Digital Strategy for Schools

2015-2020

ENHANCING TEACHING, LEARNING AND ASSESSMENT

AN ROINN OIDEACHAIS AGUS SCILEANNA | DEPARTMENT OF EDUCATION AND SKILLS

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FOREWORD

The publication of the Digital Strategy for Schools is the first step in an exciting and ambitious programme which will further embed technology and digital learning tools in primary and post-primary schools. This will greatly enhance the learning experience and lifelong learning skills of all our students. This new Strategy builds on the progress made under the 2008 Strategy, *Investing Effectively in Information and Communications Technology in Schools, 2008-2013*.

The Digital Strategy for Schools is the result of extensive research and consultation and reflects the views of education stakeholders including young people. I would like to thank the Strategy Development Group for their great commitment to the process. The end result is a document which sets out a clear vision for the role of Information and Communications Technology (ICT) in teaching, learning and assessment for schools in Ireland. In making this vision a reality, the Strategy will enable all stakeholders to work together to support the integration of ICT in every classroom in a systematic and focussed way. This is how we must work because ICT is a powerful tool that can change the way teachers teach and how students learn.

I want to encourage all teachers to use ICT in the classroom to bring learning to life for students; to give learners the tools to collaborate and to examine engaging problems; to research and analyse information; and to use ICT resources to communicate their ideas and to share what they create with others beyond the walls of their classroom or school. I recognise that for this to happen my Department must show leadership and provide the necessary supports to schools and teachers.

Modernising the curriculum, to embed digital learning, will be a very important part of our work over the life of the Strategy and this will be particularly important in the Senior Cycle. The NCCA will ensure that future curriculum specifications will incorporate clear statements of learning that focus on developing digital learning skills and the use of ICT in achieving learning outcomes at all levels of education. Recognising the importance of progression to further and higher education, the Strategy will support the development of opportunities for learners to undertake in-depth study of ICT in the Senior Cycle. The Strategy will impact the continuum of teacher education from initial education through induction and continuing professional development.

My Department's support services will also play a crucial role in promoting the use of technology in the classroom. Over the lifetime of the Strategy, schools will have access to more advice and support to allow them to integrate technology in a meaningful way in the classroom. The 2009 handbook, Planning and Implementing e-Learning in your School, for principals and ICT co-ordinating teachers will be updated and will be a key resource for schools. I recognise that schools require funding to support the infrastructure in schools and I am pleased that a very significant capital allocation will be made available to assist schools.

My Department and its agencies will work together to provide the necessary support to schools to facilitate the embedding of ICT in our education system and I urge all schools, and their communities, to embrace the opportunities afforded by the use of digital technologies in the classroom.

Jan O'Sullivan, T.D.,
Minister for Education and Skills
October 2015

EXECUTIVE SUMMARY

The Digital Strategy for Schools provides a rationale and a Government action plan for integrating ICT into teaching, learning and assessment practices in schools over the next five years. This Strategy builds on previous strategies in the area of ICT integration and it takes cognisance of current education reforms that are already underway within the education system at primary and post-primary level. This Strategy focuses on the schools' sector and the proposed actions are designed to embed ICT more deeply across the system to enhance the overall quality of Irish education. Care has been taken, in developing the Strategy, to ensure that the actions align with and complement strategies and initiatives to support digital learning in the further education and higher education sectors.

In developing this Strategy, the Department adopted an evidence-based approach. A *Census Report* was initially conducted to provide base-line data on the levels and usage of ICT by teachers and schools. Arising from this research a consultative paper, Building Towards a Learning Society: A National Digital Strategy for Schools (2013), was published and its publication coincided with the launch of a public consultation phase. One hundred and twenty-four (124) submissions were received from various organisations and individuals on the content of the consultative paper and these views were further augmented by face-to-face meetings with a number of stakeholder groups. The feedback and views from this phase were subsequently combined with international research on the integration of ICT to formulate the Strategy. The voice of the young people is reflected in the Strategy.

The Strategy articulates that all stakeholders need to take responsibility for embedding ICT into their existing practices. The *Census Report* data, along with a number of submissions, highlighted that many people currently view ICT as something peripheral and not core to teaching, learning and assessment. However, the Strategy states that meaningful ICT integration is the responsibility of all and is a key component of a high-quality 21st century education system.

We live in a world that is characterised by abundant information, advanced technology, a rapidly changing society, greater convenience in daily lives and keener international competition. Therefore, it is important that all stakeholders are proactive and take a leadership role in identifying how ICT can enhance our education system, particularly in the areas of teaching, learning and assessment. The Department will provide leadership and support to schools so that they take ownership of this challenge and identify how best to achieve ICT integration locally. Thus, ICT integration is a central pillar within the Strategy.

The Department's vision for ICT integration in Irish schools is to:

> Realise the potential of digital technologies to enhance teaching, learning and assessment so that Ireland's young people become engaged thinkers, active learners, knowledge constructors and global citizens to participate fully in society and the economy.

KEY THEMES

The Strategy has been developed around four key themes which were identified from the *Census Report*.

- **Theme 1:** Teaching, Learning and Assessment Using ICT
- **Theme 2:** Teacher Professional Learning
- **Theme 3:** Leadership, Research and Policy
- **Theme 4:** ICT Infrastructure

THEME 1: TEACHING, LEARNING AND ASSESSMENT USING ICT

ICT can play a central role in transforming teaching, learning and assessment practices for teachers and students, in a high-quality 21st century education system. The Department recognises that teachers and schools are constantly engaged in enhancing how they teach, how their students learn and how learning is assessed. An essential part of this continuous improvement, in how we enable students to learn effectively, must be to further embed ICT into our education system at all levels.

It is recognised internationally that meaningful ICT integration can be challenging to achieve and that schools need guidance and support to achieve it. All too often schools are not clear as to what ICT integration looks like and therefore are unsure how they can achieve it. The Strategy will provide advice and guidance for teachers and schools, including examples of good practice on the use of ICT for teaching. In addition, the Department will continue to include clear statements regarding digital skills and learning outcomes in new curricula throughout the lifetime of the Strategy and beyond.

The Strategy will adapt the UNESCO ICT Competency Framework for Teachers so that schools will have greater clarity around the concept of ICT integration. The existing UNESCO Framework was developed for teachers around the globe and there is a need to localise it for the Irish context. By localising the UNESCO ICT Competency Framework for Teachers it will allow the Department's support services and others to provide more appropriate support materials and services to principals and teachers on embedding ICT into their practice. This will be a central focus of the Strategy and it will be reviewed at various intervals and levels between 2015 and 2020.

THEME 2: TEACHER PROFESSIONAL LEARNING

Teachers, along with principals, will be instrumental in ensuring that ICT integration is achieved. There is a need to ensure that ALL teachers are equipped with the knowledge, skills and confidence to integrate ICT into their practice. The use of ICT for teaching, learning and assessment will be embedded at each stage of the continuum of teacher education, i.e. Initial Teacher Education, Induction and Continuous Professional Development. This will provide multiple opportunities for teachers, across the continuum of teacher education, to become more knowledgeable and confident in achieving ICT integration. The Teaching Council's policies on teacher education will recognise the role and potential of ICT to enhance teaching and learning in schools.

The UNESCO ICT Competency Framework for Teachers will play a pivotal role in informing the design of all future teacher professional learning opportunities. The Department support services and others involved in teacher education will be encouraged to embed the use of ICT in CPD design,

development and delivery. The Strategy will provide schools with guidance and examples of good practice on the effective, critical, and ethical use of ICT for teaching, learning and assessment. These examples will reflect real classroom practice in action.

THEME 3: LEADERSHIP, RESEARCH AND POLICY

There is a need for distributed leadership in order to truly integrate ICT across our education system. The Department and its agencies will provide strong leadership in supporting schools to effectively integrate ICT into teaching, learning and assessment. However, this will not be enough. School management and other key stakeholders will also have to provide leadership and take ownership of this challenge so that we achieve ICT integration and equip learners with the digital competencies that we value.

The Strategy recognises the central role of evaluation in monitoring implementation and ensuring that the system is making progress towards ICT integration. It is also important that schools, and other education providers, capture and share innovative practice with the wider teaching community to enhance the overall educational experiences of our young people. By developing a strong research-base, the entire system, will be better informed regarding how to best integrate ICT.

The Strategy acknowledges that ICT also has the potential to be misused in schools and the Department will continue to provide guidance, planning resources and related supports for the effective, safe and ethical use of ICT to school leaders and teachers. Furthermore, the Strategy will facilitate schools to create linkages with existing school policies, for example School Self-Evaluation, so that ICT is embedded deeply within the school.

THEME 4: ICT INFRASTRUCTURE

Over recent years, the Department has invested in national ICT infrastructure, specifically in the rollout of 100/Mbit/sec broadband services to all post-primary schools and a number of special schools with post-primary students. This programme is jointly funded by the Department of Communications, Energy and Natural Resources (DCENR) and the Department of Education and Skills. The provision of improved connectivity to primary schools will commence during the lifetime of this Strategy so that all schools have improved access to the internet.

The internet is playing an increasingly important part in all our lives and the Strategy has identified recent trends regarding the role of cloud computing in education and students bringing their own devices to schools. The Strategy will provide advice and support to schools in relation to these new trends, so that principals and teachers make better-informed local decisions. It also recognises that schools face challenges in acquiring appropriate technical support. The Department will evaluate a number of technical support options with a view to providing guidance on the best technical support solution for schools.

Schools will also need to upgrade their ICT equipment and the Department, working with the Office of Government Procurement (OGP) and the School Procurement Unit (SPU), will continue to ensure the provision of frameworks and advice for the purchase of equipment such as printers, desktop PCs and notebooks. Funding, in the form of school grants, will be provided for the purchase of such equipment.

KEY STRATEGY PRINCIPLES

The Department has developed a series of actions under each of the above themes to progress ICT integration over the lifetime of the Strategy. As noted earlier, there is a need for multiple stakeholders to adopt leadership roles in attaining the thirty six objectives outlined in the Strategy and this will be essential in achieving success by 2020.

These objectives and the entire strategy are underpinned by five key principles which were identified during the consultation and research phase. These principles are listed below.

Principle	Descriptor
1. A Constructivist Pedagogical Orientation underpinning the embedding of ICT in schools.	A constructivist pedagogical orientation supports teachers in effectively using ICT with their students i.e. learners are actively involved in a process of determining meaning and knowledge for themselves.
2. The use of ICT in teaching, learning and assessment can enhance the learning experiences of all students.	ICT plays an important role in supporting inclusion and diversity for all learners by enhancing learning opportunities for all students.
3. The use of ICT in teaching, learning and assessment is embedded in school curricula, Department policies and teacher education.	The Department and its agencies will play a proactive role in implementing the Digital Strategy for Schools.
4. ICT is used in an ethical and responsible way.	Schools and the Department enable all users to use ICT in an ethical and safe way.
5. ICT Planning is required to ensure ICT integration in teaching, learning and Assessment.	All levels of the education system are engaged in inclusive planning for the effective integration of ICT.

These principles are designed to ensure that the Department, school authorities, school leaders and all key stakeholders play a proactive role in enhancing our education system by integrating ICT more effectively.

The Strategy recognises that schools are at different stages of their journey towards ICT integration and there is an acknowledgment that a one-size-fits-all approach will not achieve success.

In consideration of this, the Strategy will support schools to identify where they are on this journey and will provide a range of supports to assist them move ICT integration forward over the next five years.

1. INTRODUCTION

CONTEXT

This Digital Strategy for Schools (the Strategy) sets out the vision of the Department of Education and Skills (the Department) to embed Information and Communications Technologies (ICT) in teaching, learning and assessment in Irish primary and post-primary schools in the period 2015-2020.

The Programme for Government (2011-2016)[1] commits to integrating ICT more deeply into the education system. The Strategy maps out how this commitment can be realised and the ways in which ICT can be used by schools to broaden and enhance teaching, learning, and assessment practices.

This Strategy endorses the definition of ICT as "a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information"[2]. While this Strategy acknowledges the emergence of newer terms, such as digital technologies, digital learning tools, digital devices and digital learning, the term ICT is used throughout this document.

EDUCATION REFORM

With the development of the Strategy, the Department is looking to integrate ICT more deeply into the Irish education system over the next five years. Under the Government reform agenda for the public services, ICT is viewed as having a central role in the provision of better and more effective services. Research (such as Kozma 2008)[3] recommends that, where possible, ICT integration should be associated with a wider educational reform programme similar to that which is currently underway in Ireland.

There is a broad reform programme currently underway within the Department, which impacts institutional, policy and operational levels in education. The enactment of the Teaching Council Act 2001[4] and subsequent related legislation herald a new era for the teaching profession in terms of standards and regulation. Initial teacher education programmes have been reconfigured and modernised and work is underway on the development of a continuing professional development framework for teachers, which will outline standards and expectations.

Reform is also underway on what is taught in our schools. Key statements of strategy and curriculum in this regard include:

- The National Strategy to improve Literacy and Numeracy among Children and Young People (2011-2020), (Department of Education and Skills, 2011).
- Key Skills Framework (NCCA, 2009); Framework for the Junior Cycle (Department of Education and Skills, 2015).
- School Self-Evaluation (Department of Education and Skills, 2012).
- Project Maths curriculum at post primary level (NCCA, 2008).
- A new Primary Language Curriculum is at an advanced stage of development.
- A strategy to embed technology-enhanced learning within the further education and training

[1] Statement of Common Purpose 2011-2016 (http://www.taoiseach.gov.ie/eng/Work_Of_The_Department/Programme_for_Government/Programme_for_Government_2011-2016.pdf)
[2] New Directions for ICT-Use in Education (1999) (http://www.unesco.org/education/lwf/dl/edict.pdf)
[3] ICT, Education Reform and Economic Growth (2008) (http://download.intel.com/education/EvidenceOfImpact/Kozma_ICT_Framework.pdf)
[4] Teaching Council Act (2001) (http://www.oireachtas.ie/documents/bills28/acts/2001/a801.pdf)

system in Ireland is under development while higher education has also embarked on developing a digital roadmap for their sector.

The current education reform programme is driven by a shared policy understanding focussed on school improvement, raising standards and better outcomes for all learners.

The Strategy links with other Government policies, such as, the National Digital Strategy, which has improved broadband connectivity as its main aim. The Strategy aligns with, and supports the ICT Skills Action Plan[5], which aims to ensure our young people have the necessary knowledge and skills to contribute to and participate in modern society.

The Strategy will help foster a culture of whole-school planning and preparation that involves an examination of current practices, and new developments in curriculum, with a view to implementing change. In this way, schools prepare for change and are better positioned to meet both student and society needs.

In developing the Strategy, the Department has taken account of the recent economic challenges and the ongoing pressures on public finances while looking to the future and the anticipation of economic growth.

BUILDING ON ICT POLICY TO DATE

Since 1997, the Department has been investing in the introduction of ICT in schools, beginning with the publication of *Schools IT 2000* (Department of Education, 1997)[6]. Subsequent policy documents have built on this initial policy framework.

In 2008, the Department's Inspectorate carried out an evaluation of how ICT is used in Irish schools. The resultant report titled, *ICT in Schools*, highlights positive aspects of ICT usage in schools, but also points to deficiencies in infrastructure, technical support, and the integration of ICT in teaching and learning (Department of Education and Science, 2008)[7]. That same year, the Department published, *Investing Effectively in ICT in Schools* (Department of Education and Science, 2008)[8], a report produced by the ICT Strategy Group, which was appointed to advise the Department on the ICT investment priorities in Schools at that time. These two documents were later followed by *Smart Schools=Smart Economy* (Department of Education and Science, 2009)[9] and the allocation of €92 million to schools in the form of government grants. These documents contain the most recent plans and recommendations in relation to the usage of ICT in schools. This Strategy considers and builds on these policies so as to better achieve ICT integration in schools.

THE ROLE OF ICT IN TEACHING, LEARNING AND ASSESSMENT

ICT is now pervasive in society and it continues to transform how we live our daily lives. It has the potential to support transformation in teaching, learning and assessment practices in schools and it can connect educational policy with economic and social development (Butler et al., 2013)[10].

[5] ICT Skills Action Plan (http://www.education.ie/en/Publications/Policy-Reports/ICT-Skills-Action-Plan-2014-2018.pdf)
[6] Schools IT 2000: Full Report (http://www.education.ie/en/Publications/Policy-Reports/Schools-IT2000.pdf)
[7] ICT in Schools: Inspectorate Evaluation Studies (2008) (http://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/ICT-in-Schools-Inspectorate-Evaluation-Studies.pdf)
[8] Investing Effectively in Information and Communications Technology in Schools 2008-2013 (http://www.ncte.ie/media/Final%20ICT%20Strategy_group_report.pdf)
[9] Smart Schools = Smart Economy (https://www.education.ie/en/Publications/Policy-Reports/Smart-Schools=Smart-Economy.pdf)
[10] Digital Strategy for Schools Consultative Paper (2013) (http://www.education.ie/en/Schools-Colleges/Information/Information-Communications-Technology-ICT-in-Schools/Digital-Strategy-for-Schools/Building-Towards-a-Learning-Society-A-National-Digital-Strategy-for-Schools-Consultative-Paper.pdf)

There is growing evidence that "digital technologies change the way students learn, the way teachers teach, and where and when learning takes place" (21st Century Learning Reference Group, 2014; p.4)[11]. There is widespread understanding that learning today needs to entail more than knowledge-acquisition; there needs to be an equally strong emphasis on skill-development, particularly 21st century skills or Key Skills[12].

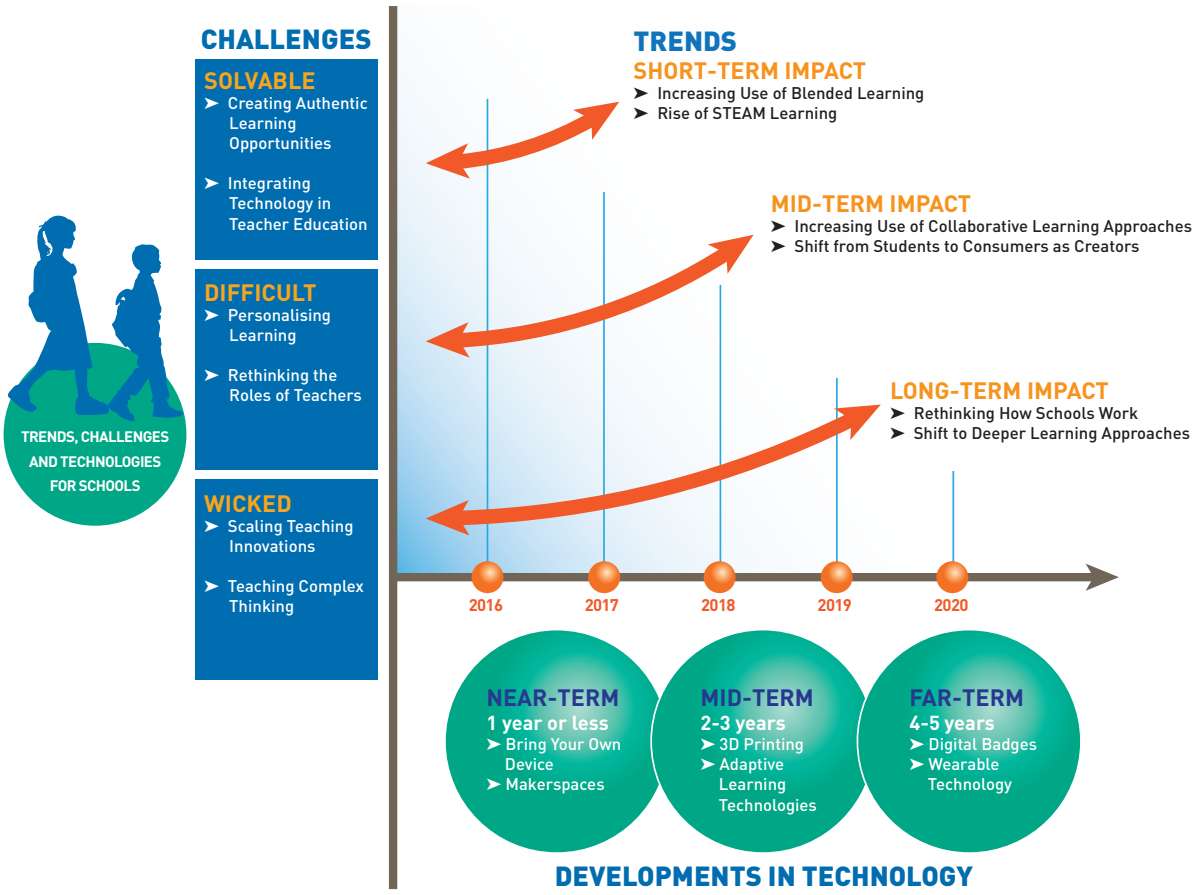
Learners need "more open-ended learning experiences that develop the learners' higher-order thinking, creativity, independence, collaborating and ownership of learning" (Department of Education and Skills, 2013; p.20)[13]. When ICT is used effectively, it can provide opportunities for all teachers, students and parents/guardians to develop these Key Skills.

Embedding ICT in teaching, learning and assessment is a complex endeavour and the mere presence of ICT in a school does not equate to its effective use (OECD, 2015)[14]. The 2013 ICT in Schools Census Report[15] (Cosgrove et al., 2013a), herein after referred to as the *Census Report*, found that ICT has often taken the place of older technologies, such as books or whiteboards, and the role of the teacher and the learner remains unchanged. Furthermore, the Horizon Report Europe 2015 K12 Edition[16] identifies main trends, developments in technology and challenges that are very likely to impact on education across the world. Referenced trends include rethinking how schools work and a shift from students as consumers to creators. Major challenges identified include rethinking the role of teachers and scaling teaching innovations (see Figure 1).

The *Census Report* highlights the potential role of ICT in helping to transform teaching, learning and assessment practices in a very positive way over the next five years. Ultimately, such transformation will serve to enhance student learning and prepare our young people to live, learn and work in a modern globalised society.

[11] Future Focused Learning in Connected Communities (2014) (http://www.education.govt.nz/assets/Documents/Ministry/Initiatives/FutureFocusedLearning30May2014.pdf)
[12] Current policy trends and issues in teacher education and curricular reform (2013) (http://www.education.ie/en/Press-Events/Speeches/2013-Speeches/SP13-02-22.html)
[13] Chief Inspector's Report (2010-2012) (http://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/Chief-Inspector%E2%80%99s-Report-2010-2012-Main-Report.pdf)
[14] OECD, New approach needed to deliver on technology's potential in schools (2015) (http://www.oecd.org/education/new-approach-needed-to-deliver-on-technologys-potential-in-schools.htm)
[15] The 2013 ICT Census in Schools - Main Report (http://www.erc.ie/documents/ict_census2013_mainreport.pdf)
[16] NMC Horizon Report (2015) (http://www.nmc.org/publication/nmc-horizon-report-2015-k-12-edition/)

FIGURE 1. NMC HORIZON REPORT 2015 K12 EDITION



A VISION FOR ICT USE IN SCHOOLS

ICT integration is a priority for the Department because, when effectively carried out, our learners are equipped and prepared to live and work in today's complex society. Conscious of this, the Department's vision for ICT integration in Irish schools is to:

Realise the potential of digital technologies to enhance teaching, learning and assessment so that Ireland's young people become engaged thinkers, active learners, knowledge constructors and global citizens to participate fully in society and the economy.

To achieve this, our schools have a major role in ensuring that our students have the opportunity to develop a range of key skills throughout their primary and post-primary school journey. We must ensure, that at the end of the Senior Cycle, students have acquired these key skills and a sound base of ICT competencies that will support their learning on transition to further or higher education.

The Department recognises that all of the education partners - teachers, management bodies, teacher unions, parent associations, Initial Teacher Education (ITE) providers, Higher Education (HE) Institutes Further Education (FE) and Training – also have a major role to play in achieving this vision.

To realise the Department's vision of ICT integration, the Strategy foresees the roles of students, teachers, schools, parents/guardians, and the role of the curriculum as varied and significant. The Strategy envisions:

Students:

- Using ICT to open up new forms of learning and collaboration to support different styles of learning.
- Experiencing joy, satisfaction, passion and success in their education and lifelong learning.
- Actively engaged in learning – both in and out of school.
- Accepting ownership of their learning – involving the ability to be self-directed, a decision-maker, and a manager of priorities in and out of school.
- Using technology to achieve personal learning goals and to succeed in various learning activities (Adapted from McGinn, 2007).
- Using ICT critically and ethically.

Teachers:

- Taking a more facilitative role, providing student-centred guidance and feedback, and engaging more frequently in exploratory and team-building activities with students.
- Using ICT to "support an enquiry process and enable their students to work on solving complex real-world problems" by engaging in "collaborative project-based learning activities that go beyond the classroom" (Butler et al., 2013; p.8).
- Supporting students to create and innovate so that they are engaged in managing their own learning goals and activities.
- Accepting ownership of their own professional learning and, where appropriate, designing and participating in learning communities that make extensive use of technology.

Schools:

- Taking a lead role in planning how they will effectively embed ICT in teaching, learning and assessment practices. This means involving the entire school community in developing an e-Learning plan that takes into account the CPD needs of teachers, and the views and insights of students and parents/guardians.
- Developing policies and practices for the safe and ethical use of ICT by all members of the school community.
- Strengthening their existing relationships with the wider community, both local and global, and in particular, connecting more with parents/guardians and students in their homes through the use of digital technology.

Parents/Guardians:

- Engage with their children's learning through the use of digital technologies.
- Collaborate with and participate in school activities and programmes using ICT.

Curriculum:

- All future curricula will include clear statements that focus on the development of digital learning skills and the use of ICT as a resource in achieving specific outcomes across the curriculum.
- Curriculum specifications will support in-depth study of ICT and specialised application of ICT tools as appropriate.

Department of Education and Skills and its Agencies:

- Enabling all partners to effectively embed ICT across the continuum of teacher education and in our schools. The Department will also monitor and evaluate the implementation of the Strategy on an annual basis.

Thus, the Strategy builds on existing Departmental policy, which strives to equip "all learners with the knowledge and skills they need to participate fully in society and the economy, one that enables all learners to learn how to learn" (Public Sector Reform Plan 2014-2016, 2014; p.43)[17]. In this way, the Strategy supports the Department's Statement of Strategy (2015 – 2017)[18] by playing a pivotal role in the ongoing transformation of learning in primary and post-primary schools.

THE CONCEPT OF ICT INTEGRATION

To bring this vision to life, the Department is committed to integrating ICT across the system through a process of 'ICT integration'.

The concept of ICT integration is regularly used in national strategies and policies, however it is rarely defined. All too often it is assumed that simply the presence of ICT (i.e. computers, broadband etc.) in a school will organically lead to ICT integration (Lim and Khine, 2006; OECD, 2015). However, it is now recognised that the integration of ICT into teaching, learning and assessment is a complex and challenging process (Qablan, et al., 2009; Brown 2004 in Jamieson-Proctor et al., 2006).

The concept of effective ICT integration goes well beyond the introduction of ICT into schools and needs to be considered within the wider context of school-improvement with issues such as:

- education change;
- school leadership;
- professional development and support;
- evaluation systems; and
- sharing of professional practice with other teachers and schools (Tondeur, Braak and Valcke, 2008).

In essence, to benefit from the full impact of ICT integration, ICT should be embedded into the school culture. This often entails redesigning "educational infrastructure, teacher training [approaches], curriculum structures and materials, classroom practices and modes of assessment" (Livingstone, 2012; p.22)[19].

[17] Public Service Reform Plan 2014-2016 (http://www.reformplan.per.gov.ie/2014/downloads/files/Reform%20Plan%202014.pdf)
[18] Statement of Strategy 2105-2017 (http://education.ie/en/Publications/Corporate-Reports/Strategy-Statement/Department-of-Education-and-Skills-Statement-of-Strategy-2015-2017.pdf)
[19] Critical Reflections on the Benefits of ICT in Education (2012) (http://eprints.lse.ac.uk/42947/1/__libfile_repository_Content_Livingstone,%20S_Critical%20reflections_Livingstone_Critical%20reflections_2014.pdf)

Teachers and school leaders also require considerable support in bringing about meaningful ICT integration (Lai and Pratt, 2004 in Tondeur, Cooper and Newhouse, 2010). This support enables schools to successfully foster a culture of innovation and design more authentic learning experiences for students where they are actively engaged with ICT. The Strategy will support schools to advance the process of integrating ICT more deeply into their teaching, learning and assessment strategies over the next five years.

PURPOSE OF THE STRATEGY

As outlined in earlier sections, a number of education reform initiatives are underway to ensure our education system can meet the challenges of the 21st century. This reform programme targets Early Years Education right through to higher education and further education and training. The Strategy will serve to enhance existing reforms and it will inform those that will be implemented over the coming years. This will be achieved through all future curricula reforms taking account of the key role ICT can play in helping transform our education system so that our learners are equipped with the knowledge and skills required for the challenges posed by a rapidly changing world.

ICT in World Education

The availability of abundant information, advanced technology, a rapidly changing society, greater convenience in daily lives and keener international competition are impacting on education systems and on how we educate our young people and learners of all ages to live and work in this digitally connected world. To accommodate for this much changed world, many countries, such as Australia, Singapore and New Zealand are transforming their education systems so that progressive ICT use is embedded into teaching, learning and assessment activities in schools.

There is also an understanding in the world of business that ICT is changing "job profiles and skills, while offering possibilities for accelerated learning" (The World Bank Group, 2011; p.7)[20] and that all countries are now facing challenges in order to prepare young people "for the world of work and the jobs available in today's 21st century society" (Ibid; p.38). These developments are driving the need for a comprehensive Strategy around the integration of ICT into our school system.

ICT in National Education

The Irish Government appreciates the need to prepare our young people for this evolving world. This understanding is reflected in the ICT Skills Action Plan[21], a joint initiative between the Department of Education and Skills and the Department of Jobs, Enterprise and Innovation.

The National Digital Strategy (NDS) published by the Department of Communications, Energy and Natural Resources (DCENR, 2013) is a further step in helping Ireland to reap the full rewards of a digitally-enabled society. The NDS is one part of the overall Government commitment to creating a more digitally-empowered society and education system, which involves a suite of complementary national and regional measures[22].

There has also been a focus on the role of ICT in the Higher Education (HE) sector with the establishment of the National Forum on the Enhancement of Teaching and Learning in Higher Education[23]. The Forum has placed a major emphasis on building digital capacity within the HE

[20] World Bank - Learning for all, Investing in peoples' knowledge and skills for development (2011) (http://siteresources.worldbank.org/EDUCATION/Resources/ESSU/Education_Strategy_4_12_2011.pdf)
[21] ICT Skills Action Plan 2014-2018 (http://www.education.ie/en/Publications/Policy-Reports/ICT-Skills-Action-Plan-2014-2018.pdf)
[22] National Digital Strategy (http://www.dcenr.gov.ie/communications/en-ie/Digital-Strategy/Pages/home.aspx)
[23] National Forum on the Enhancement of Teaching and Learning in Higher Education (http://www.teachingandlearning.ie/)

sector and has recently published a digital roadmap for institutions to assist them integrate ICT more deeply into their practice.

This Strategy, like the aforementioned Governmental policy approaches, strives to enhance the quality of our education system.

PRINCIPLES UNDERPINNING THE STRATEGY

In developing the Strategy, the Department engaged in an extensive research and consultation process, which is outlined in the next section. A number of key principles were identified during this phase of developing the Strategy and they will inform the goals and actions outlined in the Strategy.

TABLE 1: KEY PRINCIPLES INFORMING THE DIGITAL STRATEGY FOR SCHOOLS

Principle	Descriptor
1. A Constructivist Pedagogical Orientation underpinning the embedding of ICT in schools.	A constructivist pedagogical orientation supports teachers in effectively using ICT with their students i.e. learners are actively involved in a process of determining meaning and knowledge for themselves.
2. The use of ICT in teaching, learning and assessment can enhance the learning experiences of all students.	ICT plays an important role in supporting inclusion and diversity for all learners by enhancing learning opportunities for all students.
3. The use of ICT in teaching, learning and assessment is embedded in school curricula, Department policies and teacher education.	The Department and its agencies will play a proactive role in implementing the Digital Strategy for Schools.
4. ICT is used in an ethical and responsible way.	Schools and the Department enable all users to use ICT in an ethical and safe way.
5. ICT Planning is required to ensure ICT integration in teaching, learning and Assessment.	All levels of the education system are engaged in inclusive planning for the effective integration of ICT.

METHODOLOGY IN DEVELOPING THE STRATEGY

An evidence-based approach was used to develop the Strategy and it was informed by a number of phases. The ICT Policy Unit of the Department led the preparation of the Strategy and established the Digital Strategy Development Group to support its development.

This group met regularly during the development of the Strategy and their work was informed by evidence gathered from a range of sources.

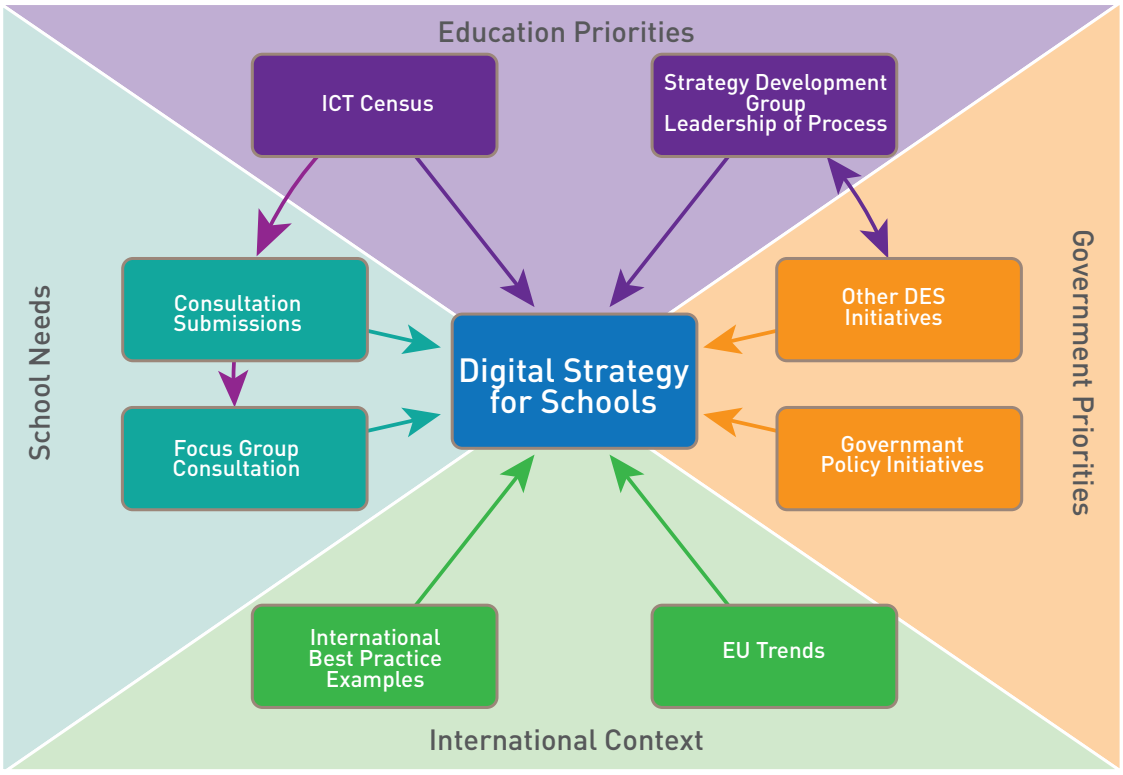
Michael Hallissy and John Hurley of H2 Learning supported the consultation, evidence gathering and analysis leading to final Digital Strategy Development Group recommendations, and assisted the Department in the writing of this Strategy.

These sources included:

- Analysis of the 2013 online census of teachers and principals (see Appendix 1).
- Consultative paper 'Building Towards a Learning Society: A National Digital Strategy for Schools Consultative Paper (Butler et al; 2013)[24] .
- Consultations with children, young people, parents/guardians and teachers (see Appendix 2).
- Public consultation phase which generated 124 written submissions (see Appendix 3).
- Face-to-face meetings with key stakeholders during the course of developing the Strategy (see Appendix 4).

The main elements of the consultation and research phases are captured in Figure 2 below.

FIGURE 2. THE STRATEGY DEVELOPMENT PROCESS



The *Digital Strategy Development Group* identified four key themes (see Table 2) that emerged from the research and consultation phase and these have been adopted as main content headings within the Strategy.

[24] Digital Strategy Consultative Paper (http://www.education.ie/en/Schools-Colleges/Information/Information-Communications-Technology-ICT-in-Schools/Digital-Strategy-for-Schools/Building-Towards-a-Learning-Society-A-National-Digital-Strategy-for-Schools-Consultative-Paper.pdf)

TABLE 2. THEMES AND SUBTHEMES IDENTIFIED IN THE 2013 ICT IN SCHOOLS CENSUS REPORT

Broad Theme	Subtheme
Theme 1 ***Teaching, Learning and Assessment Using ICT***	Use of ICT in Teaching and Learning. Developing 21st Century Skills Using ICT. Assessment and ICT. Internet Safety (including critical and ethical use of the internet). Digital Content for Schools. Inclusion.
Theme 2 ***Teachers' Professional Learning***	Specifying Teacher Professional Knowledge. Supporting Teacher Professional Learning.
Theme 3 ***Leadership, Research and Policy***	National and School Leadership, Planning and Research as a Driver of Policy.
Theme 4 ***ICT Infrastructure***	Internet Connectivity. Access to Computing Devices and Other Technologies. Technical Support and Maintenance. Purchasing and Procurement.

These four themes form the backbone of the Strategy and are outlined in the following sections of this document. Each theme contains an introductory narrative and a set of associated actions.

2. THEME 1: TEACHING, LEARNING AND ASSESSMENT USING ICT

The concept of teaching and learning through the use of ICT is highly complex. The introduction of ICT into a learning environment does not in and of itself bring about change in pedagogical practice.

(Butler et al., 2013; p.5)

INTRODUCTION

ICT has a key role to play in enhancing teaching, learning and assessment practices for teachers and students in primary and post-primary schools. However, schools find it difficult to effectively integrate ICT into their everyday practice. The *Census Report* findings show that the difficulty in integrating ICT arises from traditional school practices rather than teachers' views of teaching.

The *Census Report* also notes that the majority of Irish teachers hold constructivist views of teaching, where learners are actively involved in a process of determining meaning and knowledge for themselves as opposed to being told meaning and knowledge. Constructivist teaching approaches aim to foster critical thinking and to create motivated and independent learners. While teachers hold these views, traditional teacher-directed practices were found to be the dominant pedagogical orientation in most schools.

In this section, a number of the main issues that emerged from the Strategy's research phase will be explored, as will a series of actions that should be taken to address these issues (as outlined in the table at the end of this section).

GOAL: TEACHING, LEARNING AND ASSESSMENT USING ICT – INDICATORS OF SUCCESS

- **Inclusion of clear statements regarding digital skills and learning outcomes in new curriculum specifications.**
- **UNESCO Competency Framework adapted for the Irish context and piloted.**
- **eLearning planning resource for schools updated.**
- **Provision of advice and guidance for teachers and schools including examples of good practice on the use of ICT for teaching, learning and assessment.**
- **High-quality digital content available to support learning and teaching.**

ICT COMPETENCY FRAMEWORK FOR TEACHERS

The consultative paper (Butler et al, 2013) for the Strategy recommends that the UNESCO ICT Competency Framework for Teachers (ICT CFT) (2008, 2008a and 2011) should be used to guide schools in the implementation and review of the Strategy at school level over the next five years.

The framework is comprised of six aspects of a learning system, and it "provides a lens to conceptualise what being digital in learning can look like" (Ibid; p.2), as depicted in Figure 3 below.

FIGURE 3: THE UNESCO ICT COMPETENCY FRAMEWORK FOR TEACHERS

	TECHNOLOGY LITERACY	KNOWLEDGE DEEPENING	KNOWLEDGE CREATION
UNDERSTANDING ICT IN EDUCATION	Policy awareness	Policy understanding	Policy innovation
CURRICULUM AND ASSESSMENT	Basic knowledge	Knowledge application	Knowledge society skills
PEDAGOGY	Integrate technology	Complex problem solving	Self management
ICT	Basic tools	Complex tools	Pervasive tools
ORGANISATION AND ADMINISTRATION	Standard classroom	Collaborative groups	Learning organisations
TEACHER PROFESSIONAL LEARNING	Digital literacy	Manage and guide	Teacher as model learner

The UNESCO ICT Competency Framework[25] provides a lens for monitoring how ICT can support such transformation in schools. The framework identifies three complementary and overlapping approaches connecting education policy with economic and social development through the use of ICT. These approaches are defined as *technology literacy*, *knowledge deepening* and *knowledge creation*. The three approaches are described as follows:

- Increasing the extent to which new technology is used by students, citizens and the workforce by incorporating technology skills into the school curriculum — the Technology Literacy approach.
- Increasing the ability of students, citizens, and the workforce to use knowledge to add value to society and the economy by applying it to solve complex, real-world problems — the Knowledge Deepening approach.
- Increasing the ability of students, citizens, and the workforce to innovate, produce new knowledge, and benefit from this new knowledge — the Knowledge Creation approach.

(UNESCO, 2011; p.7).

Viewed in this way, ICT can help transform all aspects of education, particularly at primary and post-primary level.

Utilising the ICT Competency Framework

The ICT Competency Framework is a useful way to gauge what has been accomplished in Ireland

[25] UNECSO ICT Competency Framework for Teachers (http://unesdoc.unesco.org/images/0021/002134/213475e.pdf)

to date in terms of ICT integration and to provide an indication of areas that need to be addressed over the lifetime of the Strategy. It can be used by schools to measure ICT integration at the school level and by professional development providers to ensure there is a range of professional learning opportunities for teachers. The framework will also provide clear standards for teachers in relation to how they can enhance the connections between innovative ICT practices and effective teaching and learning approaches.

However, it must be stressed that each element of the framework is just one element of an interrelated and interdependent system. For change to occur within schools to allow for ICT integration, there must be movement across and between all the components of the framework.

Used in this way, the ICT Competency Framework can assist the education system, including teachers and principals, to reflect on their existing practice, to inform decision-making and to support continuous improvement and system change.

ICT Competency Framework in the Irish Context

There is a need to review and adapt the ICT Competency Framework in its current form, in order to make it more directly relevant to the Irish context. The development of a competency-based framework that is localised for Ireland will provide clarity for teachers in terms of how they can effectively integrate ICT into their practice. Furthermore, the creation of such a framework has the capacity to inform teacher professional learning activities at all stages of teachers' careers. This idea is further explored in the section on Teacher Professional Learning.

PEDAGOGICAL ORIENTATION

The consultation conducted in the development of the Strategy confirmed that schools are seeking a clear understanding and examples of what ICT integration looks like across the system. Teachers and school leaders will require support to develop their pedagogical orientation and their ICT competencies.

ICT and constructivist teaching approaches

Research studies (for example Butler et al., 2014 and OECD 2015) indicate that a teacher's pedagogical orientation is a principal factor in how he/she uses digital technology in the classroom. Effective use of digital technology is associated primarily with constructivist approaches to teaching. Where constructivist teaching approaches are used, learning experiences often include the following features:

- Engagement with the learner's prior understanding.
- Active involvement of the learner in the learning process.
- Opportunities for the learner to make decisions that affect the subsequent course of the learning activity.
- A high level of interaction and exchange of ideas between learners.

Constructivist teaching approaches are advocated in the curricula and syllabi used in primary and post-primary schools in Ireland. This is reflected in the Education and Training Sector Integrated Reform and Delivery Plan (Department of Education and Skills, 2014a; p.3)

> *Learning for life: we want an education and training system that provides all learners with the knowledge and skills they need to participate fully in society and the economy, one that enables learners to learn how to learn.* (Ibid; p.4)

The Strategy recognises that the existence of a pedagogical orientation that supports an active use of technology by teachers and students in schools increases the likelihood of ICT being used effectively in teaching and learning. The Strategy will provide that any new and/or revised curricula, syllabi and teacher guidelines will include clear statements regarding why and how digital technology should be used in teaching and learning, particularly in relation to components of the literacy and numeracy strategy, and across all subjects and areas of learning.

PLANNING FOR THE EFFECTIVE USE OF ICT IN SCHOOLS

During the public consultation phase, many submissions acknowledged that schools need to plan for the effective use of ICT as part of their whole-school planning activities.

Currently, in planning how to use ICT in teaching, learning and assessment activities many schools use the *Planning and Implementing e-Learning in Your School Handbook* (NCTE, 2009)[26]. This includes the e-Learning Roadmap, a planning tool designed to help schools identify where they currently are in relation to e-Learning, and where they would like to go.

Feedback from schools indicates that this handbook is beneficial in helping schools to plan, but needs to be updated to complement the School Self-Evaluation (SSE) process[27]. SSE is a collaborative, reflective process of internal school review. It provides teachers with a means of systematically looking at how they teach and how pupils learn and helps schools and teachers to improve outcomes for learners. The handbook will guide schools into taking ownership of their own development and improvement.

DIGITAL LITERACY IN THE CURRICULUM

While the concept of 'ICT integration' is at the core of the Strategy, the concept of developing 'discrete' ICT skills also needs to be explored. Submissions called for the development of students' digital literacy by including coding and programming in the Irish primary and post-primary curriculum so that every learner has an opportunity to learn skills such as computational thinking, logic, critical thinking and strategic thinking to solve problems.

The term digital literacy is complex and often contested. The NCCA's short course on Digital Media Literacy[28] explains digital literacy as follows:

> *In studying digital media, students learn to use digital technology, communication tools and the internet to engage in self-directed enquiry. As students develop their digital literacy skills, they improve their capacity to know what they are looking for, what information to ignore or discard, and how to identify what can be useful or significant. They learn to discriminate between the multiple sources of information available online and to challenge the views they find there. They learn how to create, collaborate and communicate effectively and ethically. (Ibid, p. 6)*

[26] The e-Learning Handbook (http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/The-e-Learning-Handbook.html)
[27] School Self Evaluation (http://www.schoolself-evaluation.ie/)
[28] Digital Media Literacy Short Course (http://www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/Curriculum/Short%20Courses/Digital-Media-Literacy-Final.pdf)

Reflecting this understanding of digital literacy, there is a need to provide such progressive learning opportunities to students throughout their time in primary and post-primary school. One example is the development of Junior Cycle short courses which will provide post-primary schools with the opportunity to offer skills-focussed programmes to their students. The National Council for Curriculum and Assessment (NCCA) has already developed a Short Course in Coding[29], and one on Digital Media Literacy. The uptake and impact of these short courses will be evaluated by the NCCA and will inform future decisions on developments in this area. There will also be further opportunities for students to develop such skills at primary level.

The PDST Technology in Education (PDST-TiE), in collaboration with Lero, the Irish Software Research Centre, already provides continuing professional development (CPD) for teachers on Scratch[30] programming for teachers. Programmes, such as these, build the capacity of teachers to teach basic coding and programming to students.

In addition, to the work already underway by the NCCA, the strategy strongly supports the embedding of digital learning objectives within future education policy and curriculum initiatives; and a specific strategic action is set out in that regard. This will mean that future curriculum specifications can drive effective application of ICT in learning, and support teachers in developing students' digital learning competencies.

The Senior Cycle should build on students' previous experience of digital learning through the curriculum at primary level and in the Junior Cycle. Transition year also provides much scope for schools to enhance and deepen students' engagement with ICT and many schools exploit such opportunities very well. Learning in the Senior Cycle is underpinned by five key skills which are central to teaching and learning across the Senior Cycle curriculum. These are information processing, being personally effective, communicating, critical and creative thinking and working with others. ICT offers multiple opportunities to deepen students' engagement with these skills across the Senior Cycle curriculum. In addition, a number of Senior Cycle subjects including the technology subjects and music, for example, have specific components that require students to develop an in-depth knowledge of the application of ICT in those subjects.

Recognising the importance of progression to further and higher education, the Strategy will support the development of new opportunities for learners to undertake in-depth study of ICT in the Senior Cycle. Accordingly, as one of the priority actions of the Strategy, the NCCA will be requested to provide advice and options, to the Minister for Education and Skills, on further developing the provision for digital learning in the Senior Cycle. This will mean examining how best to provide for in-depth study of the application of ICT within and across subjects and how discrete ICT skills and competencies in computing can be developed as part of the Leaving Certificate. It is recognised that developing proposals for Senior Cycle will require careful attention to curriculum design options, teacher upskilling and resource issues. In that regard, the advice of the NCCA will be essential in providing workable proposals that will improve the digital learning opportunities for Senior Cycle students.

[29] Coding Short Course (http://www.curriculumonline.ie/getmedia/809c73d8-cd63-4852-ae4f-d1a24d4eccfd/11942-NCCA-JC-Short-Course-Coding-v3.pdf)
[30] Scratch – The Irish Software Research Centre (http://www.scratch.ie/)

ASSESSMENT REFORM

Globally there is a general move to reform how student learning is assessed across all levels of education using a range of assessment modes[31]. The concept of technology-supported assessment (Laborda, 2014) is a new, respected study domain and it is apparent that ICT is already playing a significant part in assessment reform.

Through ICT, schools now have access to a range of technologies that can be used for formative (developing student learning) as well as summative (evaluating student learning) assessment. Today, teachers and learners can access learner performance data in context by deploying simulations, digital games, virtual worlds, virtual labs and ePortfolios.

When used in this way, ICT has the potential to evaluate Key Skills, such as *Critical and Creative Thinking* and *Working with Others*, which are challenging to measure using traditional or computer-based tests.

Thus, ICT can help schools to gather information about students' learning from multiple sources and teachers can use this data to design more appropriate student learning activities. The Department has already explored the use of digital portfolios (ePortfolios) through the European funded EUfolio project (2013-2015)[32] and there is potential to extend their use for primary and post-primary students.

The Strategy acknowledges that computer-based assessment is becoming a core part of the Programme for International Student Assessment (PISA), a worldwide OECD study of academic performance in mathematics, science, and reading among 15-year-old students.

The assessment phase of PISA 2015 has been implemented in Ireland by the Educational Research Centre, on behalf of the Department. Irish students were assessed on their collaborative problem-solving skills, using computers. Also for the first time a parent/guardian questionnaire was administered, as well as science, reading and mathematics and students and principals completed digital, rather than paper versions of the background questionnaires (ERC, 2014[33]).

INCLUSION

ICT has the potential to support inclusion in a number of ways across the system by providing opportunities for students to learn outside the normal school setting or to enable learners with special educational needs to participate more fully in their education.

The Integrated Reform Delivery Plan, Education and Training Sector 2015 (Department of Education and Skills, 2014; p. 3)[34] states:

> *"We want an Education and Training system that welcomes and meaningfully includes learners with disabilities and special educational needs, learners from disadvantaged communities/backgrounds and those with language, cultural and social differences.*

The Framework for Junior Cycle has inclusive learning as one of its principles. It states "the educational experience is inclusive of all students and contributes to equality of opportunity, participation and outcomes for all".

[31] Strong Performers and Successful Reformers in Education: Lessons from PISA for the United States (http://www.oecd.org/edu/school/programmeforinternationalstudentassessmentpisa/strongperformersandsuccessfulreformersineducationlessonsfrompisafortheunitedstates.htm)
[32] EUfolio (http://www.eufolio.eu)
[33] Educational Research Centre PISA (http://www.erc.ie/?p=7)
[34] Integrated Reform Delivery Plan 2015 (https://www.education.ie/en/The-Department/Public-Service-Reform/Education-and-Training-Sector-Integrated-Reform-Delivery-Plan-IRDP-2015.pdf)

In adopting ICT for teaching and learning the Department will ensure that information will be accessible to all learners in line with requirements under the UN Convention on the Rights of Persons with Disabilities. The Convention emphasises;

- the obligation to 'provide accessible information to persons with disabilities' (Article.4);
- the need for 'the design, development, production and distribution of accessible ICT' (Article.9);
- the right to education 'without discrimination and on the basis of equal opportunity' for persons with disabilities (Article.24).

ICT has the potential to support learners, whose first language is not English, to enhance their oral and written literacy. In general, there is a recognition that digital technology has the potential to create a more inclusive education system for all learners.

ICT is a principal enabler for children at risk of educational disadvantage, with low levels of achievement in the formal education system. When it is appropriately embedded into an educational setting, ICT can enable students to learn in new and exciting ways, encouraging their engagement and making communication easier. Furthermore, there is evidence to indicate that the creative application of ICT in education can allow students at risk of early school leaving to connect with learning in new ways, resulting in improved motivation, attendance and application across subject areas.

The Strategy recognises that ICT has the potential to enable parents/guardians to become more actively involved in their children's learning by engaging in conversations with teachers and by accessing and commenting on students' work. ICT can also offer new learning possibilities by connecting with other schools.

DIGITAL CONTENT

The Strategy recognises that schools need to have access to a wide range of relevant, high-quality digital content, which serves to support learners at all stages of our education system.

The Strategy will continue to promote *Scoilnet* - Ireland's official education portal - and associated sites as the national reference point for schools for high-quality digital content and the *Arts in Education Portal*[35] as the national reference point for schools for a high standard of content supporting digital arts in education.

There is now an opportunity for teachers, students and parents/guardians to reduce reliance on textbooks and move in a planned way towards alternative forms of content that may include teacher or student-generated resources. In this context, schools can use the Book Grant Scheme to purchase a range of digital resources relevant to the curriculum. These may include student subscriptions to online maths or reading programmes, school site licences or app downloads.

PDST TECHNOLOGY IN EDUCATION

PDST Technology in Education (PDST-TiE) promotes and supports the integration of ICT in teaching and learning in schools. PDST-TiE is part of the national support service, the Professional

[35] Arts in Education (http://www.artsineducation.ie)

Development Service for Teachers, which operates under the aegis of the Department of Education and Skills. The functions of the PDST-TiE were previously the responsibility of the National Centre for Technology in Education (NCTE) which was integrated into the PDST in June 2012. The work of NCTE and now PDST-TiE in supporting ICT integration has evolved over the years and will continue to change.

PDST-TiE is one of the leading enablers to drive the Strategy by supporting schools to effectively integrate ICT into teaching, learning and assessment and providing advice and support to the Department on the implementation and impact of the Strategy.

THEME 1: TEACHING LEARNING AND ASSESSMENT USING ICT - OBJECTIVES AND ACTIONS

Objective	Action(s)	Timeframe	Lead Partner(s)
1.1. To embed digital learning objectives within future education policy and curriculum reform initiatives.	Include clear statements and objectives on the use of ICT, and the development of digital learning competencies, in future curriculum specifications and policy initiatives relating to learning and teaching.	2015-2020	NCCA, Curriculum and Assessment Policy Unit (DES)
1.2. To adapt the UNESCO ICT Competency Framework for Teachers for the Irish context.	- Establish a design team to review and adapt the UNESCO ICT Competency Framework for Teachers. - Pilot the adapted framework, and revise as appropriate, to ensure that it facilitates teachers to reflect on their practice and identify professional learning needs.	2016 2016-2017	ICT Policy Unit (DES) PDST-TiE
1.3. To aid the integration of ICT into teaching, learning and assessment in schools.	- Enable the PDST-TiE to play a lead role in promoting and supporting the integration of ICT in teaching and learning in schools. - PDST-TiE to help drive the implementation of the Strategy.	2015-2016 2015-2020	PDST-TiE
1.4. To ensure that schools can engage effectively in whole-school planning and self-evaluation to support provision for ICT learning.	- Update the 'e-Learning in Your School (NCTE, 2009)' planning resource so that it reflects technological and educational developments since 2009 including School Self-Evaluation procedures for schools. - Publish and disseminate the revised 'e-Learning in Your School' planning resource.	2016 2016	PDST-TiE PDST-TiE

Objective	Action(s)	Timeframe	Lead Partner(s)
1.5. To support personalisation and differentiation through the use of ICT.	- Provide case-studies and advice on how schools can best achieve personalised and differentiated learning for all learners using ICT. - Facilitate teachers to share exemplars of good practice in using digital tools.	2015-2020 2016-2020	PDST-TiE, Special Education Section (DES), Inclusion Support Service when established.
1.6. To provide opportunities for students to pursue in-depth ICT study in the Senior Cycle.	- NCCA to provide advice and options to the Minister on further developing the provision for digital learning in the Senior Cycle including the feasibility of providing an in-depth course of study in ICT as part of the Leaving Certificate.	2016-2018	NCCA, Curriculum and Assessment Policy Unit (DES), State Examinations Commission (SEC)
1.7. To promote technology-supported assessment.	- Explore and facilitate the use of ICT for formative and summative assessment purposes. - Promote the assessment of students' application of ICT in their learning across the curriculum.	2015-2020 2015-2020	NCCA, Curriculum & Assessment Policy Unit, (DES)
1.8. To promote the use of digital portfolios (ePortfolios) for primary and post-primary students.	- Build on the experience of the EUfolio project to promote the use of ePortfolios for primary and post-primary students.	2015-2020	PDST-TiE, NCCA, Curriculum & Assessment Policy Unit, (DES), NEPS
1.9. To ensure schools can use ICT as a tool for inclusive learning.	- Provide guidance and advice to schools on the use of ICT for teaching, learning and assessment for students with special education needs.	2015-2020	Special Education Section (DES), Inclusion Support Service
1.10. To support schools in their engagement with parents/ guardians with regard to the use of ICT to support teaching.	- Showcase how digital technologies can enhance communication between home and school. - Raise awareness on responsible and ethical use of the internet.	2015 - 2020 2015 - 2020	PDST-TiE PDST-TiE

Objective	Action(s)	Timeframe	Lead Partner(s)
1.11. Extend the scope and reach of students' learning beyond the walls of the classroom.	- Develop advice and support materials for schools on the possibilities of connecting with other schools and engaging in joint projects to offer new learning opportunities.	2015-2020	PDST-TiE
1.12. To resource digital content.	- Engage with publishers on the provision of digital content and services to support the curriculum including services appropriate for special education. - Raise awareness in schools of the facility under the book grant scheme to purchase a range of digital resources.	2016 2016	ICT Policy Unit (DES) Schools Division and ICT Policy Unit (DES)
1.13. To provide access to Open Educational Resources.	- Promote Scoilnet and associated sites/services as the national reference point for schools for high-quality digital content. - Enable schools, teachers and students to access quality-assured open digital content from educational content providers. - Develop strategic partnerships with relevant cultural, educational and sporting bodies in order to adapt relevant content into useful learning and teaching resources. - Develop and promote protocols on sharing of digital resources between providers of professional support for schools.	2015-2020 2016 2016 2016	PDST-TiE PDST-TiE Support Services PDST-TiE PDST-TiE

In addition to the lead partners, the following partners will play a central role in the actions required for the achievement of each objective:

PDST, JCT, ISS, NEPS, NIPT, Project Maths Development Team, State Examinations Commission (SEC), Teaching Council, ITE Providers, Education Centres, schools, teachers and students.

Support Services are established by the Department for the purpose of providing continuing professional development courses and other supports to teachers and schools. At the present time, support services include Professional Development Service for Teachers (PDST), Junior Cycle Team (JCT), National Induction Programme for Teachers (NIPT), Project Maths Development Team (PMDT), Special Education Support Service (SESS), and the National Behaviour Support Service (NBSS).

3. THEME 2: TEACHER PROFESSIONAL LEARNING

INTRODUCTION

Teacher professional learning featured prominently during the Strategy's research phase and in the *Census Report* findings. In that context, the Department understands the strategic need to support teachers in developing their professional practice, knowledge and skills so they can integrate ICT more effectively into their practice.

The Strategy notes that teachers have different knowledge and skill levels in relation to using ICT to design and develop effective learning experiences, and the level of knowledge and skills may change as teachers progress in their careers. The *Census Report* supports the idea that many teachers need to further build their knowledge and skills and develop greater confidence with ICT so that they can effectively integrate it into their practice.

This section features a number of main issues that emerged during the research and consultation phase, which feed into enhancing teacher professional learning over the lifetime of the Strategy. By addressing these issues, the Strategy will provide all teachers with a range of opportunities and supports to assist them to embed ICT into their practice.

GOAL: TEACHER PROFESSIONAL LEARNING – INDICATORS OF SUCCESS

- **Use of ICT for teaching, learning and assessment is embedded at each stage of the continuum of teacher education i.e. Initial Teacher Education, Induction and Continuous Professional Learning.**
- **Department and Teaching Council policies on teacher education recognise the role and potential of ICT to enhance teaching and learning.**
- **Department-funded support services and related bodies have embedded the use of ICT in CPD design, development and delivery.**
- **Guidance and examples of good practice on the effective, critical and ethical use of ICT for teaching, learning and assessment are provided to and shared by teachers.**

TEACHER KNOWLEDGE

Teachers require a wide range of knowledge in order to embed ICT effectively into their practice. The Technological Pedagogical and Content Framework[36], better known as TPACK, was developed by Mishra and Koehler (2006) to describe the levels of knowledge a teacher requires in order to integrate ICT into their professional practice. It describes the three types of knowledge required by a teacher for effective pedagogical practice in a technology enhanced learning environment (figure 4).

- Teachers need a mix of technological knowledge (TK) so they can use ICT effectively.
- Teachers need to have a deep knowledge of the curriculum content they are teaching (CK).
- Teachers require pedagogical knowledge in order to teach their subject area (PK).

[36] What is Technological Pedagogical Content Knowledge? (http://www.citejournal.org/articles/v9i1general1.pdf)

Equally important to the model are the interactions between these bodies of knowledge. When teachers effectively integrate these areas of knowledge, they can embed ICT effectively into their practice.

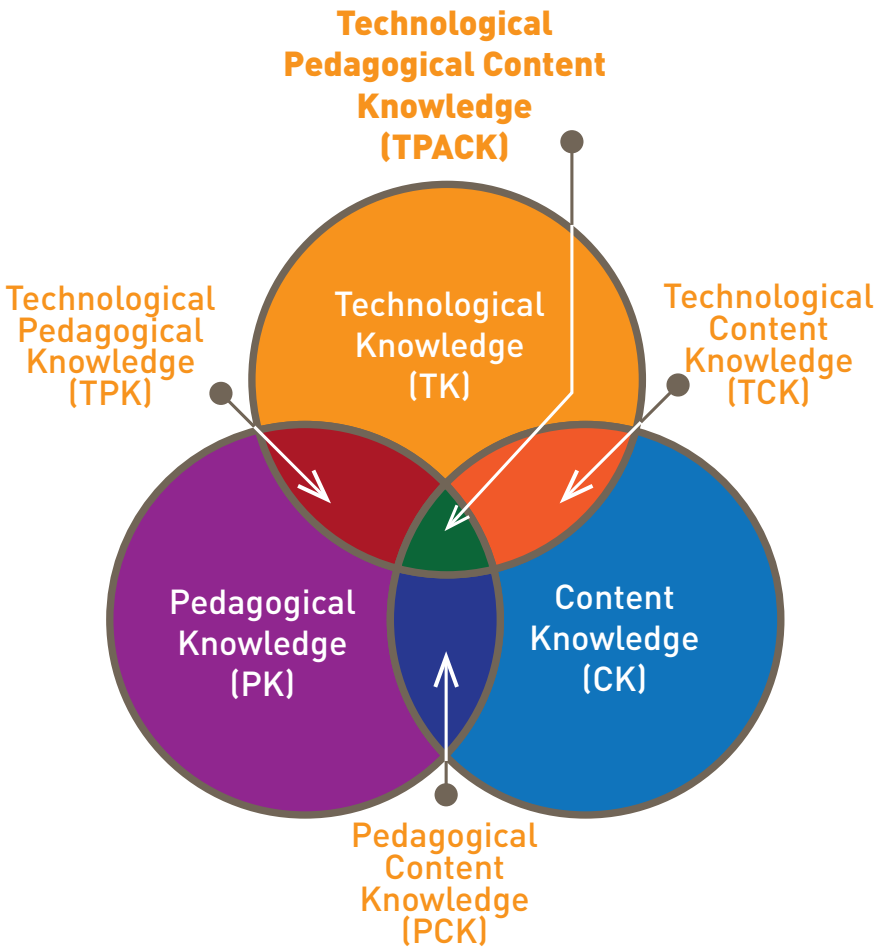


FIGURE 4. TPACK FRAMEWORK

Considering TPACK, this section will outline a number of key areas where the Department plans to support teachers to embed ICT more effectively in their professional practice over the five years of the Strategy.

TEACHERS' PROFESSIONAL LEARNING AND SCHOOL DEVELOPMENT

Many submissions made the case that ALL teachers should have the requisite knowledge and skills to integrate ICT effectively into their practice. Many commented that skills and knowledge need to be developed by teachers over time in supportive learning environments. Many respondents called for a new model of teacher professional learning that is more differentiated than is currently available and that caters for the variance of knowledge and skills within the profession in relation to using ICT.

They also called for the provision of teacher professional learning in a range of formats including; whole-school approaches, subject-department approaches, in-school professional learning sessions, out-of-school sessions, and online and blended learning workshops or courses.

The case was made that teachers should have a choice in terms of how they develop their professional practice knowledge and, where possible, ICT should support them in forming communities of practice, both online and offline. The majority of the submissions recommended that teacher professional learning needs to be rooted in classroom practice, such as the writing process and/or in enhancing Literacy/Numeracy practices.

Teachers and principals sought support on how they could use ICT alongside pedagogical practices that promote active student learning. Numerous submissions made the case that all forms of teacher professional learning should highlight a range of pedagogical practices that support the active use of ICT by learners in a range of settings. This is also recommended by the Inspectorate and by the OECD (2015).

The case was also made that there is a need to develop teachers' knowledge, skills and confidence to embed ICT more into their practice, particularly in courses developed as part of initial teacher education (ITE). It was noted in the submissions that the development of such professional practice knowledge should be an ongoing activity throughout a teacher's career.

CONTINUUM OF TEACHER EDUCATION

The Strategy acknowledges that to acquire the necessary ICT knowledge and skills, teachers will need to have access to professional development, on an ongoing basis, throughout their career. This is particularly pertinent in the area of ICT, where technology changes at a rapid pace. The Strategy notes that teachers can gather and record evidence, and reflect on ongoing learning throughout their career by collating this evidence in a teacher professional (paper or digital) portfolio.

In the main, the submissions ask that continuous professional development (CPD) accommodates the needs of the teacher and of school leadership (i.e. principals and deputy-principals) so that a wide variety of professional learning experiences are relevant and available.

Furthermore, the submissions note that particular groups, such as those working with learners with Special Education Needs (SEN), will require specialised CPD at regular intervals throughout their careers.

The *Census Report* found that teachers are seeking help to use ICT as a teaching and learning tool. Teachers report that they require assistance in a range of areas such as:

- using ICT to develop learner Key Skills;
- developing more advanced ICT skills (e.g. blogging, podcasting etc.);
- using ICT as a tool across the curriculum.

Many of these teachers also requested, where possible, to learn about ICT and ICT integration, while using their own school's technology/computers. The Inspectorate has suggested that the Strategy should promote blended forms of teacher CPD so that it includes a mix of face-to-face and online learning opportunities. The Inspectorate also recommends that planning for CPD should include the provision of a roadmap for further support and professional development from sources internal and external to the school.

The UNESCO ICT Competency Framework – explored in the previous section – can also play a strategic role in identifying teacher education needs. The framework can inform the content of future teacher professional learning provision along the Continuum of Teacher Education.

PROMOTING INNOVATIVE PRACTICE

Teachers and schools should have access to CPD which allows for the development of the specific competencies that are required for effective and innovative use of ICT in and for learning.

There should be opportunities for teachers and principals to experiment with the use of new devices and other digital tools with their learners and then to share their experiences across the profession. The learning from such experimentation can also be disseminated and discussed using communities of practice, either face-to-face or via social media. In this way, teachers can play a pivotal role in developing their own professional practice knowledge and that of the entire teaching community.

The Teaching Council promotes a culture of innovation, collaboration and professional leadership with teachers in a way that will maximise the impact of this for all teachers and learners. Events such as FÉILTE (Festival of Education in Learning and Teaching Excellence)[37], and programmes such as Droichead (pilot model for induction and probation)[38], and the development of the new website to support research, teaching and learning, Molfeasa[39], will continue to highlight the significant innovation that teachers are pioneering in the use of ICT.

The Digital Schools of Distinction[40] initiative, which is supported by the Department and by industry, is organised through the Dublin West Education Centre and aims to build capacity and recognise excellence in the use of technology at primary level. The initiative is also exploring how it can support whole-school engagement with ICT in post-primary schools. The new School Digital Champion initiative, which will be introduced as a pilot in 2015/2016, is led by the Department of Communications, Energy and Natural Resources (DCENR), with support from the Department, PDST and Education Centres. It aims to promote and elevate digital skills and competencies through student participation in digital projects, in turn benefitting the school and the wider community. Other initiatives such as the FÍS film project[41] and FÍS Book Club[42], managed by PDST-TiE and the Institute of Art Design and Technology (IADT), are capturing and sharing innovative practice. Initiatives like these provide a platform to showcase good practice and provide opportunities for teachers, young people and education leaders to share and explore new ideas.

[37] The Teaching Council Féilte Festival (http://www.teachingcouncil.ie/en/News-Events/FEILTE/)
[38] Droichead (http://www.teachingcouncil.ie/teacher-education/new-proposal-on-induction-and-probation.1593.html)
[39] Molfeasa (http://www.ncca.ie/en/Curriculum_and_Assessment/Partnerships/)
[40] Digital Schools of Distinction (http://www.digitalschools.ie/)
[41] FÍS Film Project (http://www.fisfilmproject.ie/)
[42] FÍS Book Club (http://login.fisbookclub.ie/)

THEME 2: TEACHER PROFESSIONAL LEARNING - OBJECTIVES AND ACTIONS

Objective	Action(s)	Timeframe	Lead Partner(s)
2.1 To embed digital technology across the continuum of teacher education and other Departmental-supported teacher education programmes.	- Ensure that ICT is embedded in the planning, design and delivery of all teacher education courses and programmes. - Ensure that all professional development support services collaborate on the planning, design and delivery of CPD modules to support teachers to embed ICT in their practice across the curriculum.	2015-2016 2015-2016	PDST –TIE Teaching Council Teacher Education Providers Support Services
2.2 To embed ICT in Initial Teacher Education Programmes.	- Cooperate with initial teacher education providers to ensure that pre-service teachers acquire the skills, knowledge and confidence to use digital technologies to support learning and teaching.	2016-2020	ICT Policy Unit, (DES) and ITEs
2.3 To embed the use of ICT in all induction programmes for teachers.	- Cooperate with NIPT so that Newly Qualified Teachers (NQTs) receive appropriate guidance and support to integrate ICT into teaching, learning and assessment.	2015-2020	NIPT
2.4 To align teachers' professional learning in ICT to the Teaching Council's National Framework for CPD.	- Map all teacher CPD involving the use of ICT in learning and teaching to the Teaching Council's national framework for CPD when available.	2015-2020	ICT Policy Unit, (DES), Support Services

Objective	Action(s)	Timeframe	Lead Partner(s)
2.5 To provide a flexible, differentiated model of CPD to support embedding of ICT in teaching, learning and assessment.	- Develop and promote differentiated CPD models to embed ICT in teaching, learning and assessment. - Enhance the access to and impact of CPD for teachers through extending CPD delivery formats to include online and blended learning programmes. - Facilitate school-based, individual and whole-staff professional learning through online and blended learning support packages.	2015-2020 2015-2020 2015-2020	PDST-TIE, Support Services Support Services PDST-TIE, Support Services
2.6 To provide information to teachers on innovative ways to use digital technology more actively in their own teaching.	- Promote the sharing of examples of good practice among teachers so that they can design more active learning activities for their students using ICT. - Provide advice and guidance to teachers on new technologies relevant to teaching, learning and assessment.	2015-2020 2015-2020	Support Services
2.7 To develop and promote examples of effective integration of ICT in teaching, learning and assessment.	- Provide and facilitate the sharing of examples of good classroom practice on the effective use of ICT in teaching, learning and assessment. - Support the capacity building objectives of the Digital Schools of Distinction initiative as part of the Digital Strategy. - Introduce and implement the School Digital Champion initiative (introduce as a pilot in 2015/2016).	2015-2020 2015-2016 2015-2016	Support Services PDST DCENR

Objective	Action(s)	Timeframe	Lead Partner(s)
2.8 To provide continued support to schools on the use of ICT for students with special educational needs.	- Provide continued support for teachers and principals in the use of digital learning tools for students with additional learning needs. - Develop and share case studies on the effective use of ICT in special educational needs settings.	2015-2020 2016-2017	Special Education (DES), Inclusion Support Service (when established), NEPS
2.9 To encourage and support the use of ePortfolios for teachers.	- Collaborate with the Teaching Council, and other relevant professional bodies for teachers, in the use of ePortfolios in teacher CPD provision.	2018-2020	Teaching Council and PDST-TIE
2.10 To promote Professional Communities of Practice.	- Provide advice and guidance on digital tools to support teacher professional communities of practice within schools or other teacher networks. - Provide advice to communities of practice on the sharing of digital resources and practices.	2015-2020 2016-2020	Support Services PDST-TiE, Support Services

In addition to the lead partners, the following partners will play a central role in the actions required for the achievement of each objective:

PDST, JCT, ISS, NEPS, NIPT, Project Maths Development Team, Teaching Council, ITE Providers, Education Centres, schools, teachers and students.

4. THEME 3: LEADERSHIP, RESEARCH AND POLICY

INTRODUCTION

There is a need for strong leadership at all levels of the education system in order to ensure the successful implementation of the Strategy. The Department and its agencies will play a principal role in supporting schools and other organisations to effectively integrate ICT into teaching, learning and assessment.

The education system will need to plan in order to achieve ICT integration and this will be an ongoing process requiring regular reviews. A significant part of this process will be to implement a system of research and evaluation in order to provide regular data on how effectively integration is being achieved. In addition to conducting formal research, the Strategy will encourage teachers to reflect on their own professional practice in using ICT, and to share their thoughts with their colleagues, both face-to-face and online.

In this section, a number of priorities are highlighted relating to leadership, research and policy which emerged during the consultation and research phase. The key actions that need to be carried out in order to address these priorities are also outlined.

GOAL: LEADERSHIP, RESEARCH AND POLICY – INDICATORS OF SUCCESS

- **The role and potential of ICT to enhance teaching, learning and assessment recognised in the policies and programmes of the Department, its agencies and funded bodies.**
- **Structures are established to provide oversight of and guidance on the implementation of the Strategy.**
- **Guidance, planning resources and related supports for the effective, safe and ethical use of ICT are available to school leaders and teachers.**
- **Appropriate linkages developed with other school policies and external initiatives, to support the embedding of ICT in teaching, learning and assessment, for example, School Self-Evaluation, external inspection and research.**

LEADERSHIP AND POLICY

The ICT Policy Unit will assist relevant sections of the Department, including agencies under its remit, to play an active role in implementing the Digital Strategy for Schools. Ensuring that the use of ICT is embedded at all stages of the continuum of teacher education is the responsibility of all sections of the Department and this also extends to its relevant associated agencies and support services. In addition, the Department will support school leaders to integrate ICT into teaching, learning and assessment activities at school level. This will be a challenging task and it will require all education partners to work together to achieve meaningful integration.

EVALUATION

Evaluation should form a crucial component of the new Strategy. There is a need to monitor implementation of the Strategy and to ensure that the system is making progress towards achieving ICT integration in Irish schools. Ongoing evaluation of ICT integration is an important element in improving practice and outcomes in this area. This is relevant to both external evaluations that are conducted by the Department's Inspectorate and internal evaluation activities that are conducted as part of schools' commitment to self-evaluation.

Published reports of school evaluations conducted by the Department's Inspectorate frequently include evaluative comments and recommendations regarding the use of ICT in teaching and learning. This will continue to be the case. It is envisaged also that the Inspectorate will collect data regarding the implementation of the Strategy once schools have had sufficient time to make progress on relevant actions in the 2016/2017 school year.

The Inspectorate supports the School Self-Evaluation (SSE) process[43] through the publication of guidelines and resources in printed format and on the web and through advisory visits to schools.

The evaluation criteria provided to support school self-evaluation include criteria relating to the provision and use of ICT in teaching and learning. Evaluation and improvement in the use of ICT in teaching and learning should therefore be an ongoing part of school self-evaluation activity as it is relevant to literacy, numeracy or any other area that a school may have prioritised for evaluation and improvement in a given year.

RESEARCH

The concept of teachers as reflective practitioners was captured in multiple submissions during the public consultation phase of the Strategy, and it was suggested that the Strategy should support teacher-led research on the use of digital technology in teaching, learning and assessment.

The submissions suggested there is a need for experimentation and reflection in relation to how ICT can be integrated into teaching, learning and assessment activities. This would allow teachers to reflect on their practice and to share it with colleagues, thus creating a database of teacher-developed case studies. Other submissions also suggested collating and sharing existing teacher research (i.e. Masters and Doctoral research in the field of ICT) to the wider education system. Such actions have the potential to develop a collection of evidence relevant to Irish teachers that could be shared with colleagues through projects such as Molfeasa[44].

The *Census Report* also makes the case for rigorous research-based approaches to implementing publicly-funded initiatives, so the Department can trial new technologies and approaches in schools. Such initiatives should examine the effects of innovative practice, particularly in relation to developing teacher knowledge and teacher professional learning. It suggests that there is a value in conducting pilot studies prior to full-scale implementation of new initiatives, so that potential implementation gaps can be identified and addressed at an early stage.

Options such as the Department seeking resources, primarily through EU funding, to enable the

[43] School Self-Evaluation (http://www.schoolself-evaluation.ie)
[44] Molfeasa (http://www.ncca.ie/en/Curriculum_and_Assessment/Partnerships)

system to engage in innovative and evidence-based research programmes that meet ICT policy priorities will be considered. The Department has already taken the initiative to investigate and experiment with the use of ICT in areas such as assessment by leading the EUfolio Project[45] and it is anticipated that such initiatives will be expanded during the lifetime of the strategy.

Engagement with the Irish third-level sector, further education and the international academic community, can also improve our collective understanding about how best to embed ICT in education. The Strategy will seek to support colleges of education and other organisations such as the Department-funded support services to conduct relevant research that will assist in furthering our understanding of this complex area. The adoption of such an evidence-led approach to ICT integration will assist the Department in implementing informed policy decisions that will ultimately improve our overall education system.

ETHICAL AND SAFE USE OF THE INTERNET AND RELATED TECHNOLOGIES

Multiple submissions, particularly from parents/guardians and young people, commented on the issue of safe, critical and ethical use of the internet and it was reported that some schools have not engaged in using the internet because of concerns over issues such as internet safety. This was further supported by recent research from the OECD (2015) and the Strategy recognises the importance of providing relevant advice to schools in this area.

Central to promoting the autonomous, effective, and safer use of the internet by young people is a strong commitment to changing behaviour through a sustained information and awareness strategy targeting parents, teachers, and children and young people themselves. Homes and schools play a crucial role in promoting good practice in preventing and coping with inappropriate use of the internet. It is important that schools constantly review their policies and procedures regarding acceptable internet use, internet safety, digital identity and data protection in the context of their whole-school policies and planning. The issues involved in allowing learners to use their own personal digital devices in teaching and learning will require further exploration and evaluation.

[45] EUfolio (http://www.eufolio.eu)

THEME 3: LEADERSHIP, RESEARCH AND POLICY - OBJECTIVES AND ACTIONS

Objective	Action(s)	Timeframe	Lead Partner(s)
3.1 To provide strong leadership within the Department to oversee and regularly review the Strategy.	- Establish an Implementation Group consisting of representatives from relevant sections within the Department and the support services and agencies. - Provide regular reports on progress towards the achievement of the goals and objectives of the Strategy.	2015-2020 2015-2020	DES ICT Policy Unit
3.2 To ensure coherence and continuity between digital strategies for the school sector and the higher and further education sectors.	- Ensure regular engagement between the Implementation Group and project leaders of complementary digital learning initiatives in Further and Higher Education.	2015-2020	ICT Policy Unit Further Education Section Higher Education Section
3.3 To enhance ICT capacity and awareness in the education system in partnership with industry.	- Engage with representative bodies of industry to develop a framework to assist schools to work with industry in line with the recommendations of the ICT Skills Action Plan 2014-2018.	2015-2017	Curriculum and Assessment Policy Unit, (DES)
3.4 To encourage a culture of innovation.	- Continue to participate in Relevant, strategic ICT projects at EU level. - Seek to target and coordinate support for innovative ICT projects in schools.	2015-2020 2015-2020	*ICT Policy Unit (DES) and* PDST-TIE

Objective	Action(s)	Timeframe	Lead Partner(s)
3.5 To promote responsible and ethical use of the internet and related technologies.	- Undertake awareness-raising actions and programmes that promote responsible and ethical use of the internet in close cooperation with all relevant actors at European, regional and local levels.	2015-2020	PDST-TIE
	- Provide parents/guardians, students and teachers with information, advice and tools to promote safer, more responsible and more effective use of the internet.	2015-2020	PDST-TIE
	- Develop additional learning resources for teachers to integrate cyber-bullying awareness and prevention into each school's provision for Wellbeing including its curriculum programme for Social, Personal and Health, Education (SPHE).	2015-2020	PDST/PDST-TIE
3.6 To evaluate ICT integration at school level.	- Provide schools with tools to enable school self-evaluation and monitoring of the integration of ICT into learning and teaching.	2015-2016	ICT Policy Unit and Inspectorate (DES)
	- Conduct external thematic evaluations of ICT integration in schools.	2017-2020	
In addition to the lead partners, the following partners will play a central role in the actions required for the achievement of each objective: *PDST, JCT, ISS, NEPS, NIPT, Project Maths Development Team, Teaching Council, ITE Providers, Education Centres, schools, teachers and students.*			

5. THEME 4: ICT INFRASTRUCTURE

INTRODUCTION

Referring to ICT integration, the *Census Report* states that, "infrastructure includes resources such as computer hardware, data and networks, information resources, interoperable software and technical support" (Cosgrove et al., 2013b; p. 37). The Strategy recognises that schools require a robust, reliable ICT infrastructure in order to effectively integrate ICT into all aspects of school life.

In this section, a number of major infrastructural issues are considered and the actions required to enhance the existing ICT infrastructure in schools are outlined. The purpose is to ensure that the specific goals will enable students and teachers to have access to reliable ICT infrastructure in schools.

GOAL: ICT INFRASTRUCTURE – INDICATORS OF SUCCESS

- **Improved connectivity for primary schools.**
- **Grants scheme introduced for the purchase of equipment by schools.**
- **Guidance and advice provided for the purchase of equipment and services.**
- **Guidance published on the innovative use of ICT for teaching and learning.**

SCHOOLS BROADBAND

Over recent years, government investment in national ICT infrastructure has been prioritised. Specific prioritisation has been given to a programme to provide 100 Mbit/sec broadband to all post-primary schools and a small number of special schools with post-primary students.

This programme is jointly funded by the Department of Education and Skills and the Department of Communications, Energy and Natural Resources (DCENR) with DCENR funding the capital costs, as well as contributing to the current cost (of the year after installation) for the years 2012 to 2015. The Department funds all other current costs for those years and the on-going costs (capital and current) on an annual basis thereafter.

Primary schools' broadband services are delivered through a number of Broadband Access Providers. Improved connectivity for primary schools specifically is a priority under the Strategy. The Department continues to seek improved broadband connections using a number of different technologies in order to ensure that all schools are connected, regardless of location. The particular technology used to connect a specific school depends on a number of factors including location, and the broadband connectivity options available locally.

The Department will also collaborate with DCENR to bring enhanced broadband to Irish primary schools during the lifetime of the Strategy. The Government's National Broadband Plan[46] commits to a State-funded initiative to deliver high speed broadband to those parts of Ireland where commercial high speed broadband services are not available. The intervention is designed to

[46] National Broadband Plan (http://www.dcenr.gov.ie/communications/en-ie/Broadband/Pages/National-Broadband-Plan.aspx)

conclusively address connectivity issues in Ireland. There are over 1,500 schools in the target area for the intervention, most of which are primary schools. The Government has been consulting on the intervention strategy under the National Broadband Plan, and this includes the enablement of connections to all schools within the intervention area. This programme will help to provide more cost-effective, high-speed connectivity to rural primary schools that currently cannot access reliable broadband. The Government aims to proceed to the formal procurement phase of the Strategy by the end of 2015.

IN-SCHOOL WIRELESS NETWORKS

The rollout of wireless networks or Wi-fi within schools is a key government priority. Improved Wi-fi access would provide new opportunities to increase access to online resources for learning throughout a school, which in turn would facilitate anytime, anywhere learning. High quality in-school Wi-fi is also required as the number of computing devices continues to increase in schools. Schools require scalable, robust Wi-fi solutions. The Department recognises that schools require expert advice in selecting fit-for-purpose and future-proof systems.

ICT EQUIPMENT

There is a need to invest in digital devices in schools. The *Census Report* states, "the Strategy should address the issue of ageing computing devices" (Ibid; p.38). It also found that currently teachers have relatively good access to computers but that learners are poorly resourced. The *Census Report* suggests that this lack of access by students to digital devices could contribute to "didactic as opposed to constructivist hands-on teaching and learning activities" (Ibid; p.38).

It was also identified during the research phase for the Strategy that many teachers would like access to a computing device "as part of their professional toolkit". Many schools have already facilitated access to laptops or tablet devices for teachers so as to enable them to plan, develop resources and assign and collect homework.

ONE-TO-ONE STUDENT DEVICES/BRING YOUR OWN DEVICE (BYOD)

An increasing number of schools have initiated 1:1 programmes where every student in a particular year has access to a laptop or tablet device, while many more schools are actively considering it in the near future.

The Association for Community and Comprehensive Schools (ACCS) Report (2013)[47] found that schools with tablet programmes were in the initial stages of implementation and that they often underestimated the significant amount of work such programmes entailed. The levels of learning content and resources that had to be provided to students and the necessary extension of robust wireless services around the school were two particular issues which were found to be underestimated. Despite the challenges, schools reported positive outcomes, including an increased enthusiasm among students, higher levels of independent learning, and increased communication and collaboration among students.

Schools require advice on implementing such strategies to ensure that the school community and infrastructure are equipped to support the initiative.

[47] Use of Tablet Devices in ACCS Schools (http://www.accs.ie/cmsAdmin/uploads/accs_report_final_one_to_one_devices.pdf)

CLOUD SERVICES

This Strategy recognises that the cloud computing ecosystem is transforming how many schools operate. There are new opportunities for teachers, learners, parents/guardians and other organisations to interact with one another to ultimately support learning. The growth in cloud services is enabling schools to provide email and file storage space to teachers and learners. It is allowing them to collaborate and communicate more easily using a range of cost-effective applications and technologies.

The integration of cloud services, underpinned by fast reliable broadband, has the potential to enhance linkages between home and school and facilitate internet access "anytime, anywhere" for teaching, learning and assessment resources and activities. The Strategy recognises that cloud services will continue to expand and that the effective use of these services has the potential to transform teaching, learning and assessment activities in schools. However, data security and privacy issues must be considered when using cloud services and schools need greater support in this area.

TECHNICAL SUPPORT AND MAINTENANCE

Schools require external technical support in relation to their ICT equipment, infrastructure and systems so that they can support teaching, learning and assessment as well as the school's administration and planning systems. The issue of technical support cannot be considered as an isolated issue and should be considered as part of each school's eLearning plan.

During the formulation of the Strategy, schools identified the challenge of attaining reliable and timely technical support as a major issue. In addition, schools have very diverse needs in terms of technical support, requiring providers to have a high level of technical knowledge and expertise that is relevant to different school settings or contexts.

There is no international consensus on any one model of best practice for technical support provision. Models of technical support include specific ICT related grants, the provision of regional technical support services including technicians (either in school or shared between schools), and provision of fully managed technical support services (remotely or onsite). A centralised national system of support is not viable and would not meet schools' needs because the variation in school location, size and ICT infrastructure makes such provision impractical. The issue of providing technical support to all schools is complex and requires further consideration. The Strategy will evaluate a number of technical support options with a view to providing guidance on the best technical support solutions for schools.

PURCHASING AND PROCUREMENT

The *Census Report* highlights the need to have national arrangements in place for the purchase and supply of school-ready ICT equipment and develop a national plan for equipment renewal and avoiding equipment obsolescence.

As part of the Department Reform Initiative the Schools Procurement Unit (SPU) was set up under the Shared Services Plan 2014-2016. It is hosted by the Joint Managerial Body (JMB) and seeks

to support all schools in procurement matters. The SPU helps schools to access centralised frameworks, in line with the Government's policy on the need to ensure that public sector bodies secure best value for money in legally compliant procurement activity. The SPU will also look to represent the interests of the school sector back to the Government buyers within the centralised procurement model. The Office of Government Procurement (OGP) will continue to provide frameworks for the purchase of equipment such as printers, desktop PCs, and notebooks.

The Department will work with the OGP to ensure that existing procurement frameworks will be developed and/or reviewed and new frameworks will be developed to cover the ever-changing range of ICT equipment and services being considered by schools. These frameworks provide schools with the advantages of bulk-purchasing and help schools to make better decisions in terms of equipment specification and total cost of ownership.

THEME 4: ICT INFRASTRUCTURE - OBJECTIVES AND ACTIONS

Objective	Action(s)	Timeframe	Lead Partner(s)
4.1 To provide funding for School ICT Infrastructure.	- Provide multi-annual grants for ICT infrastructure in line with availability of public funds.	2015-2020	ICT Policy Unit, (DES)
4.2 To improve Internet Connectivity for schools.	- Continue to improve broadband connections in primary schools under the existing Schools Broadband Programme. - Collaborate with DCENR to provide enhanced broadband services to primary schools. - Continue to provide high speed (100m/bits) to post- primary schools.	2015-2020 2016-2020 2015-2020	ICT Policy Unit (DES), DCENR
4.3 To support the creation of school networks including Wi-Fi.	- Provide and review as necessary wireless networks at new-build stage (new school building and extension projects). - Publish technical guidance documents for schools for the provision of wireless network installation. - Establish a procurement framework for Wireless providers. - Provide advice in relation to wired networks.	2015-2020 2015-2016 2015-2016	Planning & Building Unit (DES) ICT Policy Unit, Planning & Building Unit (DES) ICT Policy Unit, Planning & Building Unit (DES)

Objective	Action(s)	Timeframe	Lead Partner(s)
4.4 To provide advice on ICT equipment and BYOD.	- Provide advice on ICT equipment and digital learning tools that are best-suited to support learning and teaching in schools. - Develop guidance for schools that wish to develop BYOD (Bring Your Own Device) approaches and exploit other emerging technologies. These will be supported by best practice videos, case-studies and advice on devices and pedagogical approaches.	2015-2020 2015-2017	*PDST-TiE* *PDST-TiE*
4.5 To provide advice and support to schools on cloud services for education.	- Explore the potential of cloud-based services across primary and post-primary schools. - Develop advice for schools on the use of cloud-based services including guidance on data security and privacy.	2016-2018 2015-2016	PDST-TiE PDST-TiE
4.6 To explore and recommend technical support solutions for Schools.	- Evaluate a number of technical support options. - Provide guidance on the best technical support solutions for schools.	2016-2017 2016-2020	ICT Policy Unit, (DES)
4.7 Ensure clear and concise advice is available to schools in relation to procurement.	- Work with OGP to ensure that the needs of schools are considered when existing or new frameworks are put in place for ICT equipment and services. - Work with the Schools Procurement Unit and ETBs to ensure that schools are aware of the frameworks that are in place. - Provide advice to schools in relation to their requirements under public procurement and the benefits and opportunities available.	2015-2020 2015-2020 2015-2020	ICT Policy Unit (DES) and Schools Procurement Unit and ETBs
In addition to the Lead Partners, the following Partners will play a central role in the actions required for the achievement of each objective: *PDST, JCT, ISS, NEPS, NIPT, Project Maths Development Team, Teaching Council, ITE Providers, Education Centres, HEAnet, Office of Government Procurement, the Schools Procurement Unit, Education and Training Boards (ETBs), schools, teachers and students.*			

6. ENSURING EFFECTIVE IMPLEMENTATION

STRATEGY TIMELINE

The Strategy sets out a comprehensive set of actions to be achieved from 2015 to 2020. Each of the deliverables in the Strategy has a timeline and clear lead responsibility for delivery. These actions will be prioritised in line with available exchequer funding and system capacity.

Over time, it will bring significant changes to areas such as teachers' professional development, the way in which the curriculum in primary and post-primary schools is delivered, the way ICT is used for assessment, and how schools communicate with parents/guardians and the outside world.

ROLE OF THE DEPARTMENT OF EDUCATION AND SKILLS IN ICT IMPLEMENTATION

The Department recognises the potential of ICT to transform teaching, learning and assessment practices in our schools and will continue to provide leadership across the education system. The Department will play an enabler role in leading and facilitating schools and teachers to adopt new pedagogies so they can better engage their students in using ICT to create a quality learning environment in a coherent way.

The implementation of the Strategy will be led and coordinated by the ICT Policy Unit in the Department. In addition, the Unit will report regularly to Senior Management and the Minister on progress in implementing the Strategy. To assist the Unit, a group will be established to oversee this work. This group will include relevant senior officials from the Department, as well as representatives of the agencies that are responsible for implementation of the strategy deliverables. The group will:

- draw on specialist advice from national and international experts;
- draw up and regularly update an implementation plan covering actions contained in the Digital Strategy for Schools;
- monitor progress towards achieving the targets in the strategy and the goals set out in the implementation plan and report to the Minister at least once annually;
- consult regularly with the education partners and other relevant interests regarding the implementation and development of the Strategy through meetings, conferences and other means;
- advise the Minister on the efficiency of the actions being taken to achieve the targets and suggest improvements and changes to the actions and the targets as necessary in the light of experience;
- produce reports for dissemination; and
- develop and implement a communication plan for the Strategy.

TRANSFORMING LEARNING IN SCHOOLS

This Strategy sets out how we will work to realise the potential of ICT to transform the learning experiences of students by helping them become engaged, creative and critical thinkers, global citizens, and active and self-determined resilient learners in collaborative social-learning environments.

SELECTED BIBLIOGRAPHY

21st Century Learning Reference Group (2014). "Future-focused learning in connected communities." Retrieved September, 2015, from http://www.education.govt.nz/assets/Documents/Ministry/Initiatives/FutureFocusedLearning30May2014.pdf

Baskin, C. and M. Williams (2006). "ICT integration in schools: Where are we now and what comes next?" Australasian Journal of Educational Technology & Society 22(4): 455-473.

Blurton, C. (1999). "New Directions of ICT-Use in Education." Retrieved September, 2015, from http://www.unesco.org/education/lwf/dl/edict.pdf.

Butler, D., et al. (2013). "A Consultative Paper Building Towards a Learning Society: A National Digital Strategy for Schools." Retrieved September, 2015, from http://www.education.ie/en/Schools-Colleges/Information/Information-Communications-Technology-ICT-in-Schools/Digital-Strategy-for-Schools/Building-Towards-a-Learning-Society-A-National-Digital-Strategy-for-Schools-Consultative-Paper.pdf.

Centre for Educational Research and Innovation (CERI) (2010). "Inspired by Technology, Driven by Pedagogy: A Systemic Approach to Technology-Based School Innovations." Retrieved September, 2015, from http://www.oecd.org/edu/ceri/inspiredbytechnologydrivenbypedagogyasystemicapproachtotechnology-basedschoolinnovations.htm

Cosgrove, J., et al. (2013a). "The 2013 ICT Census in Schools - Main Report". Retrieved September, 2015, from www.erc.ie/documents/ict_census2013_mainreport.pdf.

Cosgrove, J., et al. (2013b). "The 2013 ICT Census in Schools - Summary Report". Retrieved September, 2015, from www.erc.ie/documents/ict_census2013_summaryreport.pdf.

Cosgrove, J., et al. (2013c). "The 2013 ICT Census in Schools - Appendices". Retrieved September, 2015, from www.erc.ie/documents/ict_census2013_appendices.pdf.

Department of Communications Energy and Natural Resources (2013). "Doing more with Digital - National Digital Strategy for Ireland Phase 1: Digital Engagement." Retrieved September, 2015, from http://www.dcenr.gov.ie/communications/en-ie/Pages/Publication/Doing-More-with-Digital-National-Digital-Strategy-for-Ireland.aspx

Department of Education (1997). "Schools IT2000: A Policy Framework for the New Millennium." Retrieved September, 2015, from http://www.education.ie/en/Publications/Policy-Reports/Schools-IT2000.pdf.

Department of Education and Skills (2012). "Chief Inspector's Report 2010 -2012." Retrieved September, 2015, from http://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/Chief-Inspector's-Report-2010-2012-Main-Report.pdf

Department of Education and Science (2008). "ICT in Schools: Inspectorate Evaluation Studies." Retrieved September, 2015, from http://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/ICT-in-Schools-Inspectorate-Evaluation-Studies.pdf.

Department of Education and Science (2008). "Investigating Effectively in ICT in Schools, 2008-2013: The Report of the Minister's Strategy Group." Retrieved September, 2015, from https://www.education.ie/en/Publications/Policy-Reports/Investing-Effectively-in-Information-and-Communication-Technology-in-Schools-2008-2013.pdf

Department of Education and Skills (2014). "Integrated Reform Delivery Plan Education and Training Sector 2015." Retrieved September, 2015, from http://www.education.ie/en/The-Department/Public-Service-Reform/Education-and-Training-Sector-Integrated-Reform-Delivery-Plan-2014-2016.pdf

Department of Education and Skills and Department of Jobs Enterprise and Innovation (2014). "ICT Skills Action Plan: Government, Education and Industry working together to make Ireland a global leader in ICT talent 2014-2018." Retrieved September, 2015, from http://www.education.ie/en/Publications/Policy-Reports/ICT-Skills-Action-Plan-2014-2018.pdf

Educational Research Centre (ERC) (2015). "PISA (The Programme for International Student Assessment)." Retrieved September, 2015, from http://www.erc.ie/?p=7.

Hislop, H. (2013). "Current policy trends and issues in teacher education and curricular reform." Retrieved September, 2015, from http://www.education.ie/en/Press-Events/Speeches/2013-Speeches/SP13-02-22.html.

ICT Ireland and Department of Education and Science (2009). "Smart Schools = Smart Economy: Joint Advisory Group to the Minister for Education and Science." from https://www.education.ie/en/Publications/Policy-Reports/Smart-Schools=Smart-Economy.pdf

Jamieson-Proctor, R. M., et al. (2006). "ICT integration and teachers' confidence in using ICT for teaching and learning in Queensland state schools." Australasian Journal of Educational Technology & Society 22(4): 511-530.

Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2015). " NMC Horizon Report: 2015 K-12 Edition." Retrieved September, 2015, from http://www.nmc.org/publication/nmc-horizon-report-2015-k-12-edition.

Kozma, R. (2008, April). "ICT, Education Reform, and Economic Growth: A Conceptual Framework." Retrieved September, 2015, from http://download.intel.com/education/EvidenceOfImpact/Kozma_ICT_Framework.pdf

LIM, C. P. and M. S. KHINE (2006). "Managing Teachers' Barriers to ICT Integration in Singapore Schools." Journal of Technology and Teacher Education 14(1): 97-125.

Lloyd, M. (2005). Towards a definition of the integration of ICT in the classroom. AARE 2005 Education Research - Creative Dissent: Constructive Solutions, Parramatta, New South Wales.

Looney, J. and A. Michel (2014). "KeyConet's Conclusions and Recommendations for Strengthening Key Competence Development in Policy and Practice." Retrieved September, 2015, from http://keyconet.eun.org/c/document_library/get_file?uuid=b8134225-28dd-4734-961b-416fddd19e66&groupId=11028.

McGinn, A. (2007). "Senior High School Education in the 21st Century." The Educational Forum 71(4): 331-344.

National Centre for Technology in Education (NCTE) (2009). "Planning and Implementing e-Learning in your school: Handbook for principals and ICT Co-ordinating Teachers." Retrieved September, 2015, from http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/The-e-Learning-Handbook.html.

National Council for Curriculum and Assessment (NCCA) (2013). "Digital Media Literacy Draft specification for Junior Cycle Short Course." Retrieved September, 2015, from www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/Consultation/Short%20Courses/SC_DML.pdf

National Council for Curriculum and Assessment (NCCA) (2013). "Programming and Coding: Draft Specification for Junior Cycle Short Course." Retrieved September, 2015, from www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/Consultation/Short%20Courses/SC_P_and_C.pdf

OECD (2015). "Students, Computers and Learning Making the Connection." Retrieved September, 2015, from http://dx.doi.org/10.1787/9789264239555-en.

Qablan, A. M., et al. (2009). "Effective Integration of ICT in Jordanian Schools: An Analysis of Pedagogical and Contextual Impediments in the Science Classroom." Journal of Science Education Technology 18: 291–300.

Tondeur, J., et al. (2010). "From ICT coordination to ICT integration: a longitudinal case study." Journal of Computer Assisted Learning 26(4): 296-306.

Tondeur, J., et al. (2008). "ICT integration in the classroom: Challenging the potential of a school policy." Computers and Education 51: 212-223.

UNESCO (2008). "ICT Competency Framework for Teachers: Implementation Guidelines Version 1." Retrieved September, 2015, from http://unesdoc.unesco.org/images/0015/001562/156209E.pdf.

UNESCO (2008a). "ICT Competency Standards for Teachers: Competency Standard Modules." Retrieved September, 2015, from http://unesdoc.unesco.org/images/0015/001562/156207e.pdf.

UNESCO (2011). "UNESCO ICT Competency Framework for Teachers Version 2.0." Retrieved September, 2015, from http://unesdoc.unesco.org/images/0021/002134/213475E.pdf.

Wang, Q. and H. L. Woo (2007). "Systematic Planning for ICT Integration in Topic Learning." Educational Technology & Society 10(1): 148-156.

World Bank Group Education Strategy 2020 (2011). "Learning for All: Investing in People's Knowledge and Skills to Promote Development." Retrieved September, 2015, http://siteresources.worldbank.org/EDUCATION/Resources/ESSU/Education_Strategy_4_12_2011.pdf

APPENDICES

APPENDIX 1: 2013 ICT CENSUS IN SCHOOLS

The Department established the Digital Strategy Development Group (at the end of 2012) to oversee the development of a Digital Strategy for Schools. In spring 2013, as part of this process, the Department with the PDST-TIE, undertook a census of ICT use in primary, post-primary and special schools. The Department contracted the Educational Research Centre to input into the development of and conduct analysis relating to the 2013 ICT Census.

Two questionnaires issued to schools – a School Questionnaire which was completed by school principals of participating schools, and a Teacher Questionnaire, which was completed by selected teachers at specific class levels in those schools. Separate Questionnaires were developed for primary, post-primary and special schools.

The ERC carried out the analysis of the findings in relation to key themes and other parameters, involving the analysis of responses to individual questions and the identification of significant correlations emerging from cross-analysis between responses and international best practice.

The *Census Report*, 2013 ICT Census in Schools (Cosgrove et al., 2013a) provides a backdrop to the Strategy and outlines the challenges and opportunities facing schools in relation to effectively using ICT.
The 2013 report and the related research lead to conclusions in four broad areas:

- Learning, teaching and assessment using ICT, including use of ICT in teaching and learning, developing 21st century skills using ICT, and assessment and ICT.
- Teacher professional learning, including specifying teacher professional knowledge and supporting teacher professional learning.
- ICT Infrastructure, including internet connectivity, access to computing devices and other technologies, technical support and maintenance and purchasing and procurement.
- Research, policy and leadership, including research as a driver of policy and practice, and school leadership and planning.

The outcomes of the 2013 ICT Census of Schools can be downloaded at http://www.erc.ie/publications along with an accompanying Summary Report and Appendix Tables.

APPENDIX 2: CONSULTATION PROCESS

The Department engaged in a comprehensive consultative process for this Strategy. This began with the publication of the Consultative Paper *Building Towards a Learning Society: A National Digital Strategy for Schools* (Butler et al., 2013). The purpose of this paper was to establish a discussion framework for the vision, values, principles and policy directions that should be central to a dialogue around a new Digital Strategy for Schools. The period of public consultation around the Strategy by the Department[48] closed at the end of January 2014 and 124 submissions were received (see Appendix 3). Contributors to the consultation were asked the following questions

1. What is your vision or expectation for the use of ICT in supporting teaching and learning in schools for the coming 5 years?
2. What opportunities do you feel ICT in primary and post primary education can offer?
3. What do you think the priorities for schools in relation to ICT should be?
4. What do you see as the challenges for ICT implementation in schools?
5. What strategies should be deployed to improve the impact of ICT in teaching and learning?
6. What do you see as the critical success factors in the integration of ICT in teaching and learning i.e. the elements that are vital for the integration to be successful?
7. What key actions do you think should be undertaken to ensure ICT integration is achieved in schools?
8. Other Comments/Suggestions

These submissions were reviewed and analysed to inform the development of the Strategy. In addition, the Department engaged in focus group research with young people, parents/guardians and teachers while also consulting with a wide range of education partners on the emerging set of recommendations at regular intervals during the Strategy development process. The timeline for the consultative process is set out in Table 3 below:

TABLE 3. CONSULTATIVE PROCESS CHRONOLOGY

Event	Timescale	Description
2013 ICT Census in Schools	2013-2014	This report conducted an audit on the use of ICT in schools and identified key issues that needed to be considered in the Strategy.
A Consultative Paper: Building Towards a Learning Society – A National Digital Strategy for Schools	Published in December 2013	This paper published by the St. Patrick's College Drumcondra and the Educational Research launched the consultative phase of the Strategy.

[48] Digital Strategy Consultation Launch (http://www.education.ie/en/Press-Events/Press-Releases/2013-Press-Releases/PR2013-12-02A.html)

Event	Timescale	Description
Consultation Phase	December 2013 to January 2014	124 submissions were received by the Department – these ranged from individual to citizens representative bodies.
Focus Groups	June to September 2014	A range of focus groups were conducted with students, parents/guardians and teachers and in relation to ICT and schools.
Digital Strategy Development Group	January 2014 to February 2015	This group met regularly during the development of the Strategy and provided feedback on draft documentation.
ICT Steering Group	November 2014	This group provided feedback on the draft recommendations.
Consultation with key stakeholders	September to December 2014	The Department met with key stakeholders and discussed the emerging recommendations from the Strategy.

Consultation with Young People

The Department of Education and Skills partnered with the Department of Children and Youth Affairs (DCYA) to obtain the views of children and young people. The consultation process was informed by DCYA expertise in consulting with children and young people. Two facilitated consultation sessions were held in the National Digital Research Centre (NDRC) with 75 students:

- Post-primary consultation held on Friday, June 6th 2014 with 43 participants.
- Primary consultation held on Monday, June 9th 2014 with 32 participants.

The 75 participants demonstrated enormous clarity and insightfulness on the use of information and communication technology both in schools and in their daily lives. Young people have a mature perspective on how technology can be of benefit for living, learning and working in the future. Their perception is that currently, technology is something that is more relevant to their social lives and is of limited relevance in school. However, they have some clear ideas as to how ICT can benefit their education. Their main recommendations of relevance to the Digital Strategy for Schools can be summarised as follows:

1. Technology needs to become more relevant to learning in school. Currently, technology is something that is more relevant to their social lives and is of limited relevance in school.
2. Provide access to learning resources on the internet as these are often more up to date than those provided in textbooks or easier to understand than what has been presented by the teacher.
3. Use ICT to open up new forms of learning and collaboration and provide greater flexibility for students with different styles of learning.
4. Provide cloud based services such as email, online resource banks, organisation of teaching and learning resources, and the administration of homework.
5. Use ICT to record their work on an ongoing basis, accessing it at any time, and using ICT as their student journal.
6. Use ICT for administration including roll call in each class and the assignment of homework and homework feedback.
7. Teachers should have access to CPD on how to integrate ICT in the classroom.
8. All teachers in a school should use ICT in their teaching.
9. Use ICT to help students with specific learning needs such as dyslexia or dyspraxia.
10. Raise awareness of technology downsides such as plagiarism, distraction, over reliance on functions such as spell and grammar check, cyber bullying and access to inappropriate material and enable students to deal with these.
11. Help filter out unreliable or inappropriate sources and content.

EXCITED Conference

A series of 10 focus group workshops with young people took place on 29th May, 2014 to coincide with the EXCITED – The Digital Learning Festival held in Dublin Castle. The workshops examined the following key questions:

1. Why should we use technology in our classrooms?
2. What do you think is the most useful piece of technology to assist you in your learning at school and at home?
3. If you bring this technology to school, how would you use it to its full potential to learn?
4. How do you think schools/teachers should assist you in finding all the information you need?
5. How would you like to present your work to demonstrate your learning?
6. How do you think teachers should use technology in their teaching?

7. How would you like digital content presented to you?
8. How technology might be used effectively to collaborate with other students within the school and beyond?
9. Can students be trusted to use technology in the classroom responsibly?
10. How might technology be used to assess your learning?

The participants were very enthusiastic and provided insights into how they are using technology themselves and how they could see technology being used to enhance their own learning experiences. Feedback from both the student consultations and the EXCITED conference has been taken into account when compiling this Strategy.

Consultation with Parents/Guardians

A number of focus groups with parents/guardians of primary and post primary students took place across the country. The main points to emerge from these sessions were:

- All respondents had access to the internet at home.
- Parents/guardians defined their overall ICT competence as good.
- Most parents/guardians indicated that their children carry out research for school projects using ICT with the majority of parents/guardians indicating that their children do this without assistance from their parents.
- When asked if they were aware of how ICT was used in daily teaching activities, most parents/guardians were aware of the type of ICT equipment used in the classroom rather than having knowledge on how it was used.
- When asked about what they saw as the role of ICT in teaching and learning, the majority felt that since ICT is part of all aspects of life, it should also be part of school life.
- Parents/guardians felt there was lack of communication between school and parents/guardians on use of ICT in the classroom.

Other issues raised by parents/guardians included:

- Availability of funding for the strategy.
- The need for a device for each student.
- Maintenance of hardware.

Stakeholder Consultation

In the course of the consultation, the ICT Policy Unit also consulted with representatives from the following organisations:

- The Teaching Council
- Initial Teacher Education Providers
- Department of Education and Skills Support Services
- The Inspectorate
- ATECI (Education Centres)

- CoderDojo
- Digital Youth Council
- HEAnet
- IT Unit, Department of Education and Skills
- Special Education Unit, Department of Education and Skills
- Social Inclusion Unit, Department of Education and Skills
- Teacher Education Section, Department of Education and Skills
- Schools Procurement Unit, Department of Education and Skills
- ETB/SOLAS Project Management Office
- Department of Communications and Natural Resources
- Léargas – eTwinning
- CESI
- Management Bodies
- ICT Steering Group

APPENDIX 3: SUBMISSIONS TO CONSULTATION

1 Aladdin Schools
2 Anne Moloney
3 Anseo.net
4 Association of Community & Comprehensive Schools
5 Association of Teachers' / Education Centres in Ireland
6 ASTI
7 Athboy Community School, Athboy, Co. Meath
8 Barnardos
9 Beaumont Girls School, Cork City
10 Blackrock Education Centre, Co. Dublin
11 Brenda O'Neill
12 Bristol Myers Squibb Pharmaceuticals
13 Camara Education
14 Catherine Lynch
15 CBS Nenagh Secondary School, Nenagh, Co. Tipperary
16 CELT, NUI Galway
17 Centre for Research in IT in Education, TCD
18 Computers in Education Society of Ireland (CESI)
19 CJ Fallon
20 CK Education Limited
21 Claire Wood
22 Claudia Ní Chuláin
23 Cnoc Mhuire Secondary School, Granard, Co. Longford
24 CoderDojo Navan
25 Cornelius Young
26 Dabbledoo Music
27 Darrara National School, Clonakilty, Co. Cork
28 DCENR
29 Digilogue
30 Donal Horgan
31 Donegal ETB
32 Dublin 7 Educate Together NS, Grangegorman, Dublin 7
33 Dublin West Education Centre
34 Duncan McCarthy
35 eLearning Services
36 Emma Gallagher
37 ETBI
38 EU4Schools - Digital Online Curriculum Resource
39 Gabrielle Kelly
40 Gaelcholáiste Luimnigh, Meal Sior Anraí, Luimnigh
41 Gaelscoileanna Teo
42 Gill & Macmillan Publishers
43 HEAnet Limited

44 Hewlett Packard
45 Hibernia College
46 Highline Technology Ltd
47 Holy Cross Mercy School, New Rd, Killarney
48 Holy Family BNS, Askea, Carlow
49 IBM
50 ICT Ireland
51 Intel Ireland
52 Irish Association of Teachers in Special Education
53 Irish Computer Society / ICS Skills
54 Irish Free Software Organisation
55 Irish National Teachers' Organisation
56 Irish Primary Principals' Network
57 iScoil - online learning community
58 Iseult Mangan
59 Jim Devine
60 Joe Donaghey
61 Joint Managerial Body
62 Kildare Steiner Waldorf School, Dunlavin, Co. Kildare
63 Leckaun National School, Leckaun, Co. Leitrim
64 Liz Corcoran
65 Loreto Secondary School, Granges Road, Kilkenny
66 Marian Ryan
67 Marie McLoughlin
68 Marino Institute of Education, Dublin
69 Mark Finlay
70 Mary Immaculate College, Limerick
71 Mary King
72 Microsoft
73 Miriam O'Connor
74 National Adult Literacy Agency
75 National Association of Boards of Management in Special Education
76 National Centre for Guidance in Education
77 National Parents' Council Primary
78 National Parents' Council Post-Primary
79 NCBI Services
80 Neil O'Sullivan (Consultant)
81 Newtown Upper National School, Carrick-on-Suir, Co. Tipperary
82 Peter Lydon
83 Post-Primary Languages Initiative
84 Prim-Ed Publishing
85 Promethean
86 Rathfarnham Parish NS, Rathfarnham, Dublin 14
87 Sacred Heart SNS, Killinarden, Tallaght, Dublin 24

88 Sandra Ryan
89 School of the Divine Child, Ballintemple, Cork
90 Science Foundation Ireland
91 Scoil Bhríde National School, Dunleer, Co. Louth
92 Scoil Dairbhre, Dundalk, Co. Louth
93 Scoil Mhichíl Naofa, Galmoy, via Thurles, Co. Kilkenny
94 Scoil Mhuire, Ballymore Eustace, Co. Kildare
95 Scoil na Maighdine Muire gan Smál, Camus, Co. Galway
96 Scoil Oscair CNS, Lucan, Co. Dublin
97 Scoil San Nioclás, Stabannon, Castlebellingham, Co. Louth
98 Scoil Thomáis NS, Castleknock, Dublin 15
99 Scoil Uí Mhuirí Parents Association
100 Scoil Ursula, Strandhill Road, Sligo
101 Simon Grier
102 St Angela's College, Lough Gill, Co. Sligo.
103 St Canice's BNS, Finglas, Dublin 11
104 St Joseph's College, Lucan, Co. Dublin
105 St Joseph's Convent School, Caherciveen, Co. Kerry
106 St Joseph's National School, Athy, Co. Kildare
107 St Joseph's Secondary School, Castlebar, Co. Mayo
108 St Mary's Academy, Carlow
109 St Michaels College, Listowel, Co. Kerry
110 St Michael's Community College, Kilmihil, Co. Clare
111 St. Aidan's Primary School, Enniscorthy, Co. Wexford
112 St. Aiden's National School, Monasteraden, Co. Sligo
113 St. Brigid's School, Ard Easmuinn, Dundalk, Co. Louth
114 St. Joseph's Mercy PS, Navan, Co. Meath
115 St. Michael's & St. Patrick's NS, Boyle, Co. Roscommon
116 St. Patrick's College, Drumcondra, Dublin
117 St. Patrick's College, Drumcondra / Ceol Connected
118 St. Teresa NS, Balbriggan, Co. Dublin
119 Teaching Council
120 The Digital Hub Development Agency
121 The Educational Company of Ireland (Edco)
123 Tom O'Mara
124 University of Limerick

APPENDIX 4. STRATEGY DEVELOPMENT GROUP

1.	Eddie Ward	Chairperson, ICT Policy Unit, Department of Education and Skills
2.	Karen Murtagh	ICT Policy Unit, Department of Education and Skills
3.	Rita Sexton	ICT Policy Unit, Department of Education and Skills
4.	Seán Gallagher	PDST Technology in Education
5.	Martin Whyte	Inspectorate, Department of Education and Skills
6.	Deirdre Butler	St Patrick's College, Drumcondra
7.	Jim Enright	ATECI (Replaced Art Ó Súilleabháin who retired 2014)
8.	Neil Ward	Department of Education and Skills
9.	Anne O'Mahony	Curriculum and Assessment Policy Unit, Department of Education and Skills
10.	Ben Murray	NCCA
11.	Michael Hallissy	H2 Learning
12.	John Hurley	H2 Learning

APPENDIX 5: ICT IN SCHOOLS STEERING GROUP MEMBERS

1.	Malachy Molloy	Association of Community and Comprehensive Schools (ACCS)
2.	Fergal Canton	Association of Secondary Teachers Ireland (ASTI)
3.	Matt Melvin	Catholic Primary School Management Association CPSMA
4.	Finola Rossi	Department of Communications, Energy and Natural Resources
5.	Alison Gilliland	Irish National Teachers Organisation (INTO)
6.	Páiric Clerkin	Irish Primary Principals' Network (IPPN)
7.	Bertie Nesirky	Irish Second Level Students' Union (ISSU)
8.	Tony Brady	Joint Managerial Body (JMB)
9.	Gerard O'Sullivan	National Association of Principals and Deputy Principals (NAPD)
10.	Fred Boss	National Council for Curriculum and Assessment (NCCA)
11.	Áine Lynch	National Parent's Council - Primary
12.	Don Myers	National Parent's Council - Post-Primary
13.	Seán Gallagher	PDST Technology in Education
14.	James Kelly	Teacher Union of Ireland (TUI)
15.	Neil Ward	Department of Education and Skills
16.	Eddie Ward	ICT Policy Unit, Department of Education and Skills
17.	Rita Sexton	ICT Policy Unit, Department of Education and Skills
18.	Karen Murtagh	ICT Policy Unit, Department of Education and Skills

APPENDIX 6: ABBREVIATIONS

ACCS	Association of Community and Comprehensive Schools
ATECI	Association of Teachers' / Education Centres in Ireland
CESI	Computers in Education Society of Ireland
CPD	Continuing Professional Development
DCENR	Department of Communications, Energy and Natural Resources
DES	Department of Education and Skills
ERC	Educational Research Centre
ETB	Education and Training Board
FíS	Film in Schools also Irish word for Vision
ICT	Information Communications Technology
ISA	Irish Software Association
ISS	Inclusion Support Service
ITE	Initial Teacher Education
JCT	Junior Cycle for Teachers Support Service
LAN	Local Area Network
Mbit/sec	Mega-bit per second - unit for broadband speed
NBSS	National Behaviour Support Service
NCCA	National Council for Curriculum and Assessment
NCGE	National Council for Guidance in Education
NCSE	National Council for Special Education
NCTE	National Centre for Technology in Education
NEPS	National Educational Psychological Service
NIPT	National Induction Programme for Teachers
OECD	Organisation for Economic Co-operation and Development
OGP	Office of Government Procurement
OSS	Open Source Software
PDST	Professional Development Service for Teachers
PDST-TiE	PDST Technology in Education
PISA	Programme for International Student Assessment
PMDT	Project Maths Development Team
SEN	Special Educational Needs
SESS	Special Education Support Service
SSE	School Self-Evaluation
STEM	Science, Technology, Engineering and Maths
VLE	Virtual Learning Environment