieving time efficiencies, Rosie also received positive feedback from her pupils. They enjoyed the way that the use of digital technology was consistently present in their day to day learning through to their final assessment. Furthermore the use of digital technology for assessment purposes resonated with their everyday experience of living and learning in a digital world.

Full details of Rosie's story can be found at http://www.sqa.org.uk/sqa/73283.html

What we will do to deliver

- Ensure aspects of Curriculum for Excellence relating to the use of digital technology and development of digital skills are relevant, ambitious and forward looking.

- Support, develop and embed approaches to assessment that make effective use of digital technology.

Action Plans

Ensure aspects of Curriculum for Excellence relating to the use of digital technology and development of digital skills are relevant, ambitious and forward looking	
Action	**Benefit**
In partnership with key stakeholders, Education Scotland will lead a refresh of the technologies area of Curriculum for Excellence which includes the cross curricular experiences and outcomes relating to ICT to enhance learning and digital skills development.	It is vital that the Experiences and Outcomes which underpin learning from 3-18 reflect the importance of digital literacy and more specialist digital skills. This update – the first refresh of the Scottish curriculum since the introduction of Curriculum for Excellence – will support educators in providing an education enriched by digital technology.
Education Scotland will support educators in the delivery of the refreshed technologies experiences and outcomes and bench marks to be produced later this year.	This action will help to ensure that all of our educators are supported to deliver a refreshed Curriculum for Excellence.

Support, develop and embed approaches to assessment that make effective use of digital technology	
Action	**Benefit**
The Scottish Qualifications Authority (SQA) will re-design existing and build new digital services that will provide support and information to meet the identified needs of its different customer groups. As part of this re-design the SQA will continue to develop and grow the use of formative and summative on line assessments to support qualifications.	SQA's commitment to develop new digital services and redesign existing ones will ensure that all customers always have ready access to up-to-date information on qualifications and assessments through services that are designed around their needs. This includes information on digital assessment services. By building on the significant work already undertaken in this area, SQA will help to ensure that all learners and educators can benefit from the use of digital technology to support assessment.

Support, develop and embed approaches to assessment that make effective use of digital technology	
SQA will, over time, develop the capabilities needed to manage assessment evidence in a digital format for all of its qualifications.	Learners are developing increasing volumes of their evidence in digital formats. SQA's commitment to develop their capabilities to accept evidence in a digital format will mean more of our learners can choose to utilise digital technology and its associated benefits to create work that will contribute to their final qualifications.
SQA will champion the use of digital approaches to assessment in education by establishing mechanisms for engaging with representatives from local authorities to ensure that innovative practice is shared and digital approaches to assessment are fit for purpose and meet the needs of both the learners and education establishments.	As digital technology continues to develop, the ways in which it can support assessment will also change. Effective engagement between SQA and local authorities will ensure that the place of digital technology in assessment is continuously strengthened and that new approaches are developed in a way that ensures their validity and fitness for purpose.

Objective 4: Empower leaders of change to drive innovation and investment in digital technology for learning and teaching

If digital technology is to be used consistently to enhance learning and teaching across Scotland, then it is essential that leaders at all levels understand the benefits of digital technology in education and support its increased use. It is only with this knowledge and support that leaders will be able to make informed decisions about how digital technology can best support education in their local contexts. The increased use of digital technology in our education establishments will require careful planning and local leaders must be central to that planning process. Our consultation activity tells us that at present, Scotland's leaders and decision makers at all levels need better access to appropriate advice to guide investment, innovation and implementation in education technology. The actions outlined below will look to address this issue.

What do we mean by leaders?

Any person who has the power to make decisions that will effect sustainable change no matter how big or small. This may include but not be limited to head teachers, ELC managers, classroom teachers, ECL practitioners, ICT managers, information security officers, quality improvement officers, local authority policy officials and even those who work in the digital sector.

What we will do to deliver

- Ensure that the vision laid out in this strategy is adequately captured in Professional Standards, self-evaluation guidance and inspections of educational provision in Scotland.

- Support local leaders and decision makers to lead change in their local contexts through accessing and sharing relevant research in order to identify effective approaches to the use of digital technology in education.

Action Plans

Ensure that the vision laid out in this strategy is adequately captured in Professional Standards, self-evaluation guidance and inspections of educational provision in Scotland	
Action	**Benefit**
GTCS will strengthen digital references in the Professional Standards, encouraging appropriate use of technology and the development of teachers' and learners' digital skills. A review of the standards will commence early in 2017.	Strengthening the prominence of digital technology in GTCS standards will see more of our teachers using digital technology to enrich both learning and teaching.
Education Scotland will continue to ensure that self-evaluation guidance references the importance of using digital technology to enhance learning and teaching and develop digital skills for life, learning and work.	Inspections of educational provision and self-evaluation guidance such as 'How Good is our School?' and 'How Good is our Early Learning and Childcare?' are central to the process of educational improvement. If the use of digital technology and importance of digital skills development continues to be prominent in both inspections and self-assessment guidance, our educational establishments are more likely to appreciate the benefits of digital technology in education and support its use.
Education Scotland will ensure that inspections include a focus on effective and innovative use of digital technology.	
Education Scotland will provide further development opportunities to ensure that inspectors have a sound understanding of effective and innovative use of digital technology in education.	

Support leaders and decision makers to lead change in their local contexts through accessing and sharing relevant research in order to identify effective approaches to the use of digital technology in education	
Action	Benefit
Association of Directors of Education in Scotland (ADES) will provide a forum for discussion and action-planning around this strategy for education authority leads; primarily through its Curriculum, Assessment and Qualifications Network; and its Resources Network.	This forum will allow educational leaders to collaborate, share and plan effective approaches to the use of digital technology. All of which will guide investment and innovation in their local contexts.
School Leaders Scotland (SLS) will run CLPL events that focus on how digital technology can effectively support learning and teaching.	The majority of local educational leaders are not experts in digital technology and as such require the opportunities to develop their knowledge in this area. The events offered by SLS will help local leaders in a secondary school setting to develop this knowledge.
The General Teaching Council for Scotland (GTCS), the Association of Directors of Education in Scotland (ADES), School Leaders Scotland (SLS), the Association of Heads and Deputes in Scotland (AHDS), the Scottish Qualifications Authority (SQA) and the National Digital Learning Forum (NDLF) will share practice examples of how digital technology can be used to enhance education and aid the development of digital skills.	Digital technology develops at a rapid pace, both in terms of the technology itself and how it can be used to support learning and teaching. Use of wider communication channels through our key partners will ensure that educational leaders at a local level have access to relevant research and guidance from a range of sources. This will help to ensure that they can make well informed decisions and continue to effectively review the use of digital technology to support education in their local contexts.
The Scottish College of Educational Leadership (SCEL) will actively seek to endorse leadership programmes or other CLPL opportunities that relate to the use of digital technology in education.	This process will provide coherence and quality assurance around professional learning opportunities and will aim to deliver articulation between the SCEL Framework for Educational Leadership, the GTCS Standards and other areas of national focus.
Education Scotland will ensure that guidance relating to the use of digital technology in education is prominent and freely available in the new National Improvement Hub.	This will ensure that educational leaders can easily access relevant research and guidance through an open, accessible and relevant repository.

IMPLEMENTATION OF ACTION PLANS

National Level Actions

The national level actions which are outlined in action plans under each objective, will be taken forward by the named delivery partner. In recognition of the number of actions outlined in the strategy and their close relationship to one another, overall implementation of the action plans and progress towards the four objectives will be monitored by the Digital Learning and Teaching Programme. This is a programme jointly led by Education Scotland and Scottish Government. It has been established since 2012 and in that time has worked closely with all delivery partners outlined in this document. As such the Programme is in a strong position to monitor progress towards the four key objectives.

Local Level Actions

Local authorities and individual education establishments are best positioned to know how digital technology can enrich education in their own local contexts. It will therefore be for local authorities and education establishments to decide how best to take forward the expectations outlined in this document. In taking forward these expectations, the Scottish Government and Education Scotland will continue to provide advice and support as and when needed.

MEASURING SUCCESS

To redefine the role that digital technology plays in Scottish education is to achieve a cultural change. There is no one single indicator that will tell us if we have achieved that goal. The Scottish Government and Education Scotland will therefore work with delivery partners at a national level, local authorities, schools and early learning and childcare establishments to agree on appropriate indicators of success and a process for reviewing those indicators going forward.

The following indicators are likely to be of the kind that will help build a picture of success.

Indicator	How it will help measure success
Glow usage	Glow provides access to a range of digital tools and services that can enrich learning and teaching. An increase in the usage of Glow will indicate that more learners and educators are incorporating digital technology into education.
Qualitative data from school inspection reports	When undertaking inspections, HM Inspectorate at Education Scotland look for the effective and appropriate use of digital technology. If inspection reports show an increase in the effective and appropriate use of digital technology then it will indicate that this strategy is having an impact.
Number of schools in Scotland undertaking and completing appropriate digital awards	Awards and programmes such as Digital Schools Award Scotland and Microsoft's Showcase School status indicate that education establishments are embedding the use of digital technology within their learning and teaching.
Statistical publications	Statistical publications such as the OECD's ICT familiarity questionnaire (which forms part of PISA) and the Behaviour in Scottish Schools Research can provide us with a picture of the uptake and impact of digital technology on education. Education Scotland and the Scottish Government will commit to ensuring that such statistical analysis contains a digital technology focus where appropriate.

ANNEXES

Annex A – Glossary of Digital Terms

Digital technology is the term used to describe those digital applications, services and resources which are used to find, analyse, create, communicate, and use information in a digital context.

Digital learning is learning which is supported and enhanced by a range of digital technologies and approaches. It can focus on one or more particular technologies. It may focus on classroom use or anywhere-anytime access. It may include features and approaches that are used to develop independent learners.

Digital literacy encompasses the capabilities required for living, learning and working in a digital society. It includes the skills, knowledge, capabilities and attributes around the use of digital technology which enable individuals to develop to their full potential in relation to learning, life and work. It encompasses the skills to use technology to engage in learning through managing information, communicating and collaborating, problem-solving and being creative, and the appropriate and responsible use of technology.

Digital skills embrace a spectrum of skills in the use and creation of digital material, from basic digital literacy, through problem solving and computational thinking to the application of more specialist computing science knowledge and skills.

Digital teaching means educators providing and supporting enhanced learning opportunities through use of digital technologies.

Digital tools and services are the online tools and services such as apps, websites and games that can be used by educators to enhance learning and teaching in all curriculum areas. An example of digital tools and services are those that can be accessed by educators and learners in Glow.

Digital infrastructure refers to the infrastructure that supports the use of the internet, digital content, digital hardware and digital software and allows them all to work together.

Digital access refers to the ability of learners and educators to access digital hardware, software, tools, services and/or the internet for the purpose of enhancing and supporting education.

Digital assessment/e-assessment refers to the use of digital technology to conduct the whole or part of a learner's formative and/or summative assessment.

Annex B – Strategic Principles

The following principles were identified as fundamental to effective learning and teaching supported by digital technology. They were considered when developing this strategy and should be considered when developing future national and local approaches to the use of digital technology in learning and teaching.

The best interest of learners – All decisions relating to the provision and incorporation of digital technology in learning and teaching must be in the best interest of learners.

Local leadership and national support – Approaches to learning and teaching enhanced by digital technology work best when adapted to local contexts. It should be for local leaders to make decisions concerning the use of digital technology to support education. The Scottish Government and Education Scotland will support these local decisions by providing advice and guidance.

Partnership working and sharing practice – In order for digital technology to successfully enhance learning and teaching, partnership working, the sharing of responsibility and the sharing of practice is essential. Our learners will only be able to benefit fully from digital technology in education once this collaborative approach is embedded.

Inclusion and opportunities for all learners – The unique flexibility offered by digital technology allows educators to tailor their approaches to best suit individual learners. When learners have the opportunity to learn in a way that best suits them, they have the best opportunity to improve their educational outcomes.

Integration – Any successful approach to enhancing learning and teaching through the use of digital technology must be integrated and aligned with relevant policies and initiatives in both the education and digital sectors.

Sustainability and affordability – The prominence of digital technology in society has grown rapidly in recent years and this trend shows no sign of slowing down. To ensure that our children and young people can benefit fully for generations to come, it is imperative that any developments are both sustainable and affordable.

Evolution – Digital technology is constantly changing both in terms of the technology itself and the pedagogies used to deliver learning and teaching enhanced by digital technology. To ensure our children and young people benefit fully, our approaches will need to be continuously reviewed and improved.

Annex C – The Broader Policy Landscape

How does the strategy fit into Scotland's broader policy landscape?

The vision for digital technology to support learning and teaching builds on a number of key National Outcomes in the Scottish Government's National Performance Framework:

- Our children have the best start in life and are ready to succeed.
- Our young people are successful learners, confident individuals, effective contributors and responsible citizens.
- We are better educated, more skilled and more successful, renowned for our research and innovation.
- We have tackled significant inequalities in Scottish society.
- We live in well-designed, sustainable places where we are able to access the services we need.
- We realise our full economic potential with more and better employment opportunities for our people.

http://www.gov.scot/About/Performance/scotPerforms/outcomes

This strategy also supports and complements wider work by the Scottish Government and its partners.

The National Improvement Framework –There will be significant opportunity for digital technology to contribute to the educational improvement agenda brought forward by the National Improvement Framework.

http://www.gov.scot/Topics/Education/Schools/NationalImprovementFramework

The Scottish Attainment Challenge – The independent literature review has shown that digital technology has the potential promote inclusion and close the attainment gap.

http://www.gov.scot/Topics/Education/Schools/Raisingeducationalattainment

The National Improvement Hub – The newly developed hub will include resources that can support practitioners in the use of digital technology to support learning and teaching.
https://education.gov.scot/improvement

Developing the Young Workforce – This strategy will help to equip learners with the digital skills they require for employment.

http://www.educationscotland.gov.uk/learningandteaching/thecurriculum/dyw

'How Good is Our…..?' – This series of guidance produced by Education Scotland includes 'How Good is Our School?' and 'How Good is Our Early Learning and Childcare?' The use of digital technology in education can help education establishments to meet all of the quality indicators outlined in these documents.

Education Scotland's Building Society Report – This strategy will support the conclusions and actions from the 'Technologies Impact Review' which look to put digital technology at the heart of learning.

http://www.educationscotland.gov.uk/Images/TechnologiesImpactReport__tcm4-850866.pdf

Scotland's Digital Future – This strategy builds on the Scottish Government's 2011 digital strategy, which focused on four key areas in terms of Connectivity, Digital Economy, Participation and Data Management. In particular, it shares its aspiration to ensure that Scotland can take full advantage of the opportunities offered by the digital age, ensuring a fairer and more prosperous digital Scotland. http://www.gov.scot/Publications/2011/03/04162416/0 . A refreshed Digital Strategy will be published later this year.

ICT & Digital Skills Investment Plan (SIP) – This strategy aligns closely with the 2014 Skills Investment Plan, particularly on actions identified under its second, third and fourth themes.
https://www.skillsdevelopmentscotland.co.uk/media/35682/ict__digital_technologies_sector_skills_investment_plan.pdf
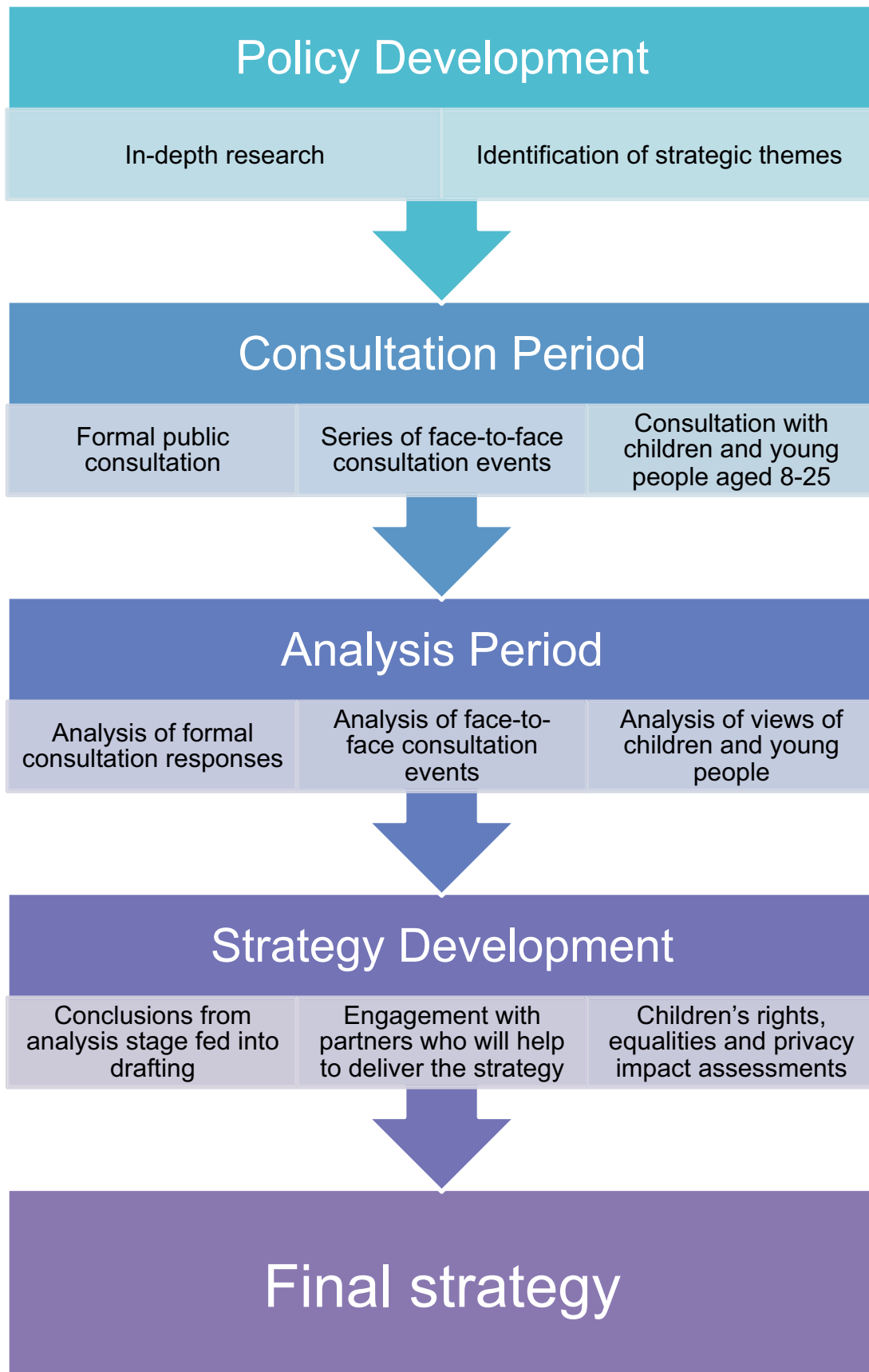
Gaelic Medium Education – This strategy offers the opportunity for Gaelic medium education (GME) to offered more widely across Scotland. At present, demand for Gaelic medium educators outweighs supply. Digital technology offers a solution to this problem as a relatively small number of educators can deliver the Gaelic curriculum to an increased number of learners through online distance learning.

STEM Strategy – The Scottish Government is developing a Strategy which will ensure young people can access STEM qualifications, knowledge and training linked to key skills gaps in the economy, and are alive to the opportunities that STEM offers them. The importance of digital skills will be incorporated in this Strategy.

Safe, Secure and Prosperous: a Cyber Resilience Strategy for Scotland – This five-year strategy features education, professional development and skills as key priorities. It seeks to embed cyber resilient knowledge and behaviours across all curricula, and to ensure that educational institutions, as with other public sector organisations, are resilient against inevitable attacks from cyberspace.
http://www.gov.scot/Publications/2015/11/2023

Annex D – Strategy Development Process

Policy Development

| In-depth research | Identification of strategic themes |

Consultation Period

| Formal public consultation | Series of face-to-face consultation events | Consultation with children and young people aged 8-25 |

Analysis Period

| Analysis of formal consultation responses | Analysis of face-to-face consultation events | Analysis of views of children and young people |

Strategy Development

| Conclusions from analysis stage fed into drafting | Engagement with partners who will help to deliver the strategy | Children's rights, equalities and privacy impact assessments |

Final strategy

Annex E – The Digital Skills Agenda

Introduction

Young people need to develop digital skills in order to thrive in modern society and the workplace. The digital technology sector and wider economy can offer exciting and well-rewarded careers to those with the right high level skills and attributes. Through our work on digital skills we can forge strong links between the two, to the benefit of our young people and economy alike.

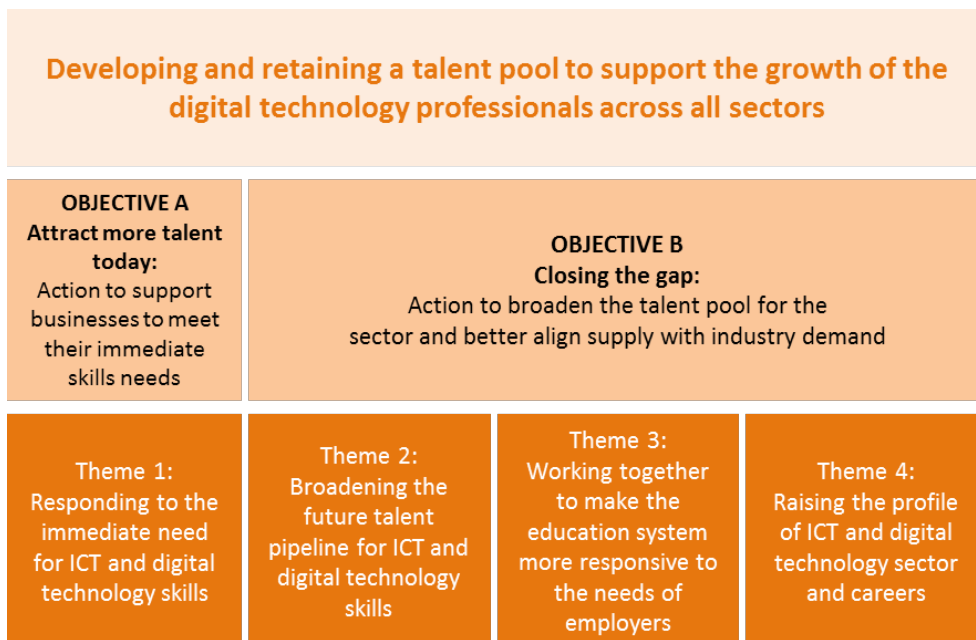## The Digital Learner Journey – Vision

We want to ensure that from the earliest stages of their education, children can begin to develop digital literacy, finding stimulation in early years settings and schools which use digital technology to enrich learning across the curriculum. As they advance through education, they should develop increasingly sophisticated technical skills, becoming confident in the creation as well as use of digital materials. Across a range of different subjects, they will develop computational thinking, taking a logical and creative approach to problem solving. They will learn more about different jobs, the use they can make of their digital skills in a wide range of careers and the pathways that they can take to reach them. They can develop their technical expertise both in the classroom and through out-of-school clubs. Both girls and boys will value their digital skills and the opportunities they offer. Links between schools, colleges, universities and industry will ensure that their learning is enriched by a range of professionals. This will help them take the next step – whether that's into further/higher education, apprenticeship or a job – and continue to build a future where their learning, life and work are all enhanced by their digital skills.

Digital Skills Investment Plan

Since the 2014 launch of the ICT/Digital Technologies Skills Investment Plan (SIP), a strong public/private sector partnership, supported by £8.5 million Scottish Government funding, has driven forward a range of initiatives to ensure that:

- employers have the short and long-term pipeline of digital talent which they require; and

- individuals are equipped to access the many high-quality jobs which the Digital Technologies sector and wider economy can offer.

The SIP is structured around a number of objectives and themes:

Developing and retaining a talent pool to support the growth of the digital technology professionals across all sectors

OBJECTIVE A **Attract more talent today:** Action to support businesses to meet their immediate skills needs	**OBJECTIVE B** **Closing the gap:** Action to broaden the talent pool for the sector and better align supply with industry demand		
Theme 1: Responding to the immediate need for ICT and digital technology skills	Theme 2: Broadening the future talent pipeline for ICT and digital technology skills	Theme 3: Working together to make the education system more responsive to the needs of employers	Theme 4: Raising the profile of ICT and digital technology sector and careers

A key feature of the Digital Technologies SIP is that it provides a framework and action plan for public bodies, industry and education to invest in and take forward projects jointly.

Initiatives like CodeClan, Scotland's first accredited digital skills academy providing an intensive retraining programme, demonstrate that innovative approaches can be achieved through private and public sector working to jointly develop solutions. This has helped to address the sector's immediate needs.

Current Developments

Attention is now particularly focused on broadening the talent pipeline over time, ensuring that our education system both responds to and capitalises on the future high quality job opportunities available to young people.

This aligns closely with our work on a forthcoming Scottish Government STEM strategy which will raise the levels of STEM enthusiasm, skills and knowledge in order to support attainment in learning, life and to meet labour market needs. Digital will be a key element of that strategy. Likewise, we are acting to ensure we build on the clear synergies between the work on digital skills and wider activity on Developing the Young Workforce. The Digital Technologies sector can offer valuable opportunities to test and improve industry/education links more generally.

Actions being taken both through and beyond the Skills Investment Plan include:

- A refresh of relevant elements of the **curriculum**, resulting in updated expectations and an increased focus on digital skills development.

- **Digital Schools** – a new programme bringing together industry and education representatives to test innovative approaches to high level digital skills development in secondary schools, using regional pathfinders with a view to developing a national framework and transforming practice.

- **Digital World** – an industry-led marketing campaign raising awareness of the varied and attractive careers available to those with requisite digital skills and qualifications.

- **Digital Xtra** – a co-ordinated approach to funding for extra-curricular activities such as coding clubs, in particular encouraging girls and other under-represented groups to develop these key skills.

- A range of support to **build teacher confidence and capacity**. For example, Education Scotland digital development officers offering support in the use of technology and development of digital skills in primary schools across Scotland; with new materials and free workshops available through the Barefoot Computing programme; and a new Digital Schools Award available in primary schools.

- Using the Digital Schools framework and other means to explore and respond to **professional development** needs at secondary level.

- Work to boost the number of Computing Science **teachers**, encouraging more to enter the profession with our 'Inspiring Teachers' campaign, increased student intake targets and efforts to develop innovative routes into the profession.

- Ongoing work to expand and refresh the suite of **qualifications** available to develop and accredit learners' digital skills (e.g. new National Progression Award in Cyber Security).

- Developing new vocational **digital pathways** such as digital Foundation and Graduate Apprenticeships to increase both the numbers of new entrants and educational routes into the sector. This involves schools, colleges and universities working in partnership with industry to ensure that these courses remain relevant to industry requirements.

- Plans for a Digital **Gender Action Plan** (due November 2016) to encourage more young women to enter the Digital Technologies sector.

- Investment in **Cyber Security skills** and promotion of the careers opportunities available in this key sector of the digital economy. For example, opportunities for senior pupils to attend a residential Cyber Camp at Glasgow Caledonian University and a Cyber Skills day for girls at Napier University, through a partnership with GCHQ.

- A new **Digital Skills Partnership** building stronger links between employers, colleges and universities with a view to improved knowledge sharing and the potential for specific courses to be quality assured. This will ease the transition between education and employment for many young people.

This wide-ranging series of actions will help to equip all young people with the digital skills they need to thrive in modern society and the workplace, creating a pathway into high quality careers in the Digital Technologies sector and wider economy, thereby increasing national productivity and growth.

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