ICT in Education:
Policy, pedagogy and practice

Discussion Document and Proceedings
of the Consultative Conference
on Education 2017

into
Irish National Teachers' Organisation
Cumann Múinteoirí Éireann

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Irish National Teachers' Organisation
Vere Foster House
35 Parnell Square
Dublin 1
D01 ET35

Phone: 01 804 7700
Email: info@into.ie
Web: www.into.ie

General Secretary: John Boyle

Cumann Múinteoirí Éireann
Áras Vere Foster
35 Cearnóg Parnell
Baile Átha Cliath 1
D01 ET35

Fón: 01 804 7700
Ríomhphost: info@into.ie
Gréasán: www.into.ie

Rúnaí Ginearálta: Seán Ó Baoill

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Guest Presenters	Seán Gallagher, Attymass NS, Ballina, Co Mayo Digital Schools: Ciara Reilly Paul Moroney Rosaleen O Haire Peter Creedon
Workshop Presenters	Michael Fabisiak, Susan Duffy & Micheál Bradley Maree Farrell & Mary Harrison Maggie Green Roy Mitchell Denis Moynihan Máire Nic an Rí Damien Quinn Ciara Reilly Rory Reynolds
Education Committee	Ger Stack, Cathaoirleach Siobhán Lynskey, Leas-Chathaoirleach Geraldine McGowan Sheena Quinn Tina McLaughlin Pat Collins Karen Devine Dolores Killian Alice O'Donnell Martin Lynch Celia Walsh Aidan Gaughran Gerry O'Sullivan Dympna Mulkerrins Áine Dillon Paul Moroney
INTO Education Team	Claire Garvey Ann McConnell Sharon Kane
Compilation and Editing	Deirbhile Nic Craith Maeve McCafferty

Foreword

Technology is not only transforming the way we live our lives but also how we teach in schools. The *Digital Strategy for Schools 2015-2020* (DES, 2015) and the *STEM Report* (STEM Education Review Group, 2017), both set out ambitious visions for embedding ICT in Irish schools. Currently, the NCCA is exploring coding in the context of wider primary curriculum developments, and, most significantly, our pupils are now part of a generation of 'digital natives' raised in a digital, media-saturated age. It is timely, therefore, to take stock of where we are at in terms of ICT in Education.

While technology has the potential to enrich teaching and learning, the efficacy of ICT in extending the learning experience for children will depend on a system-wide commitment to a multi-annual budget, technical support for schools, CPD for teachers, enhanced connectivity and efforts to address the infrastructural deficit.

The pace of technological change means that there is no easy identification of what works best. The INTO Education Committee therefore, decided to consider the theme of *ICT in the Classroom: Pedagogy, Policy and Practice* at the 2017 Consultative Conference on Education, to offer delegates the opportunity to attend different workshops - including a teacher-led *Teachmeet* - to sample a broad range of ideas and approaches.

This discussion document, prepared by the INTO Education Committee, charts the plethora of developments in ICT policy and reviews the good practice happening in schools. The INTO consulted with members this year on *The Use of ICT in Schools*. The findings from the survey flag the triumphs and tribulations faced by teachers in their efforts to integrate ICT into teaching and learning.

How ICT will evolve and continue to impact on schools, teachers and pupils remains an open question. We hope that the Education Conference, which includes keynote speeches, plenary sessions and workshops, will stimulate that discussion and provide an opportunity for delegates to share with and learn from each other's practice.

Sheila Nunan
General Secretary
2017

Part I

ICT in Education:

Policy, pedagogy and practice

A Discussion Paper

1

Introduction

Technology is transforming the way we all live our lives. Information and Communication Technology (ICT) has brought profound changes to almost every aspect of our lives in recent years and this change is nowhere more evident than in our classrooms. ICT in education can enhance, enrich and extend children's learning in primary schools. It can transform teaching and learning when deployed appropriately, substantially changing the traditional classroom to one where students learn collaboratively and construct knowledge for themselves. Learning is facilitated fantastically by ICT in ways that were not possible in the past.

Access to ICT prepares children for living in a rapidly changing society and prepares them for employment in new technologically advanced occupations. Skills in technology have become as fundamental to living a full life as being able to read, write and compute. Apart from being an engine of sustainable economic growth, technological skills are at the heart of a more cohesive, more equal and more successful society. Investment in ICT in primary education will pay significant personal, economic and societal dividends.

The overall ambition must be to ensure that ICT becomes an integral part of the teaching and learning process in every school, in every classroom and in every area of the curriculum. If supported sufficiently at system level, ICT has the potential to offer unprecedented opportunities to improve quality, access and equity in education and training. Integrating technology in teaching and learning acts as a motivator and has the potential to cater for individual learning needs across a wide range of ability.

The *Primary School Curriculum* aspired to 'integrate information and communication technologies into the teaching and learning process and provide children with opportunities to use modern technology to enhance their learning in all subjects' (NCCA, 1999, p.29). The use of ICT must continue to be interwoven across all aspects of the *curriculum* as a tension can emerge when ICT is presented as an add-on subject in an already over-crowded curriculum. It is not feasible to consider ICT as a stand-alone

subject requiring the development of separate skills needing distinct curriculum time but rather ICT should be considered as a tool and as a means for accessing the curriculum and supporting, enriching and extending teaching and learning. Teachers must be supported in embedding ICT in curriculum and assessment across all subjects. Notwithstanding the importance of skills, ICT in schools must emphasise teaching and learning, not just technology skills.

Technology in education is an ever-changing landscape and the rate of change has greatly accelerated to such a level that we hardly have time to appreciate the latest device or application (app) on the market when a new, generic version appears. As educationalists we witness innovations coming thick and fast with improved hardware such as tablets, PCs and other digital devices and through advancements in websites and software applications. This background document considers some of the many practices that are happening at a whole-school and classroom level in pursuit of enhanced learning experiences for pupils.

Over the years there has been no shortage of government policies outlining ambitious plans to embed ICT in education. Unfortunately, many of the aspirations in the documents never came to fruition as they failed to deliver on the promise of accompanying supports. On many occasions the failure to succeed was attributed to sustained under-investment at school level, a lack of a coherent, implementable, developmental national strategy and insufficient capacity to allow teachers to develop their professional practice. Each policy created expectations among teachers in relation to the use of ICT in primary schools but because of the continued system failures, they failed to realise their potential in the majority of schools. A chronology of these key polices is charted later in this document setting out the underlying premise and impact of each.

Despite the significant shortfalls of past governments and policies, there has been a renewed appetite for and commitment to investment in ICT in education. Recent key developments in this ever-evolving climate include the *Digital School's Strategy, The STEM Report*, *The Digital Learning Framework* and the ongoing work on coding by the *National Council for Curriculum and Assessment* (NCCA). In light of these advancements, it is timely for teachers and the INTO to consider the 'system needs' required to support the implementation of such policies and proposals. Moreover, to ensure that teaching and learning is at the heart of policy, it is pertinent that the voices of teachers shape and influence these developments.

In 2007, the INTO reported that 'while the vast majority of primary teachers along with most of the rest of the Irish workforce have embraced technology and use it in their work, full integration into the teaching and learning process and in all subject areas remains elusive' (p.24). The INTO carried out a comprehensive research project this year to elicit views from teachers on '*The Use of ICT in Schools'*. This survey explored the extent of integration of ICT across the curriculum and identified the perceived challenges still inherent in the system. In light of recent developments in ICT, it is anticipated that the research feedback will inform INTO policy in relation to ICT in education. The findings, presented in a later section of this document, were largely positive indicating that there have been improvements and progress in more recent years.

2

Policy

Background to the development of ICT in Irish Schools

The development of an information society based on ICT places demands on education systems, both to prepare young people to live in such societies and to harness technology in support of learning.

(OECD, 1999).

Information and communication technology (ICT), in one form or another, has been part of the education system in Ireland since the 1970s. The Computers in Education Society of Ireland (CESI) was founded in 1973 by a small, but dedicated, group of computer enthusiasts and has been hosting annual gatherings since then, funded initially by contributions from the teachers themselves and more recently by industry and some institutional sponsorship.

Over the years, however, serious deficiencies in policy relating to ICT in education have been noted. In a 1996 publication, the Irish National Teachers' Organisation (INTO) stated that "while the world around us is coming to terms with the fifth generation of computers, we in Ireland still await the first generation of computer literate primary school pupils". At that time, INTO identified major concerns and attributed the deficits in ICT to a lack of government commitment to developing a focused policy and strategic funding. The INTO claimed that Irish education called for an urgent re-direction so that children and teachers would be enabled to cope with the impact and challenges that technology presented to society. Three fundamental principles summarised the INTO's far-seeing recommendations, namely, that every child and teacher had a right of access to the curriculum through information technology at school, that teachers had the right of access to training in IT both in pre-service and in-service, and ICT would be integrated into the primary curriculum as a cross-curricular resource (INTO, 1996).

Other research during the 1990s supported the INTO's demands leading to a situation where some forward-thinking schools displayed a proactive approach. In the absence of a national policy, some schools began to develop IT skill courses resulting in the acquisition of basic IT skills (McKenna, 1993). Notwithstanding these early attempts by individual

schools, later studies carried out then found little use of ICT in teaching and learning in Irish schools (Drury, 1995; Mulkeen, 1997).

Throughout the 1990s, there was a series of programmes of investment in ICT in schools at an international level and it became apparent that other countries were rapidly overtaking Ireland in this domain. In 1994, Denmark began an educational network and a programme of in-service for teachers. In 1996, President Clinton announced a plan to connect all US schools to the "information highway" by 2000. The Dutch government established experimental teacher training institutes for the "school of the future" (Pelgrum & Anderson, 1999). In 1999, Sweden had committed to a National Programme for ICT in Schools. By the end of the 20th century use of ICT in education in Ireland was not comparable to international levels. As a consequence, it is only over the last 20 years that a range of policy developments have been introduced in relation to ICT in education. The widespread adoption and development of many of these ICT policies was arguably unsuccessful due to gross underfunding, infrastructural deficits, lack of teacher professional development and poor connectivity (INTO, 2015).

Schools IT2000 (1997)

International developments coupled with pressure from Irish society prompted the DES into action. In 1997, the DES published its first meaningful ICT policy framework document *Schools IT2000 - A Policy Framework for the New Millennium* (DES, 1997). Prior to its launch, computer use in Irish schools was inhibited by the absence of a clearly defined policy. With investment in excess of €50.79m, it was recognised that the *Schools IT2000* initiative was the first large-scale attempt to integrate ICT into teaching and learning in the Irish education system.

The main objective of *Schools IT2000* was to ensure that all pupils should have the opportunity to achieve computer literacy and to equip them for participation in the information society, while teachers were to be supported towards the development and renewal of their professional skills, and enabled to utilise ICTs as part of the learning environment. In response to the low levels of ICT use across the curriculum, a central aim of the *Schools IT2000* initiative was to provide in-service education and training for all teachers to enable them to develop the skills necessary to integrate ICT. The then Taoiseach, Bertie Ahern, described the initiative as "putting in place a comprehensive and innovative plan which will help revolutionise our schools" (DES, 1997).

Schools IT2000 created expectations among teachers in relation to the use of ICT in primary schools, but because of system failures it failed to realise its potential in most schools. The INTO suggested that this was a direct result of sustained under-investment at school level, coupled with the failure to invest sufficiently in and provide recognition for teacher professional development on an ongoing basis.

In the context of the social rationale, there was a very evident digital divide. Computers were not evenly distributed in homes and were more likely to be found in homes of the better off and better educated (OECD 1999). The *Schools IT2000* framework was cognisant of this and the document noted: "There are compelling reasons for integrating ICTs into the school system; it is clearly important that all young people, regardless of social or economic background, should have equal access to new technologies" (DES, 1997, p.15).

The National Centre for Technology in Education (NCTE) was established in 1998 to support the implementation of *Schools IT2000*. In order to achieve such an aim, a training continuum was developed with the objective of enabling teachers to progress from novice to expert users of ICT in schools. The NCTE reiterated the earlier INTO demands for more teacher training, increased funding for computers, improved connectivity and technical support (DES, 1997). The NCTE claimed that a special effort by government was needed to educate teachers in making use of ICT in their day-to-day teaching. The Schools Integration Project (SIP) was one of the NCTE's key initiatives focusing on whole school development. SIP examined and explored a range of teaching and learning topics specifically from an ICT integration perspective. SIP demonstrated some excellent examples of enthusiasm and innovation by teachers at local level, however, at system level the initiative was not supported sufficiently enough to ensure sustainability.

The Revised Primary Curriculum (1999)

Shortly after the launch of *SchoolsIT2000*, the *Revised Primary School Curriculum (NCCA, 1999)* included exemplars in each of the eleven curriculum subject areas on how ICT could be used to support teaching and learning. At the time, the introduction of the *Revised Primary School Curriculum* was accompanied by a comprehensive programme of professional development within school time. The *Revised Curriculum* stated that 'technological skills are increasingly important for advancement in education, work and leisure' (NCCA, 1999, p. 29). The curriculum restated its ambition to integrate

information technologies into the teaching and learning process and provide children with opportunities to use modern technology to enhance their learning in all subjects.

However, subsequent to the introduction of the *Revised Curriculum*, Mulkeen (2001) carried out research on the impact of *SchoolsIT2000* in Irish schools. He found that most primary teachers in his sample study were unaware of the initiative's policy documents. As part of his study Mulkeen (2001) also identified barriers to its implementation, such as, a lack of ICT skills, a lack of teacher awareness of possible uses, and a lack of time.

In an attempt to address challenges in integrating ICT across the curriculum, the NCCA developed a *Framework for ICT in Curriculum and Assessment* in 2007 which outlined the kinds of learning experiences with ICT (knowledge, skills, and attitudes) a student should be afforded through their primary and post-primary education. Underpinning the *Framework* document was the aspiration that it would be used as a tool to help teachers to integrate ICT in teaching and learning and it provided a range of exemplars appropriate to different class levels.

Blueprint for the future of ICT in Irish Education (2002)

The *Blueprint for the Future of ICT in Irish Education* (DES, 2002), provided for further investment of €107.92m in ICTs for schools. This plan recognised the central role for school principals in determining the ICT needs of schools, planning infrastructure and coordinating training needs. Seminars designed to help all principals and key decision-makers were provided as part of this plan. Advice was given as part of this plan for progressing skill-sets and technical infrastructure in schools. In May 2004, the DES allocated €18 million to provide broadband connectivity to schools. The DES also promised to provide funds for school networking which would be further enabled by the provision by the state of a range of centrally hosted services. The announcement of this investment was timely as there was a growing perception among Irish primary school principals that the interest in ICT in schools had dissipated since the initial investment in 1997 (McGarr & Kearney, 2009).

ICT in Schools (2008)

In 2008, the Department's Inspectorate carried out an evaluation of how ICT was used in Irish schools. The research report examined the extent to which ICT had been used in schools at both primary and post-primary levels in Ireland. The research assessed the impact that ICT had on teaching and learning, including the ways in which ICT was used

to support the learning of students with special educational needs. The resultant report entitled, *ICT in Schools,* highlighted positive aspects of ICT usage in schools, but also pointed to deficiencies in infrastructure, technical support, and the integration of ICT in teaching and learning (DES, 2008). The findings and recommendations from that DES research was of particular relevance to teachers, principals, school support services, curriculum developers and policymakers. Moreover, the findings of the research were intended to inform debate and policy decisions on how to ensure that young people have the skills, knowledge and attitudes necessary to benefit from the opportunities presented by this learning through ICT into the future. In addition, in 2008, the ICT Strategy Group appointed to advise the Department on ICT investment priorities, published a second report, *Investing Effectively in ICT in Schools 2008-2013* (DES, 2008a).

Smart Schools=Smart Economy (2009)

Subsequently the DES published *Smart Schools=Smart Economy (DES, 2009)* and allocated €92 million to schools in the form of government grants. The policy was based on the premise that investing in ICT in education would help develop a smart economy and lift Ireland out of the depths of recession. *Smart Schools=Smart Economy* outlined its commitment to addressing the infrastructural deficit in schools' basic technology systems and a pledge to provide teaching-computers coupled with educational software and digital projection. The document was replete with the language of business and underpinned by neo-liberal ideology. The policy reiterated the government's commitment to partner with ICT industry in education with a view to ensuring the development of a smart economy. The partnership approach aspired to help Ireland regain its competitiveness and national prosperity, through a prudent technology-investment strategy in schools.

Digital Strategy for Schools 2015-2020

The publication of the *Digital Strategy for Schools (DES, 2015)* is a recent and ambitious programme which aims to embed technology and digital learning tools in primary and post-primary schools. The *Strategy* sets out a vision for the role of ICT in teaching, learning and assessment for schools in Ireland. The *Strategy* envisages that it will enable all stakeholders to work together to support the integration of ICT in every classroom in a systematic and focussed way.

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

• Theme 1: Teaching, Learning and Assessment Using ICT: ICT is seen as a powerful tool that can change the way teachers teach and how students learn. It aims 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.

• Theme 2: Teacher Professional Learning**:** the Strategy aims to enhance access to and impact of CPD for teachers through extending CPD formats to include online and blended learning programmes. It also aims to (i) promote *Scoilnet* and associated sites/services as the national reference point for schools for high quality digital content and (ii) to provide information to teachers on innovative ways to use digital technologies more actively in their own teaching, including exemplars of good practice and facilitating the sharing of this information among teachers.

• Theme 3: Leadership, Research and Policy: the Strategy hopes to (i) extend the scope and reach of student-learning beyond the walls of the classrooms; and (ii) reflect technological and educational developments through updating the eLearning in *Your School* planning resource (from 2009) to assist schools in further developing their eLearning policy thus providing teachers and schools with clarity around the concept of embedding ICT into teaching, learning and assessment.

• Theme 4: ICT Infrastructure: the Strategy will explore and recommend technical support solutions by addressing the ICT infrastructural requirements of schools. An ICT Equipment grant was developed for the timeline of the Strategy (first tranche to be available for the 2016-2017 school year) and commitments made to continue to improve broadband services to schools.

The STEM Report (2016)

In 2016, a further attempt was made to emphasise the importance of technology in education with the launch of an expert report on education in Science, Technology, Engineering and Maths (STEM) in Irish schools. The *STEM Report* sets out a programme to deliver on the ambition of making Ireland a world-leader at providing STEM education. The report recognises the importance of ICT and sets out a clear vision for the role of digital technology. It outlines the extent of economic and job opportunities for Ireland that are dependent on high quality STEM education, and also recommends that a sea-change is needed in the provision of that education if we are to compete on an

international level. It also sets out how, for social policy and community reasons, it is important to have scientifically literate citizens in a modern democracy. The report outlines 21 actions for initial priority implementation including a commitment to improving continuing professional developments for primary teachers. The report recommends the development of specialist STEM teachers (STEM champions) who would hold a postgraduate qualification in STEM Education and lead STEM Education in schools. It is also anticipated that technology will be used to facilitate internal collaboration in STEM subjects between schools.

The Digital Learning Framework (2017)

Most recently, a new *Digital Learning Framework* for primary and post-primary schools has been developed by the DES and it was made available to all schools for the 2017/2018 school year. The implementation of the *Framework* will initially be trialled in a cross-sectoral representative sample of approximately 30 primary and 20 post-primary schools and the outcome of this trial will inform the national roll-out of the Framework in September 2018. The *Digital Learning Framework* represents one of the key supports envisaged under the *Digital Strategy for Schools 2015-2020*. In implementing the *Digital Learning Framework*, schools and teachers are given a structure that will allow them to identify where they are on the journey towards embedding digital technologies in teaching, learning and assessment. The trial of the *Digital Learning Framework* is currently underway.

Concluding Comment

This chapter has provided an overview of some of the key developments regarding ICT in the Irish education system. The current situation in relation to ICT in schools directly reflects the approach taken by a succession of governments through various policies over the last 20 years, an approach that, for the most part, has been haphazard, unstructured and discontinuous. Consequently, there still exists a range of significant obstacles that impede the more widespread adoption and development of digital approaches. It remains to be seen what the outcome of the more recent ambitious and visionary policies will be especially in relation to teaching, learning and assessment in the classrooms in Irish schools. The success of policies such as *The Digital Strategy* and *The Digital Learning Framework*, will depend on a commitment from government to focused funding, teacher development, strategic investment in infrastructure and ongoing technical support.

3

Practice

Whole-School

The presence and the use of technology in our schools have changed dramatically in the last decade. Schools moved from having one computer at the back of the classroom to using a laptop with a projector which in turn led to the widespread use of interactive whiteboards. This, coupled with improved access to the internet in schools, has fundamentally changed how classrooms access information. Instead of preparing posters for lessons, teachers are now using technology to create and share resources for their teaching. As the presence of technology in our schools increased so too did the demand for a higher ratio of access to devices. Gone was a single computer at the back of the class to be replaced by a demand for dedicated computer rooms. However, with the advent of mobile technology many schools have decided to replace traditional computer rooms with a suite of devices that can be brought into the classroom. This took the form of laptop trolleys that were moved from classroom to classroom. Many schools have taken this a step further by using tablets that can be transported around the school. These devices are smaller making them perfect to share at a school desk. They are easier to handle and have a much better battery life. As the cost of these devices decreases over the coming years it will, perhaps, allow schools to move towards having one device per pupil.

School Administration Software

Many principals now use systems such as *Aladdin* to reduce the amount of time spent on routine administrative tasks. Some of these fully comprehensive admin systems allow schools to manage applications for enrolment, communicate between staff and parents, streamline DES returns, take electronic rolls, monitor attendance, import data, track money, generate report cards and engage in school and class planning. Systems are generally cloud-based and can be accessed remotely 24/7. Generally, these systems are safe and secure as they are password protected.

School Policy

Given increasing online and digital activity in schools, it is recommended that each school has an Acceptable Use Policy (AUP) which details the safe usage of Internet, mobile phones and related devices in a school. It is important to note that '*... a clear AUP detailing possible sanctions ... can provide legal protection*' to a school (webwise.ie). An individual teacher can begin the process by setting up a co-ordinating group or committee (with the principal's permission) but all school stakeholders should be involved in the formation of such a policy, including teachers, students, boards of management, parents and guardians. Students, parents/guardians should be asked to sign the AUPs and internet permission forms. These forms should be subject to regular review and updates. All correspondence in relation to AUPs with students and parents should explain the need and importance of AUP and how it forms ICT policy in the school.

An AUP should address all rights, responsibilities, privileges and sanctions associated with computer use, as well as legally protecting the school from liability. Key issues which schools consider when creating an AUP include assessing how the use of email will be managed, deciding on access to chatrooms and the likely sanctions to be imposed for breaches of policy. The AUP is generally based on a school's current ICT use and any existing policy.

The School Broadband Programme (SBP) offers all Irish schools content filtered broadband. This service is managed by the PDST Technology in Education and all schools in Ireland are connected to the SBP. This filtering system is split into six different levels – level one being the most restricted and level six allowing more open access. Schools are free to choose the level of content filtering that suits their usage. Under this plan, websites are placed into a category depending on content. While personal devices have the potential to enhance teaching and learning opportunities, pupil devices are not part of the school's network, therefore, they will not be protected by the SBP content filtering. Therefore, even with internet content filtering in place schools must still address responsible online activity through the AUP.

Teaching and Learning

It is not only the infrastructure and hardware aspects of technology that have changed dramatically in our schools over the last decade but also the software. The way in which teachers and students use technology for teaching, learning and assessment has complemented traditional methods and allows teachers to provide exciting opportunities

for children to enhance their learning. Students have moved from consumers of ICT content to creators of it. They can now use programs like *Scratch* to create their own educational software. Instead of using *PowerPoint* presentations to display information, they can now use a multitude of dynamic ways to share their knowledge such as *Prezi, Adobe Spark, Book Creator, Toontastic, YouTube* to name but a few. Schools have also embraced technology using it for communication and administration through the use of software such as *Aladdin*. The taking of attendance and recording in roll books has been moved to this online space as well as student records, planning, report cards and a whole host of administrative work that is certainly having a positive impact on the environment as we move towards a paperless future.

Virtual Learning Environments

Technology has also revolutionised how students communicate with each other as well as their teacher. Programmes and apps like *Schoology, Edmodo, Moodle, Google Classroom, Class Dojo* allow students to communicate effectively and safely with their teachers in the classroom and at home. They allow teachers to assign and grade tasks, share resources and links to useful websites. Teachers can design activities such as quizzes and polls that are relevant to the student's learning. There is also a facility to communicate with parents about their child's learning. These virtual learning environments allow students to work at their own pace and enable them to complete work over a number of days or weeks and within an agreed timeframe if required. Programmes such as *Khan Academy* will even determine what level the student is at and tailor the learning accordingly, though the role of such private companies in education needs to be carefully monitored. Traditionally, collaborative learning happened in a group around a desk in the classroom but now there are endless possibilities beyond the classroom walls. Children can work together on projects both at school and at home and can even collaborate with students from other schools in Ireland and around the world. With programmes and apps like *Padlet* or *Google Docs* students can work together on a document or a project in real time from any location.

The Flipped Classroom

The flipped classroom is a model of teaching in which teachers post videos online in lieu of lessons in the classroom. Content is delivered at home instead of traditional homework and students spend class time actively working on tasks to assimilate learning. The concept of delivering content at home to free-up time in class has been promoted to teachers in Ireland through the successful teacher blog, *RangBianca*. A study by the

pioneer of 'the flip classroom', Baker (2000) found that students described the learning as more personalised, the cooperative groups fostered critical thinking, and the online resources provided students with more control over their learning. The website *RangBianca* reported that homework was always complete 'after the flip' and children are less likely to give up as quickly. Moreover, the model gives parents the opportunity to learn alongside their children, rather than struggling to help them with task-based homework.

Assessment

Assessment is another area that is being transformed by technology as many teachers move from Assessment *of* Learning to Assessment *for* learning. Assessment tools such as *Kahoot!* and *Socrative* provide teachers with a platform to design and share quizzes that can be reused over time. They will also correct the questions and provide the results for the teacher. Another recent development in educational technology is the use of e-Portfolios through the use of an app. like *Seesaw*. This allows the students to record images/audio/video of their work as well as saving links to work or projects they may have created online. Each student can develop their own e-portfolio that is stored online and can grow with them as they move up through the school. This can be shared with their parents/guardians and it provides an excellent insight into their child's learning.

Teachers also employ technology for planning and recording purposes. It is considered best practice when dealing with sensitive or personal information relating to a particular child, such an individual educational plan (IEP), that every effort is made to protect sensitive data using password protected files. This is particularly important when data is held on mobile devices.

Assistive Technology

"For people with disabilities, technology can change the most ordinary of daily activities from the impossible to the possible"

(Enable Ireland, 2016)

The use of assistive technology (AT) has transformed the learning experiences of children with special educational needs (SEN). AT refers to any item of equipment that can be used to improve the functional capability of a student with special educational needs and is of direct educational benefit to them. The Special Education Section of the DES provides funding to schools towards the purchase of equipment for pupils with physical or communicative needs who have been assessed as having a special educational need that requires specialist equipment in order to access the curriculum. The Assistive Technology

Scheme is pupil-specific and based on the pupil's needs, as determined by the associated professional. Key characteristics of the AT recommended by the DES included the functionality of the AT intended to facilitate access to effective education and/or any item of equipment that could be used to improve the functional capability for a pupil with special educational needs that is of direct educational benefit to them (NCSE, 2013, p.121).

In 2016, the NCSE published a report *Assistive Technology/Equipment in Supporting the Education of Children with Special Educational Needs – What Works Best?* (NCSE, 2016) to try to identify the types of technology which worked best for students with special educational needs. As part of the report the NCSE surveyed teachers who had experiences of the processes involved in the acquisition of AT and of its impacts. The main findings from the teachers' survey suggested that teachers' level of familiarity with AT differed. According to the teachers, while school principals were consistently involved in the AT acquisition process, the levels of training and support for teachers were identified as a problem for teachers, especially for those with lower levels of familiarity with AT. Specifically, teachers identified significant problems with issues such as the length of the process, the difficulties of qualifying for AT and the support for the equipment post-installation. Despite these problems, teachers generally rated the impacts of the AT positively.

Ranging in sophistication from 'low' technologies, such as a graphic organiser, to 'high' technologies including cutting-edge software and smart phone apps, assistive technology is a growing and dynamic field. Several areas of assistive technology and sample products can be found in any classroom, making a difference to how students of all abilities learn. Some of the most popular AT devices used with pupils with SEN to assist them to accomplish tasks include screen readers, screen magnifier software, text input software, head pointers and eye tracking devices. These devices allow pupils with SEN an alternative way to access teaching and learning.

Digital Safety

The internet is ubiquitous in the lives of the pupils we teach. The generation of pupils in our primary schools are commonly referred to as 'digital natives' such is their familiarity and competence in using digital devices as part of their everyday lives. CyberSafe Ireland reported that 72% of Irish children are using the internet daily in their homes (2017). Although the internet can be a great tool to assist teaching, learning and assessment, it also contains dangerous content and can be abused, making pupils and teachers alike

vulnerable and exposed to risk. Consequently, many practices in schools are implemented with a view to safeguarding pupils and teachers online.

The majority of Irish children will have completed their primary school education before they reach the age of 13, therefore, the age of consent for online services such as social media should, largely, not be an issue for primary school teachers. Under the incoming EU General Data Protection Regulation, member states may set their national age anywhere between 13 and 16 (the age at which children do not need the explicit approval of their parent or guardian). Although the default age is 16, the de facto age in Ireland has been 13 for some time now.

Pupils are particularly exposed to the dangers of the internet through activity on social networking platforms. According to a *Net Child Go Mobile* report, Instagram is the most popular media-sharing platform with a reported 42% of 9-16 year olds favouring this site to share photos (O'Neill & Dinh, 2015). One in five children has reported that they have received nasty content online from someone in 2015 – a figure which has more than doubled since 2011. Smartphones are used by 35% of 9-16 year olds to go online, followed by laptops (29%) and tablets (27%). In terms of teacher mediation, children reported that teachers are as supportive as parents in providing guidance about safe internet usage, indicating that teachers are promoting the concept of responsible digital citizenship in schools.

When it comes to personal use, many teachers have their own social media account. Everything posted online has the potential to become public. Teachers can control and restrict privacy settings in an effort to reduce online, personal activity which may have implications for their professional lives. The Teaching Council's *Code of Professional Conduct*, which is used as a reference point for Fitness to Teach investigations, stipulates that teachers must ensure that "*any communication with pupils/students, colleagues, parents, school management and others is appropriate, including communication via electronic media, such as e-mail, texting and social networking sites*." In addition, teachers must "*avoid conflict between their professional work and private interests which could reasonably be deemed to impact negatively on pupils/students*." Taking the time to read some of the social media tips outlined in this paper can help ensure that personal social media use does not become a professional issue.

Concluding Comment

ICT in primary education must serve the pedagogical principles of the curriculum such as activity and discovery learning, child-centred authentic learning, environment-based learning and language being central to the learning process. The use of technology in education can enhance and extend the development of higher-order thinking and problem-solving skills, foster collaborative learning opportunities and cater for individual difference by supporting assessment. The ways in which ICT can shape and influence what and how children learn are endless. Teachers and schools are involved in a wide range of innovative and inspiring practices that use technology to transform teaching and learning.

4

Pedagogy

"Pedagogy is the interactions between teachers, students, and the learning environment and the learning tasks"

Murphy, 2008

Pedagogy and ICT

Education is evolving at a phenomenal rate due to the digital revolution. Classrooms are becoming multimodal. Multimedia applications are part of every teacher's toolkit – whether it be *YouTube* videos to enhance a history, geography or science lesson, the use of *Google Maps*, videos to enhance the teaching of music or lessons found while preparing. Multimodal written text, pictures, audio, or videos are commonplace in classrooms. As the learning environment reflects these changes, as the tools for teaching evolve, so also do our pedagogies. At the core of pedagogy are teaching methods and classroom organisation.

The way we teach and learn has been changing dramatically, as have the tools and resources available to teachers. Where once teachers used chalk and blackboards as the tools in the classroom, they now use data projectors, *PowerPoint* presentations and interactive whiteboards. In the memory of many still serving teachers - pupils wrote on cláiríns with chalk or used pen and ink. The tools to record learning and make learning visible have changed beyond recognition. Now pupils regularly use *Microsoft Word* to produce work. If a pupil wanted to look something up, they were once directed to the school library. Now browsers are being used and it is unimaginable to research a topic without having recourse to the internet. Learning once took place mainly in classrooms – now children often complete project work using internet sites at home. E-learning in the shape of submitting assignments and other work to teachers via e-mail has not yet gained much traction in primary schools, but it has among our secondary colleagues. In short, the way we teach and learn has been changing, and it will continue to do so.

The challenge for teachers is how to integrate 21st century skills with the traditional core curriculum content. Pupils in modern classrooms are natives of a '*technoculture'* and are fearless navigators through that landscape. Our challenges include, but are not limited to, the integration of emergent technologies into classrooms. Also, limited resources, whether that is a lack of computers in classrooms, or limited access to broadband, will limit the impact of technologies on the teaching and learning interaction which is at the heart of pedagogy.

Bolter (2001) argues that the computer is the most significant development since the start of the alphabetic/print tradition. It is a catalyst for transforming teaching and learning in the modern classroom. How computers and other technology is integrated into classroom practice is largely dependent on teachers. There are many variations, from small adjustments in classroom practice to full integration. Research studies indicate that a teacher's pedagogical orientation is the principal factor in how teachers use digital technology in the classroom (OECD, 2015).

Teachers bring their own professional understanding and judgement to bear when planning and preparing for the teaching and learning which goes on in their classrooms. They are becoming adept at creating multimodal spaces. As teachers prepare, they must use their understanding and comprehension to adapt and transform the materials they find. They can then tailor the materials to aid in their instruction in the classroom. It has been established that the use of ICT in lessons is greatly influenced by and indeed heavily dependent on teachers' own knowledge and competence (Cox et al, 2003). Everything teachers do is shaped by their values and beliefs. Confidence is key, and if teachers are confident in their judgement and abilities this lends itself to informed and effective classroom practice.

The centrality of development of teachers' ICT skills

As technology advanced in the late 1990s, the importance of teacher skills in the adoption of ICT in schools was recognised (OECD 1999). In Ireland, the necessity to develop teacher skills had been recognised by the Information Society Commission (ISC), which recommended that *"investment in the professional development of teachers and trainers is a primary determinant of successful educational reform and must continue to be a priority"* (1999, p.31). As already referenced, it was the launch of *Schools IT2000* initiative in 1997 that signalled the start of the integration stage of computer use. In order to achieve integration, *Schools IT2000* aimed to provide a training continuum for

teachers to progress from novice to expert users of technology and provide an infrastructure in their attempts to integrate ICT into teaching and learning. However, it transpired that such integration required more than skills acquisition. Short-term courses delivered in the absence of an overall policy indicated that there were problems associated with the transfer of acquired knowledge into classroom use.

Furthermore, McGarr and O'Brien (2007) found that cultural and systemic factors within the school system continued to curb the intended integration of ICT into teaching and learning in schools. It would appear, therefore, that despite the continued drive to integrate ICT, real change did not occur because long held beliefs and traditions hindered change. Clearly at that time, the integration of ICTs into the school curriculum necessitated major changes in the practice of teaching. To be successful, the changes envisaged in integrating ICT into the curriculum required each school to reflect seriously on its traditions, potentials and limitations.

At the end of the 20th century, there was the possibility that ICT could facilitate the adoption of a new paradigm of education involving a more learner-centred, collaborative and exploratory type of education (Pelgrum and Anderson, 1999). That possibility was mooted in the *Schools IT 2000* strategy and the aspiration was expressed that ICT could have a catalytic effect in schools (DES, 1997). A major international study conducted by the *International Association for the Evaluation of Educational Achievement* concluded that there were clear examples of ICT facilitating this kind of change in education but that it was not the universal experience (Pelgrum & Anderson, 1999).

School Leadership and the integration of ICT within schools

The integration of technology in education has not only transformed the role of teachers but it has also transformed the role of school leaders. Akbaba-Altun (2004) claimed that it is inevitable that school principals will have new roles as the use of ICT continues in schools. Yet the task of providing effective leadership is a challenging one as Collinson and Cook (2004) highlight challenges such as encouraging dissemination, collaborating with teachers, and encouraging and facilitating peer observation for interested teachers. Flanagan and Jacobson (2003) argued that principals were themselves often required to provide leadership in areas with which they were unfamiliar – many of them not having been prepared for their new role as technology leaders - and had struggled to develop both the human and technical resources necessary to achieve ICT-related outcomes in their schools.

Ultimately, principal teachers are the key pedagogical leaders and as such, their views and thought processes in relation to ICT can have a major bearing on the extent to which new technologies become embedded in the teaching/learning process in schools. Schiller (2003) argues that without the school leader's support 'the educational potential of ICT may not be realised' (p.171). Technology has brought considerable change to the culture and practice in our schools. Hughes and Zachariah (2001) found that 'success or failure of technology integration could be linked to the behaviours and ideologies of the instructional leader' (p.2).

A study by McGarr and Kearney (2009) investigated the state of ICT in a selection of small schools led by teaching principals who, in addition to their leadership, have responsibility for teaching a multi-grade class. This leadership role included responsibility for formulating ICT policy and giving leadership in the use of technology in the curriculum. The study revealed that teaching principals were particularly challenged by the issue of inadequate infrastructure and a lack of technical support, for example, when breakdowns occur or where there is poor quality or no broadband connectivity. Teaching principals already face challenges with many aspects of their role, therefore providing leadership in the use of ICT greatly increases their burden when they are already beset by increasing demands for accountability and additional administrative tasks allied with their core responsibility, which is teaching their pupils.

Concluding Comment

Ultimately the principal teacher is the keeper of the school's vision including its vision for ICT. Opportunities for collaborative leadership where other members of staff take on posts of responsibility were diminished during the recession due to the embargo on filling promoted posts. Notwithstanding this, the principal teacher is the one who is responsible for leading and driving change in attitudes and practices in regard to ICT integration across the curriculum. Effective pedagogical leadership is impossible when those in leadership positions are not familiar with the potential ways that ICT can support teaching and learning across the curriculum. School leaders must be supported in their role as agents for change through professional development and system-wide, co-ordinated technical support structures.

5

The use of ICT in Education: Findings from INTO Research

Introduction

In advance of the '*Education Conference 2017 – ICT in Education'*, the INTO consulted with members to determine teachers' perceptions on the use of ICT in primary schools in Ireland. ICT in education is changing and developing on an ongoing basis, therefore, it was considered timely to generate up-to-date data that reflects the current trends and practices in schools. It is anticipated that the feedback elicited from this study will inform future INTO policy in relation to ICT in education. In light of the publication of the *Digital Strategy for Schools (DES, 2015)* and the *Digital Learning Framework (DES, 2017)*, as well as ongoing work by the NCCA on Coding, the INTO recognises that the voices of teachers and school principals are critical in shaping and influencing educational policy around ICT in education.

Methodology

The research project adopted a mixed method approach involving a self-report survey with teachers and focus groups with principal teachers. In 2017, teachers participating in the INTO online summer courses were requested to complete a survey on *'The Use of ICT in Education'* as part fulfilment of a module assignment. The survey instrument comprised of multiple choice and Likert scale items. The survey was compiled using Survey Monkey.

The findings from this strand of the study need to be interpreted with some degree of caution, as the sample of teachers was a convenience sample and may not be representative of all teachers. Furthermore, the sample of teachers was drawn from those participating in an INTO online summer course suggesting that the respondents would have some degree of familiarity with using ICT. In addition, this is an opinion survey where all findings are from self-report measures.

There were 5,233 teachers registered on the 2017 INTO online summer courses. A total of 2,475 primary teachers responded to the survey. In addition, in order to explore further

and extend the findings from the survey, the INTO also held focus groups with principals attending the INTO School Leadership summer course. Principals considered ICT in Education under the following broad areas: teaching and learning, connectivity, maintenance, communication, challenges, resources and cyber safety. There were three focus groups each with six to eight principals. This chapter presents a summary of the findings from both the survey and the focus groups. The findings are presented below according to the key themes that emerged.

Biographical and school information

Based on the DES's most current figures at the time of writing, the profile of respondents was broadly representative of demographics and schools in Ireland. Among the primary teachers who completed the online survey (n=2,475), 86% were female and 14% were male. More than a third of the teachers (n=916) who participated in this study had 10-20 years of teaching experience, 26% of respondents had 5-10 years of experience and 15% had taught for 0-5 years. Only 12% had 20-30 years of experience in the classroom, and 10% were teaching for 30+ years.

Among the respondents, 55% defined their roles as mainstream classroom teachers. Some 5% of respondents were teaching principals and 4% were administrative principals. The proportion of respondents engaging in learning support work and/or resource teaching was 29%. Smaller percentages of participants identified themselves as special class teachers (6%). Teachers from each class level – junior infants to sixth class - were represented with a reasonable degree of balance, varying from sixth class teachers (18%) to infant teachers (34%). The respondents reflected both multi-grade and single stream teachers. Almost 63% of respondents defined their school as urban/suburban and the remaining 37% were teaching in rural schools.

Access to ICT

Respondents were asked to what extent they had access to ICT in their classroom. Some 80% of teachers reported that they always had access to a teaching technology device. A significant majority of teachers surveyed indicated that they always had access to a digital projector (63%) or an interactive whiteboard (72%). More than four in five participants reported having access to a shared printer while only one in five teachers had access to an individual printer. Smaller numbers of respondents always had access to a digital visualiser (33%) and digital cameras (44%). Less than 5% of teachers indicated that students had direct access to an individual computing device in class. The respondents

reported that students were more likely to occasionally have access to a shared device (42%). Some 15% of teachers stated that their students always had access to a dedicated computing device in a computer room while 57% did not. The participants in this survey suggested that, of their students with special educational needs, only 21% and 20% had access to a dedicated computing device and assistive technology, respectively.

Barriers to the effective implementation of ICT

Teachers were asked to identify the key barriers to the effective implementation of ICT in classrooms and schools. Some 34% of respondents identified insufficient access to ICT devices for students as the key stumbling block, followed by 33% who cited pressure to 'cover the curriculum' as a challenge. Others reported that insufficient access to high quality broadband (30%) was a barrier, followed by insufficient levels of immediate technical support (28%). Some participants (20%) also reported that they had insufficient time for planning and preparation for integrating ICT into the curriculum.

Connectivity

Participants were asked to consider connectivity in their school. Of those surveyed, 71% said that they have a wired internet connection in their classrooms while 29% did not. Almost 78% of teachers surveyed noted their PCs/iPads were connected with WiFi. Respondents were asked to rate the speed of the broadband in their schools. In total, the majority of teachers (61%) rated the speed as either good or very good. However, just under a third (30%) of teachers regarded the pace of their broadband as either fair or poor. Only a smaller proportion of respondents (9%) graded their internet quality as excellent.

Participants considered how faster broadband would support teaching, learning and assessment. The vast majority (84%) reported that faster broadband would reduce uploading delays and, thus, ensure better classroom management. A similarly large proportion of respondents (78%) suggested that more reliability would give teachers more confidence to use technology in the classroom, while 59% of teachers believed that faster broadband would elicit more engagement from pupils.

In the focus groups it emerged that considerable variations existed in the speed of broadband. While many principals reported that connectivity has improved considerably in recent years, one principal commented that 'things were probably faster when we had

dial up'. It was noted that delays in streaming content can create challenges for classroom management as pupils become impatient.

Teachers' perceptions of ICT in Education

In order to assess teacher attitudes and beliefs towards the use of ICT in the classroom respondents were asked to indicate their level of agreement with a variety of statements. The majority of participants (67%) strongly disagreed with the statement that ICT in primary classrooms was a waste of time. Conversely, less than 1.5% strongly agreed with the statement. Significantly, 62% of teachers strongly agreed that ICT is very effective for school administration. In total, the majority of respondents (58%) either agreed or strongly agreed that ICT should be a subject in the curriculum. However, teachers expressed frustration with the lack of technical support with over half of teachers surveyed (n=1,304) either agreeing or strongly agreeing that there is no point in pursuing ICT unless all schools have access to technical supports. It was very encouraging that teachers agreed (50%) or strongly agreed (40%) that they have a positive disposition and attitude towards the integration of computing resources in the teaching-learning process. Almost half the respondents (48%) disagreed that students usually have more knowledge than them in the use of computing resources. An overwhelming majority of respondents (85%) indicated an overall agreement with the statement that students are more motivated when using computing resources in the classroom. In addition, over half the teachers surveyed agreed that the use of ICT increases their own motivation as a teacher. Significantly, there was almost unanimous agreement (96%) that ICT is a useful tool in supporting children with special educational needs. Almost all respondents used computers, interactive whiteboards and projectors (91%) in their classrooms and employed the internet to source teaching resources (98%).

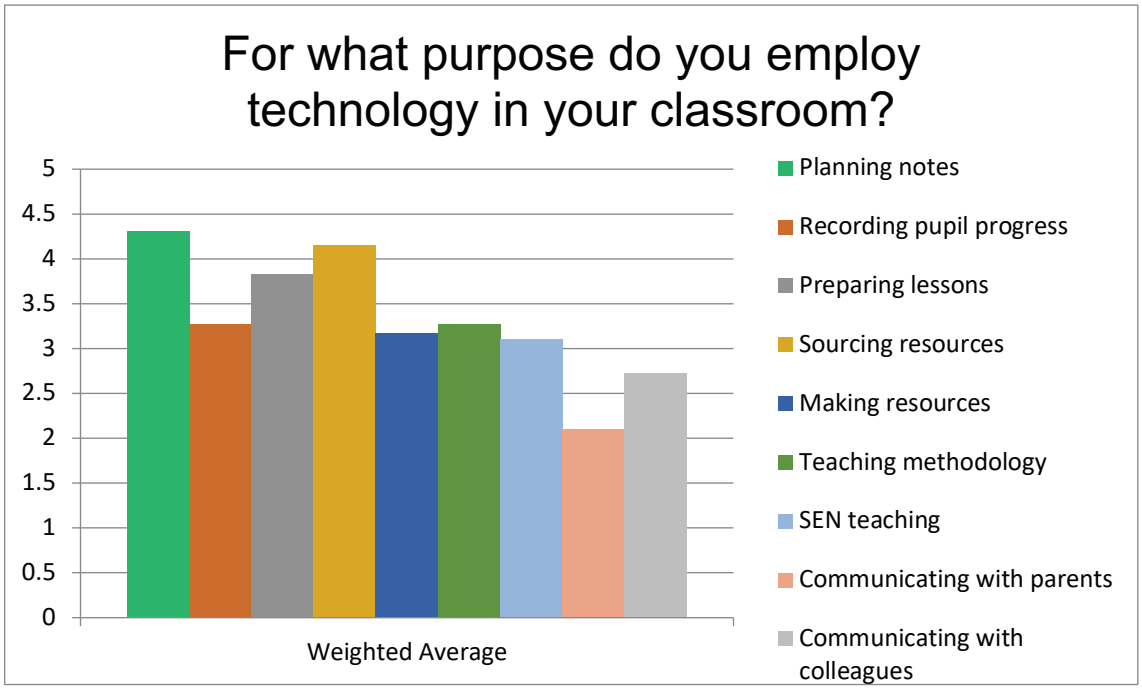
In the focus groups, principal teachers considered the type of continuous professional development (CPD) that they would value in using ICT. Some participants in the focus groups suggested that CPD in ICT depended on the teachers' own interest and level of competence. Some principals noted that confidence in using ICT was an issue as pupils themselves are considered digitally literate.

One principal made the point that 'teachers are either fully proficient in ICT or at the other extreme they have very little confidence'. Therefore, there was a proposal that all teachers should be offered system-wide, substitutable CPD opportunities in an attempt to bridge the gap in ICT competency. One principal stated that 'CPD must be provided for whole-

staff yet cater for different abilities'. There was widespread agreement for CPD opportunities that supported teachers in integrating ICT across all areas of the curriculum and one teacher pointed out 'we do not have the time to teach ICT in isolation as a stand-alone subject'. Some principals suggested that CPD should be provided in using administrative systems, such as *Aladdin*, as well as professional development for pedagogical support.

Teaching and Learning

The survey revealed that teachers currently use ICT in classrooms in a range of ways. Respondents indicated that they were most likely to use ICT for the purpose of planning (63%) and for the purpose of sourcing digital resources (49%). Fewer teachers tend to use ICT for communicating with parents (5%) or for collaborating with colleagues (10%).



Teachers were asked to recommend the digital tools and resources that they would rate most highly and use most frequently. There was a vast range of suggestions regarding the most commonly referred to resources. The websites teachers favoured most included *scoilnet.ie*; *TES.co.uk*; *ixl.com*; *twinkl.com*; *topmarks.co.uk*; *Starfall.com*; *teachingmoney.co.uk*; *resources.woodlands.kent.sch.uk; buanacainte.ie; sherston.com; askowls.com; seomranga.ie; ncca.ie* and *pdst.ie*. Teachers also highly recommended various software programmes such as *Aladdin* and game-based learning platforms such as *Kahoot* and *Khan Academy*.

Participants of the focus groups considered how ICT should be included in teaching and learning. Most principals agreed that ICT should be integrated across the curriculum

rather than be a standalone subject. The current curriculum overload was cited as the key barrier to implementing ICT effectively across the curriculum. One principal teacher questioned the feasibility and appropriateness of the proposals to introduce coding in primary schools: 'there is no space to include another subject. In any case, many pupils have over-exposure to screen time'. Some principals also expressed concern that there was an over-reliance on digital devices as a teaching approach. One principal suggested that 'every teacher should be able to function without technology such as an interactive whiteboard'. Another proposed that 'technology should be used to support teaching rather than used solely to teach'.

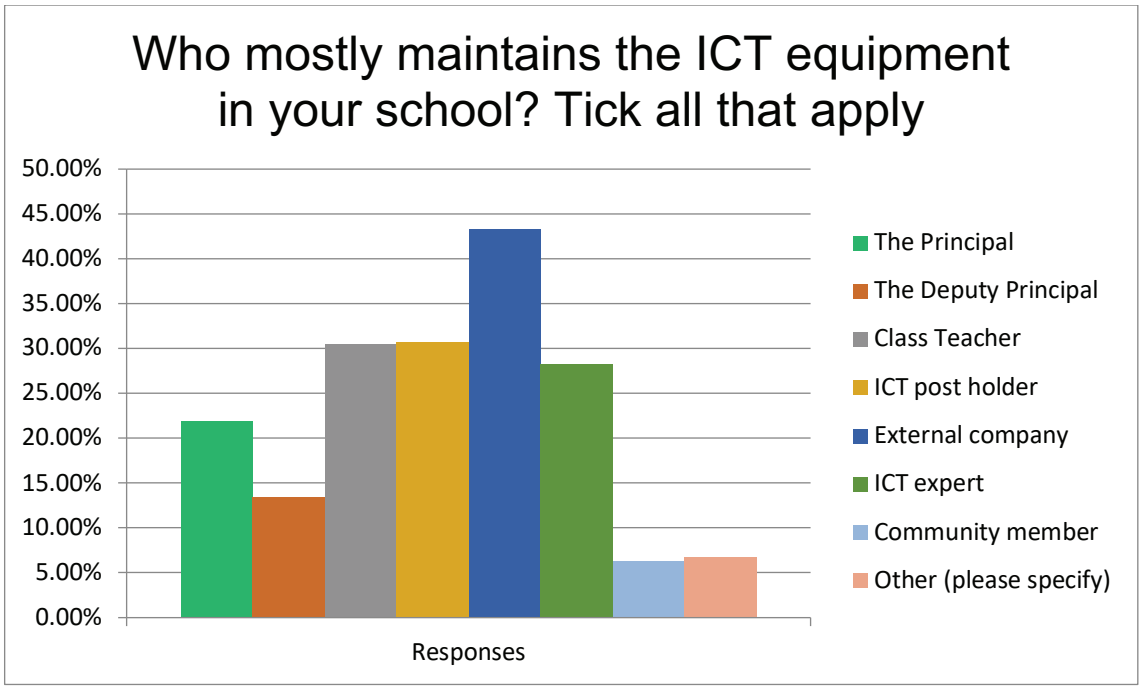
One group discussed the concept of a 'STEM Champion' as set out in the STEM Report (DES, 2016). There was no consensus on the merits of this concept - some principals believed that rewarding teachers on the basis of their expertise in science, maths and technology would create a culture of competitiveness amongst teachers rather than nurturing a more desirable, collaborative approach to teaching and learning. Others argued that schools should not engage in the concept of 'STEM Champion' until there was full restoration of posts of responsibility. Moreover, one principal teacher stated that 'rewarding teachers in particular subject areas and not others may lead to the marginalisation of subjects'.

Some schools recruited external ICT tutors to teach ICT skills to pupils. The group discussed how the tutors bring their own digital devices, such as iPads and laptops, to the school in order to address the issue of digital resource shortage. In addition, it was noted that these tutors brought a wealth of experience and expertise in using ICT with children. Some principals expressed concern that these external tutors may not put the same emphasis on the educational purpose of ICT.

Some of the focus groups considered digital teaching resources. Several principals recommended an app called *See-Saw* which allows the school to upload pictures of pupils and their work at school and to then share the photo with parents. One principal teacher of a special school said it 'works particularly well in our school as some of our pupils don't share their school news with their parents so it is an effortless way of communicating with parents'.

ICT Maintenance

The majority of respondents (43%) indicated that they have their ICT equipment maintained by an external company. Responsibility for the maintenance of ICT in schools was also assigned to class teachers (30%) or to an ICT co-ordinator (31%). Some 22% of respondents indicated that the school principal looks after ICT equipment.



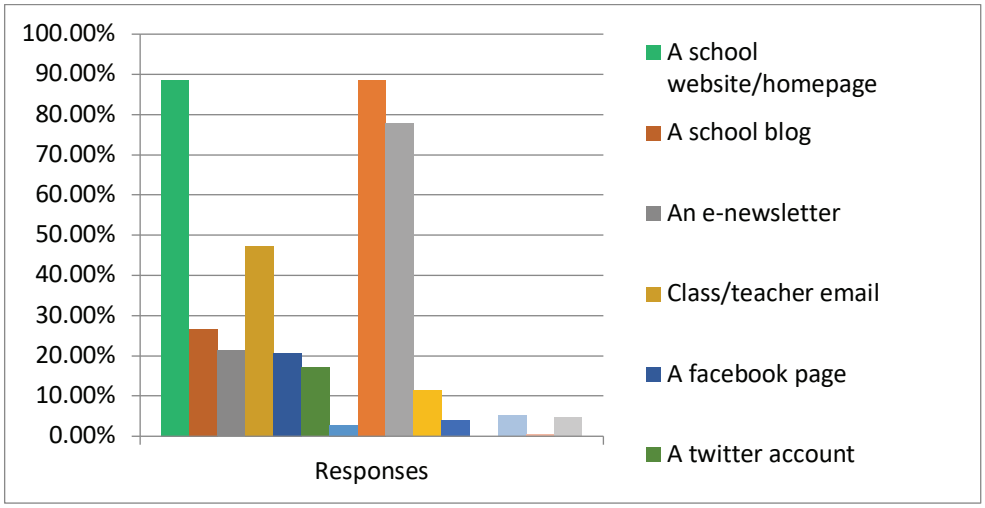
In the focus groups, principals advised that they employed a mixture of internal and external personnel to provide technical support and maintenance. Many principals said that they had invested in private companies to take responsibility for technical support and maintenance. Some principals suggested that there should be system-wide technical support provided to schools in a clustering arrangement. A teaching principal from a three-teacher school advised that 'building a relationship with an IT company has transformed the use of ICT in our school as you have access to professional support and advice'. One principal pointed out that 'teachers and principals are not technology technicians' and another warned that 'precious teaching and learning time is lost as a consequence of technical issues'. Principals also advised that it is very challenging to keep technology current as it 'becomes obsolete very quickly'.

Using ICT for Communication

Survey respondents were asked to consider how their school employed ICT at a whole-school level. The vast majority of participants signalled that their school used text-a-parent (n=2,102), a school website (n = 2,102) and school administration software (n=1,848). Smaller numbers were using a school blog (27%) and a class email (47%) to

communicate. Respondents reported that their schools used a variety of social media platforms including *Facebook* (21%), *Twitter* (17%) and *Instagram* (3%). Within classrooms teachers are using virtual learning environments (11%) and e-portfolios (4%) to support learning and assessment. The survey did not capture responses from any teacher in a school participating in e-twinning although there are 1,316 primary and post-primary schools in Ireland currently involved in the e-twinning project.

Does your school use any of the following? Tick all that apply:

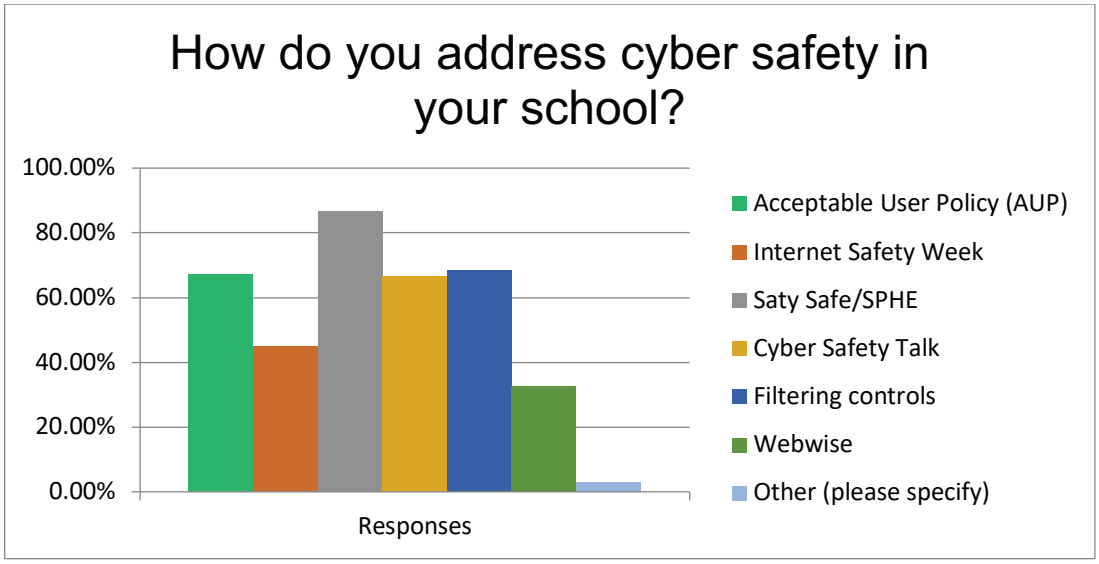


During the focus groups, principals discussed the various ways they employ technology to communicate in schools. There was unanimous agreement in one group that text-a-parent has improved communication with parents. A principal of a large 19 teacher school advised that their school used a '*WhatsApp*' text group to communicate with staff members and that it worked very effectively: 'the day of the staffroom notice board as a means of communication is over'. One principal commented that the teachers in his school have shared access to ICT folders where they upload information and resources. One principal commented that 'some parents are more likely to engage with the school using technology'. Some principals advised that schools must exercise caution with some social media platforms, such as *Facebook*, as privacy issues and inappropriate comments can emerge. One principal cautioned that 'we have a duty of care to our teachers also to ensure that they are not exposed online'.

Most of the principals represented at the discussion groups recommended using *Aladdin* or a similar administrative software package. Several principals proposed that it would be very useful if school secretaries had access to ICT professional development as they are often left to navigate the increasing use of technology in school administration.

Cyber Safety

The respondents of the survey were asked to highlight the precautions taken in their respective schools to ensure online safety. The majority of participants addressed cyber safety through SPHE. Teachers also reported that their school endeavoured to ensure online safety by way of an Acceptable User Policy (67%), internet filtering controls (67%) and cyber safety talks (67%). Other teachers use Internet Safety Week (45%) and the *Webwise* website (33%) as a means of raising awareness of the importance of responsible online citizenship.



During the focus groups some principals cautioned that cyber-bullying and social media interactions were brought into schools and teachers had to deal with the consequences. One principal teacher commented that 'pupils need to be taught to be responsible digital citizens and made aware of measures to ensure better cyber safety'. It was reported that some schools put restrictions on the use of digital devices at certain times to ensure pupils were not over-exposed to devices. Another principal commented that 'too much "screen time" can have a negative impact on pupils' results and achievements'.

Concluding Comment

This chapter has presented the findings of the INTO survey on teachers' views and experiences of ICT in their schools and classrooms. The chapter has also outlined the views of principal teachers as expressed during three focus group discussions held as part of the Education Committee's research. There is no doubt that teachers retain a lot of enthusiasm for the use of ICT in their work, however, many barriers exist that prevent the full potential of the ICT in education being realised. The next chapter discusses the findings outlined here and makes recommendations regarding the strengthening of ICT in primary education in Ireland.

6

Conclusion and Recommendations

While technology has the potential to enrich teaching and learning, the efficacy of ICT in extending the learning experience for children will depend on a system-wide commitment to a multi-annual budget, technical support for schools, CPD for teachers, enhanced connectivity and efforts to address the infrastructural deficit. An analysis of past ICT policy documents revealed that primary teachers have embraced ICT beyond the limit of the state's investment to date. It is also likely that the rate of policy turnover has ultimately impeded the long-term vision to embed ICT in education. The haphazard approach to ICT in the past has led to continued inadequacies in the system. Without sustained investment and a commitment to a developmental approach to policy, the ambitions of integrating teaching, learning and assessment will not be realised.

It is essential, therefore, that the government learns from the failings of past policies and that the scale of the challenge to embed ICT be fully recognised which will include reigniting teacher enthusiasm, recreating a place for ICT in every primary classroom, re-educating the teaching force, maintaining and sustaining technological equipment and infrastructure in every classroom. This will require meeting the different needs of diverse groups of pupils and ensuring that each child has access to the most appropriate technology to enhance their learning experience. This will require engaging in discussion with teachers to learn what supports they require. This will demand much more research on the manner in which teachers are using technology today.

The INTO research findings indicated that principals and teachers are positively disposed towards the increased integration of modern technologies and are aware of the benefits that accrue in terms of teaching and learning. Most significantly it emerged that pupils are more engaged and motivated when ICT is used as a teaching tool. ICT is a key lever for more effective learning and for reducing barriers to education, in particular social barriers. Regrettably, teachers indicated that they are most likely to use technology for the purpose of planning rather than teaching as the demands for bureaucratic paperwork have taken away from the core business of teaching and learning.

While teachers indicated improved connectivity and increased access to technological devices significant deficiencies remain in the system. Particularly, teachers and principals identified the need for a system-wide, co-ordinated approach to technical support to ensure current technological infrastructure and resources are improved and sustained over a prolonged period of time. The primary priority for teachers is their pedagogical function and this must not be compromised by demands to maintain, repair and upgrade technology. Schools are addressing the issue of technical support on an individual basis which may not be sustainable and does not ensure system-wide consistency in the long run.

How ICT will evolve and continue to impact on schools, teachers and pupils remains an open question. A coherent and cross-agency vision for integrating ICT across teaching and learning is still lacking. ICT has the potential to support and promote the type of learning outlined in the *Primary School Curriculum* under certain conditions – adequate hardware, software, digital content, ICT infrastructure, teacher continuing professional development and support and maintenance and technical support. The INTO has the following specific recommendations in relation to ICT in education:

Recommendations:

1. Provide primary schools with sufficient financial resources to invest in up-to-date technology infrastructure ensuring that all learning areas have access to a range of ICT equipment as well as provision for the incorporation of students' mobile devices.

2. Support schools to develop plans for the phased integration of digital resources at the earliest possible opportunity.

3. Adopt an integrated approach to procurement that takes full account of the operating costs of ICT equipment and technical support provision.

4. Prioritise the provision of high-speed broadband to **all** primary schools. All schools need a high-speed and reliable network that extends to all areas of the school. All computers should be networked facilitating access to online and locally based server resources.

5. Prioritise the re-establishment of middle management posts in primary schools to facilitate a coordinated approach to the integrated development of technology usage across the curriculum, in all classrooms, in every school.

6. Develop digital content to support the Irish primary school curriculum that meets the diverse needs of pupils in Irish primary schools.

7. Prioritise and develop a wide range of formal CPD opportunities for teachers. Recognise and support informal structures that facilitate teachers to collaborate in their professional learning.

8. Prioritise and encourage schools in the use of ICT resources and assistive technologies to facilitate the inclusion of students with SEN.

9. Support teachers to enable them to provide learning opportunities that support cross-curricular learning approaches, student-directed learning, collaborative, discovery-based learning activities.

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Part 2

Proceedings of the Consultative Conference on Education Letterkenny, November 2017

Presentations

John Boyle, President, INTO

Fáilte romhaibh uilig go léir go Leitir Ceannainn, an baile is mó sa chontae is deise in Éirinn. Tá súil agam go mbainfidh sibh triail as dóthain bí agus dí anseo ar feadh lá nó dhó. Before you go home on Sunday, I highly recommend that you sample the majestic beauty and culture of Donegal - we have Glenveagh National Park and Grianán of Aileach nearby, for example.

But over the next 24 hours we turn our attention to technology, a topic that I believe needs a lot of attention in Irish primary education.

I'd imagine that less than half of you were teaching 20 years ago when the Irish government was drawing up the much heralded IT2000 initiative. At that time I was loving my job in a DEIS Band 1 school, but was deeply concerned about the digital divide that was emerging between the schools and families that had access to technology and those that had not. So, I embarked on a mission to bridge that divide by endeavoring to replicate in our school the system they had in a "middle-class" school nearby. Within a year of begging and borrowing and literally going to the ends of the earth – I spent most evenings of my Summer holiday driving around shopping malls in California purchasing educational software packages at discount prices - ICT had a central place in our school. We even won an award from the INTO for our efforts!

The reason I tell you this story is that I know that it has been replicated in schools all over the country. Most schools have been involved in a wide variety of innovative and inspiring practices that use technology to transform teaching and learning. This is down to the enthusiasm Irish teachers have for the use of ICT. It's certainly not because of the support we have received from government since IT 2000.

We need an IT 2021, so that we can finally say that Ireland has a 21st century learning environment in all of its primary schools. The ICT infrastructure grants for primary schools since the millennium year have been totally inadequate. The overall level of the grants has been insufficient to meet the needs of schools in replacing obsolete ICT

equipment. The funding in the most recent grants equates to just 40 euro per child of which nine euro would go straight back to government in taxes. The funding failed to address key concerns of primary schools such as access to reliable high-speed broadband. It does not provide for the upgrading of equipment and also failed to provide any commitment to technical support to schools. There is no justification for funding of €22.20 per mainstream pupil in primary schools compared with €31.90 per pupil at second level.

The Department of Education and Skills can no longer pretend to support the potential of digital technologies to transform the learning experiences of students on this level of funding. We are as committed as Minister Bruton to having the best education system in the world by 2026. Without the investment, I know, you know and I reckon the Minister knows that's only a pipedream.
If government provides us with the resources we need, there are 10 ways that we can transform the system:

- We must use mobile devices and the applications they support
- We must integrate technology into our classrooms in order to cater for all learning styles
- By encouraging collaboration, pupils' interaction with their classmates and teachers will be enhanced
- By using technology, we can develop our students' digital citizenship skills. Its one thing to use mobile devices, it's a completely different thing to know how to use them correctly and responsibly.
- Integrating technology helps students to stay engaged. It's logical to align today's classrooms with the way that students want and are used to learning.
- Combining new tech like Virtual Reality with traditional classroom instruction can enhance learning experiences and create new opportunities.
- Students can access the most up to date information quicker than ever before.
- Teachers become encouragers, advisers and coaches with technology in their classrooms.
- Technology helps students to be more responsible.
- Technology helps students to be more creative and more connected.

Go raibh maith agaibh

Ger Stack, Cathaoirleach, Education Committee

A Chairde agus a Chomhmhúinteoirí, I would also like to add a few words of welcome to our guests and delegates here today. On behalf of the Education Committee, we are delighted and heartened by the numbers of teachers that take the time to attend this conference and to contribute to professional debate.

The INTO Education Committee was set up to advise the CEC on educational matters. Its members are the President, Vice President and one representative elected by the members of each of the 16 districts. The general aims of the Education Committee include:

- To be the leading voice in education policy development
- To be to the fore in progressing education issues
- To be aware of broader developments in Education

In addition, the Education Committee prepare research for presentation at the annual Consultative Conference on Education. Over the last number of years, topics that have been considered by the Education Committee have included: Quality in Education; Literacy; Numeracy; Wellbeing; Learning Communities and Curriculum. Last year, the historic year 2016, we took the opportunity to look at 100 years of teaching - Teaching in the 21st Century.

The Education Committee is a great committee to be involved with. We have regular opportunities to have robust discussions on education policy, to carry out research and to write and present reports.

This year the theme of the conference is ICT in Education: Policy, Practice and Pedagogy. Delegates will have received a copy of the discussion document in their packs and we hope this document will stimulate discussion and provide a background to our deliberations at the conference. This document considers some of the many practices that are happening at whole-school and classroom level in pursuit of enhanced learning experiences for pupils. The findings of the INTO research project on the use of ICT in schools are included in the document and the feedback will inform INTO policy in relation to ICT in education. Recent key developments in Government policy in relation to ICT include the Digital Schools Strategy, the STEM report, the Digital learning Framework and the ongoing work on coding by the National Council for Curriculum and Assessment. In the light of these

developments it is timely for INTO to consider the "system needs" required to support the implementation of such policies and proposals. It is vital to the success of a national policy on ICT in Education that the voice of the teacher shapes and influences future developments. We also need to challenge ourselves as a profession to prepare for the future of ICT in our schools.

I hope you enjoy the conference and that the workshops give you a good opportunity for professional learning and debate.

Tina McLaughlin, D. III, INTO Education Committee

My name is Tina McLaughlin and I am the INTO District 3 Education Committee Representative. It is a great honour to welcome you all this afternoon to my hometown.

Myself and Pat Collins, INTO Education Committee District 4 representative, will walk you through some of the findings of INTO research on the use of ICT in the classroom. Myself and technology are not the best of friends and so far this week I have managed to smash the screen of my school laptop. So bear with me, as I promise not to touch anything or break anything.

In advance of today's conference, the INTO consulted with its members to determine teachers' perceptions on the use of ICT in primary schools in Ireland. It is anticipated that the feedback elicited from this research will inform future INTO policy in relation to ICT in education.

This project adopted a mixed method approach.

- Teachers participating in the INTO online summer courses were requested to complete a self-report survey as part fulfilment of a module assignment. The survey was compiled using Survey Monkey and involved multiple choice and Likert scale items. These findings must be interpreted with a degree of caution. The sample was a convenience sample and may be unrepresentative of all teachers.
- The INTO also held focus groups with principals attending the INTO School Leadership summer course. There were three focus groups in total – each containing six to eight principals. The findings are presented according to the key themes that emerged.

The findings were broadly representative of demographics and schools in Ireland. As you can see, 55% defined their role as a mainstream classroom teacher, 5% were teaching principals whilst 4% were administrative principals. Teachers from each class level were represented and both multi-grade and single stream teachers responded.

In terms of gender, 86% of the respondents were female and 14% were male. More than a third of teachers who participated in this study had 10-20 years of teaching experience. Only 12% had 20 – 30 years whilst 10% had been teaching for over 30 years.

Now I'm not sure about your experience as a child at school, but I certainly remember the highlight of our school week was when the television was wheeled into the classroom. Thankfully we've come a long way since this.

When asked about access to ICT in their classroom, responses varied. Some 80% reported that they always had access to a teaching technology device, 63% have access to a digital projector, less than 5% indicated that students have direct access to an individual computing device in class and 42% reported that their students have access to shared devices. Of the children with Special Educational Needs, only 21% and 20% had access to a dedicated computing device and assistive technology, respectively.

The following key barriers were identified.

- insufficient access to ICT devices
- pressure to 'cover the curriculum'
- insufficient access to high quality broadband.

The benefits of faster broadband included reduced uploading delays, better classroom management and more engagement from the pupils. In total, 71% of teachers have access to a wired internet connection and almost 78% are connected with WiFi.

Only 9% of respondents rated their school broadband speed as excellent. A total of 30% rated their broadband speed as either fair or poor. From the focus groups, variations exist in the speed of broadband. One principal suggested that 'things were probably faster when we had dial up'. Delays in streaming content can create challenges for classroom management as pupils become impatient.

A Likert scale was used to measure teacher attitudes and beliefs towards the use of ICT in the classroom. Over half of the respondents agreed that the use of ICT increases their own motivation as a teacher. An overwhelming majority agreed that students are more motivated when using computing resources in the classroom. ICT is also seen as a useful tool in supporting children with special educational needs.

Almost half the respondents disagreed with the statement that students usually have more knowledge than them in the use of computing resources, however, the lack of technical support is a major issue. Over half agreed that there is no point in pursuing ICT unless all schools have access to technical supports.

The majority strongly disagreed that ICT in primary classrooms is a waste of time. Some participants in the focus groups suggested that CPD in ICT is ad hoc and depends on the teacher's own interest and level of competence.

The following opinions were shared … all teachers should be offered system-wide, substitutable CPD opportunities to bridge the gap in ICT competency, and 'CPD must be provided for whole-staff'.

Pat Collins, INTO Education Committee, District IV.

The survey revealed that teachers currently use ICT in the classroom in a number of ways. Respondents indicated that they were most likely to use ICT for the purposes of planning or sourcing digital resources, fewer indicated they used ICT for communicating with parents or collaborating with colleagues. Teachers were asked in the survey to name the digital tools they used most frequently or rated most highly – the 'Wordcloud' below illustrated the most common answers provided.

It is good to note that many of the websites noted are Irish.

Teachers also highly rated software programmes such as Aladdin, Khan Academy and Seesaw.

Participants in the focus groups considered how ICT should be used in teaching and learning. Most principals agreed that ICT should be integrated across the curriculum and not seen as a stand-alone subject. The current curriculum overload was cited as the key barrier to implementing ICT effectively across the curriculum. The feasibility and appropriateness of the proposals to introduce coding in primary schools were questioned. Concern was also expressed that there was an over-reliance on digital devices as a teaching approach. One principal suggested that every teacher should be able to function without technology such as an interactive whiteboard. Another proposed that technology should be used to support teaching rather than just solely to teach. Another group discussed the concept of 'STEM champion' as set out in the STEM Report, published in Ireland in 2016.

Principals believed that rewarding teachers on the basis of their expertise in Science, Maths, Technology and Engineering would create a culture of competitiveness among teachers, rather than nurturing a more desirable collaborative approach to teaching and learning. Others argued that schools should not engage in the concept of Stem champions until there was full restoration of posts of responsibility. Some schools recruit external ICT tutors to teach ICT skills to pupils. The group discussed how the tutors might bring their own digital devices such as iPads or laptops to the schools, thereby addressing the issue of digital resource shortage. In addition, it was noted that these tutors bring a wealth of experience and expertise in using ICT with children. Some principals expressed concern that these external tutors may not put the same emphasis on the educational purposes of ICT. Regarding ICT maintenance, the majority of respondents noted that they have their ICT equipment maintained by an external company. Some 22% noted that the ICT equipment is looked after by the principal. Some principals suggested that there should be a system-wide technical support available to schools in a clustering arrangement. Principals pointed out that teachers and principals are NOT technology technicians and that precious teaching and learning time is lost as a consequence of the technical issues that arise. Principals also advise that it is very challenging to keep technology current as it becomes obsolete very quickly.

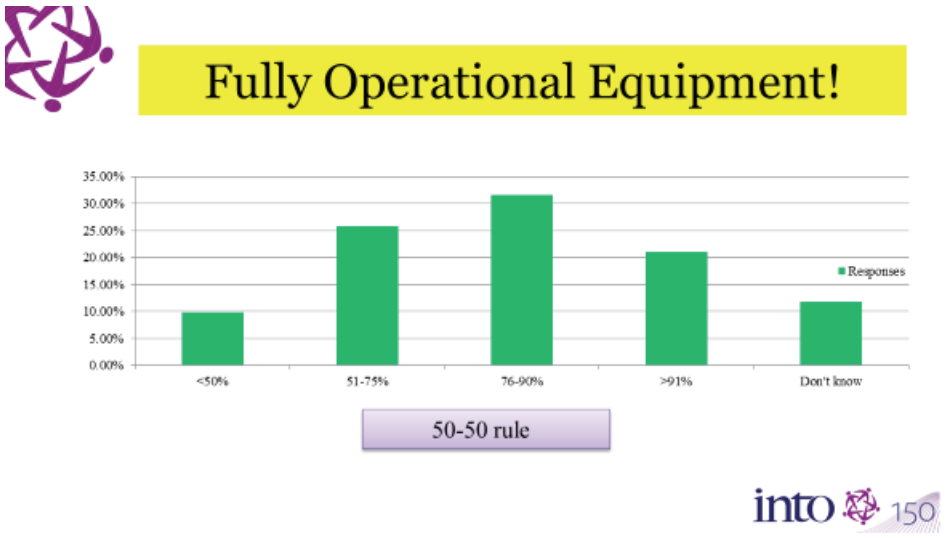
In relation to ICT for communication, the vast majority of participants indicated that their school uses 'Text-a-parent', a school website and school administration software. Smaller numbers were using a school blog and a class email to communicate. Respondents reported that their school used a variety of social media platforms including *Facebook, Twitter* and *Instagram*. Within classrooms, teachers are using virtual environments and e-portfolios to support learning and assessment. In the principals' group there was unanimous agreement that 'Text-a-parent' had improved communication with parents and it was felt that some parents are more likely to engage with the school using technology. Some principals believed that schools needed to exercise caution with some social media platforms such as *Facebook* as privacy issues and inappropriate comments can emerge. Another principal cautioned that we have a duty of care to our teachers also, to ensure that they are not exposed online.

On the topic of cyber-safety, the respondents were asked to highlight the precautions taken in their respective schools to ensure online safety. The majority of participants address cyber-safety through SPHE. There was a degree of unanimity about Acceptable Usage Policies (AUPs), digital filters and Cyber-safety talks. Other teachers used Internet

Safety Week and the *Webwise* website as a means of addressing the importance of online citizenship.

During the focus groups, some principals cautioned that cyber-bullying and social media interactions are brought into the schools and teachers are often left to deal with the fallout. It was highlighted that pupils need to be taught to be responsible digital citizens, and made aware of measures to ensure better cyber safety. It was reported that some schools put restrictions on the use of digital devices at certain times to ensure that pupils are not over-exposed. A principal commented that 'too much screen time can have a negative effect on pupil results and achievements'.

This graph illustrates the proportion of ICT equipment that is fully operational in your school. On analysing the data, I developed the 50/50 rule. At any one time, 50% of all the equipment works 50% of the time.



As teaching and learning changes, there are huge challenges facing our profession, challenges that are bigger and greater than most of us even realise. What is required is a pro-active approach from all stakeholders to ensure that schools remain vibrant, engaging and relevant places of learning for a society that is constantly evolving.

Thank you.

Deirbhile Nic Craith, Director of Education & Research

Ba mhaith liom cur leis an bhfáilte romhaibh anseo go Comhdháil Oideachais na bliana seo. Mar is léir ón méid a bhí le rá ag Pat agus Tina, tá an-suim ag múinteoirí sa teicneolaíocht, téama na bliana seo, agus is cosúil go bhfuil obair nuálaíoch ar siúl in ár gcuid seomraí ranga. Ach tá dúshláin ag baint le húsáid na teicneolaíochta - idir acmhainní, forbairt ghairmiúil, tacaíocht theicniúil agus an leathanbhanda, dar ndóigh, – ach níl aon cheist ach go dtugann an teicneolaíocht spreagadh agus inspioráid do mhúinteoirí agus do dhaltaí araon. Feicfimid roinnt den spreagadh agus den inspioráid seo i rith na comhdhála inniu.

We have come a long way in our use of technology in education. When I started teaching, technology was the spirit copier, an overhead projector with acetates agus na stiall scannáin don Ghaeilge. Technology continues to evolve – but at an ever-increasing pace. Who knows what the world of technology will look like for today's junior infants.

Policy

Reflecting global trends Ireland introduced policies and plans over the years for Technology in Education. We may have produced documents and papers but we were not quite as good at follow-through and implementation. Policies were announced, budgets were allocated, hardware bought, professional development provided - but the technology revolution remained elusive for many. However, there has been a lot of innovation in schools that were lucky enough to have a driver on the school staff. We will experience some of this innovation in our workshops later.

Vision

So what is our vision for technology in education? The INTO always took the view that ICT could enhance, enrich and extend children's learning in primary schools - but should be integrated across the curriculum and serve its underpinning pedagogical principles. ICT is a tool for learning and not a standalone subject.

The NCCA took a similar view and published ICT guidelines in 2004 to support the subject guidelines of the 1999 curriculum. This was followed by their ICT Framework in 2007.
According to the Digital Skills Strategy for Schools, which Sean will tell us more about later, the Department's vision is about enhancing teaching, learning and assessment

through the integration of technology. It's interesting to note that the rationale is to enable Ireland's young people to become engaged thinkers, active learners, knowledge constructors and global citizens. Can such a goal be achieved in today's world without technology?

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.
> (Digital Skills Strategy for School 2015-2020, p. 6)

Back in the late 1990s, the publication of IT2000 heralded a new dawn where technology in education was concerned. There was great excitement among the major players – the Department, the INTO, schools and technology companies. There was money, investment, summer courses in ICT spearheaded by the INTO and an enthusiasm to embrace technology in education. Rather than stating a vision for ICT in education, it stated objectives about putting in place a permanent infrastructure to support computer literacy for pupils, in addition to enhancing teachers' professional skills in utilising technologies. Twenty years later are we still waiting?

The vision in Smart Schools=Smart Economy (2009), a report of an Advisory Committee on ICT established by the Department, was that Ireland would have an education system that equips our young people with the critical skills to play an active role in the 21st century's economy. Not surprisingly, given the title of the report, the emphasis was on the economy. But the report identified the enabling drivers for a digital environment as a vision from the top, reliable technology in all schools, digital content that supports the curriculum and digitally literate teachers.

The European Commission's Framework on Key Competences for Lifelong Learning (2006)[1], also included digital competence defined as the confident and critical use of Information Technology for work, leisure and communication.

[1] RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 on key competences for lifelong learning (2006/962/EC)

INTO

Speaking of communication, we cannot ignore the role of social media in our lives – be that in our personal lives or in our professional lives. For the INTO, the potential of social media as a means of communicating with members has opened up new avenues but also has its challenges. The INTO explores all options presented by technology to enhance member engagement within the union. For example, all INTO delegates here today have been registered online by branch secretaries. We have *Facebook* and *Twitter* as do many branches. Our website is updated daily, we're looking into an e-version of Intouch to complement the hard copy. We have designed Apps such as the leave app that has been downloaded by 10,000 members. Our electronic newsletter is received by nearly 30,000 members. We also have some tweeting during the conference.

Teaching and Learning

Technology is part of our lives today – 24-hour banking, online shopping, remote controls, robots – but no, robot teachers have not replaced human teachers – yet!
Technology is making inroads in education too.

First, online learning has become very popular with teachers. INTO was to the fore in offering professional development courses for teachers online - greatly increasing teachers' access to professional development. We have also seen the emergence of **virtual** communities of practice where teachers share, learn and collaborate through networked technologies - often across cultural or geographical boundaries.

More recently, we are seeing proposals around digital observation of student teachers when they are on school placement. Hibernia College, in collaboration with the ESRI – Economic and Social Research Council – are piloting a process of using video recordings of teaching practice, to be used by the student for self-assessment and to be viewed by a panel of evaluators who will give feedback to the student. This idea is new in Ireland but digital observations of teachers in classrooms already takes place in the US, where Harvard University has been investigating the use of digital video to make classroom observations more helpful and fair to teachers and less burdensome for supervisors. A good idea? – that remains to be seen.

What about the pupils?

Technology facilitates enquiry-based approaches to learning where pupils have access to devices and to the internet. We know that computers, adaptive software and assistive technologies have made a huge difference to children with special educational needs. But technology in education is about more this. We are living in a digital world. We must seek to understand this world, including its darker side. Recent years have seen a lot more attention paid to cyber safety, and protection of data. But we also need to keep a critical eye on who's developing what, and for what purpose, in the world of education technology.

In the 1950s, B. F. Skinner, a Behavioural psychologist based in Harvard University, introduced a teaching machine. According to Skinner, his teaching machine allowed students to be free to move at their own pace, and only move on when they had completely mastered all the preceding material, to a final stage in which they are competent (Skinner, 1954). For Skinner, learning was about measurability, uniformity, and control of the student. It was the person who wrote the programme for the machine that did the teaching.

Adaptive learning, or personalised learning, as it is known in North America, is attractive as it allows children to learn at their own pace, and in their own time. Today's version of the teaching machine is promoted by IT companies who produce software to adapt or personalize learning for individual pupils, where the pace, place and content for each pupil is controlled. For example, *dreambox.com* or *k12.com* both claim to enhance math achievement in the US.

Our colleagues in the Alberta Teachers' Association in Canada, are critical of the adaptive learning system crusade in schools in North America, saying it is organized, growing in power and well-funded by venture capitalists and corporations, with many companies looking to profit from student (and teacher) data that can be easily collected, stored, processed, customised, analysed, and then ultimately (re)sold. In addition to the data dimension, the real issue here is who is controlling curriculum, assessment and pedagogy.

Let's have a look at the *Rocketship* project in California that came about as a way of trying to mass-produce effective schools. When children learn from their personalised software programmes far fewer teachers are needed in classrooms. Class size campaigns would be redundant! In this project, children learn in a learning lab – each child at a computer learning at his or her own pace - with one teacher for up to 100 students, supported by

one or two other adults who are 'individual learning specialists' or coaches, who are not qualified teachers, so therefore cheaper. Personalised software programmes focus on maths and reading skills based on the premise that practice leads to mastery. Arts and music don't feature here.

There is no doubt that personalised or adaptive learning supports differentiated teaching and learning, is in line with many new forms of assessment, and enables the re-imagining of school organisation. But defining personalised learning as isolated children sitting in front of a computer screen for a large part of their school day is not what we should be about.

We are living in a hyper-connected world. So flexibility offered by technology has its place, but we must remember that teaching is fundamentally about relationships.

> These adaptive learning systems (the new teaching machines) do not build more resilient, creative, entrepreneurial or empathetic citizens through their individualized, standardized, linear and mechanical software algorithms. On the contrary, they diminish the many opportunities for human relationships to flourish, which is a hallmark of high-quality learning environments. (McCrae, Alberta Teachers' Association)

At all times, we must ask ourselves whether our use of technology is supporting the aims of the Primary School Curriculum, enhancing the pedagogical principles of learning, and contributing to the holistic development of the child.

Our workshops today and tomorrow will explore the potential of technology in primary education today, showcasing innovative practices and highlighting the challenges that need to be addressed if we are to realize our vision of a digitally literate society.

Bainigí taitneamh agus tairbhe as an gComhdháil.

[1] RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 on key competences for lifelong learning
(2006/962/EC)

Skinner, B. F. (1954). "The Science of Learning and the Art of Teaching," *Harvard Educational Review, 24:2* (Spring 1954), pp. 86-97

Keynote Speaker

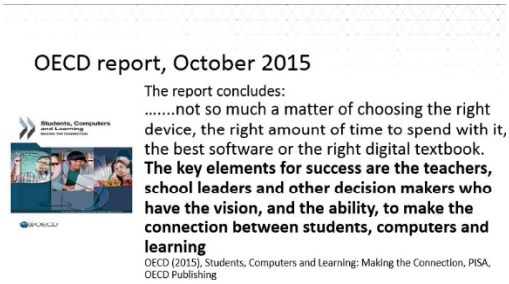
Sean Gallagher, Attymass NS.

As you may have guessed with a Gallagher name I must have Donegal roots and I'm pleased to say that that my father was born less than 20 miles away from here. But I am a proud Mayo man and there is going to be competition from here on. We've had the Donegal tourist board we are now going to have the Mayo tourist board from here on in. I'm honoured to be here as an INTO member of 27 years. I am principal of Attymass National School since 1996. I'm old enough to have been at the receiving end of one of these (blue projector) and young enough to have used one of them as well. That was resurrected in the school a few weeks ago. We were doing a clear out. Some people are probably looking at that and saying what is that? You are the young cohort.

Attymass is only 25 miles away from another scenic airport in Knock, if that tickles your fancy and we do have a rail route from Ballina. Am I one nil up or two? In Attymass school, it is certainly not Silicon Valley, and we have just over 40 kids in the school, which is a two-teacher school. Despite of being at the foothills of the Ox mountains, we are proud Mayo supporters, every last one of us. We are blessed to have space around us and we have a few laptops and other devices littered around the school. We have a teaching board that is used as much by the kids as by ourselves the teachers and we have space. We bought a few *Bee Bots* a few weeks ago as I was reading a lot about computational thinking, and I decided enough of the theory - what is it like in practice? It is great to see a workshop about it here today. We ran out of our first instalment of the grant money and we were lucky that a parent asked 'what else would you like?' and I said 'I would like a few *LegoWeDo* kits', so the parents anonymously donated them to the school. It is a pity that a parent had to do that, and yet they are deeply appreciative of the work that is being done in the school.

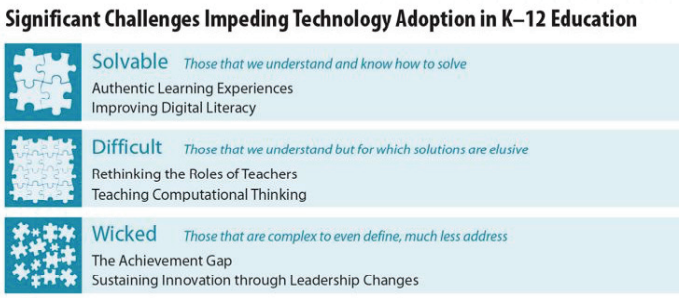
I mentioned my Donegal roots, I used to listen to my Donegal grandfather say that the family's homestead was near a place called Stumpy's Brey. I never appreciated it but in recent years I have been able to do a bit of research through the magnificent Dúchas website (dúchas.ie) to examine the school's folklore section that is now digitised for every single school in the country. A magnificent dip into the stories and customs of primary schools. I am going to mention that in my concluding slides.

If I was to summarise the key message that I want to get across today, it is that we are all lucky enough to be engaging in a professional conversation today. We are going to be immersed in the ideas of ICT in education but where are we going to get further support from, that is the challenge.



I'm going to take a look at it from a global view to a more European view and then take a look at Ireland. In terms of the global view, I think the OECD in their report of 2015 probably delivered the clearest message. It is not about the device, it is not about choosing the platform that we are going to be on or the best software or the best digital textbook. Rather, success is down to us the teachers, school leaders and the decision-makers who should be supporting us, to empower us to have the vision and ability to make the connection between students, computers and learning.

The Horizon Report, if you are interested, takes a look at future trends in education. It is released almost every year. It is almost like a gaze into the future. Sometimes it gets it right and sometimes it gets it wrong. What it sees as the accelerants of the use of technology in education at the moment is coding as a literacy and the rise of STEAM learning. I take issue with the word coding and I will address that later. STEAM learning, a lot of us are doing that already. A school in Cavan, I think it is Lacken national school, have a STEAM room. When I read it first, I had a different image but I didn't need to check the school's policies – it was clarified, science, technology, arts and maths so it was a great development and great to see teachers having the foresight. I won't go into the mid-term or the long-term trends at the moment.



Source: NMC/CoSN Horizon Report > 2017 K–12 Edition at a Glance

This (slide on significant challenges impeding) is the interesting thing in the Horizon report. The *Solvable*, what they would see as the solvable issues impacting on technology, authentic learning experiences and improving digital literacy. How are the students of the future going to navigate the electronic world unless they have a clear path of digital literacy as well as traditional literacy?

Difficult: We understand the challenge but the solutions can be problematic. It is rethinking what the role of the teacher might be. And the other difficult challenge is teaching computational thinking – what is it? Is it problem solving? Is it maths? Is it computers? It is probably elements of all three and I think the NCCA have been very good in getting that message across, but the message needs to be heard and needs to be appreciated by every teacher. Otherwise we are going to get sucked into lower-end coding activities, which is just the mere input of instructions into a computer.

The *Wicked* problems then, are the ones that we all aware of but no one has really come up with a solution and that is the achievement gap. We talk about the digital divide but we could also talk about the digital use divide. Those who are using technology effectively and those who are not using technology effectively even though they have it, but no one has come up with the ideal solution. People are moving around the edges but the only solution comes from ourselves.

Time-to-adoption - this is another part of the Horizon report – I'm not going to delve into it. If you download the Horizon Report and you want to mediate it to others, it has slides accompanying it, because there is a growing realisation that policy-makers should no longer be producing fancy pdf documents, putting them up on a website and assuming that they are going to be read and understood. They have to be taken, broken down and discussed and appreciated by everyone afterwards.

We will take a look at Europe and I have been fortunate enough to have been involved in some work on behalf of PDST. I'm just going to mention 3 reports. *DigComp 2.1*, *DigCompOrg* and *DigCompEdu*. *DigComp2.1* is just a realisation that everyone in society needs a certain level of digital competence. This has come about as in some cases banks have forced everyone to become digitally competent. We have to use a bankcard. A lot of the service companies make you either email or ring, and I don't think they want you to ring anymore because certainly the waiting time is inordinately long between the hours of 9 to 5. They are forcing everyone to go online. There are competence areas that every European citizen is expected to have and the *DigComp* report is useful to download just to see that and appreciate it. But really what we want to look at is the use of digital technology in schools, how can we plan for it, what aspects of schooling does it affect? This is where I was lucky enough to become involved, because the former NCTE that became PDST technology and education, produced the e-learning planning materials years ago. They were acknowledged as being of their time, in fact you could probably plan with them today and they would be equally effective. They fed in to the *DigCompOrg* report because ministries all round Europe were trying to plan effectively for embedding technology in education. They wanted to encourage self-reflection. The areas that the *DigCompOrg* report looks at schools under, is in what way can you use technology for leadership and governance? In what way can you use technology for teaching and learning, for professional development, assessment, for content and curricula, collaboration and networking, infrastructure and then some elements that are unique to either primary or post-primary schools. And all of you are probably saying, yes we do actually use technology in some shape or form for all of those elements of the school day or week. The *DigCompOrg* framework got a bit of a backlash from the ministries of Europe - Ireland included - because it was going to be another pdf framework. The last thing we need is just another dead pdf that we have to go trawling through ourselves. So they put their money where their mouth was and they have developed an online reflection tool to make it an awful lot easier. In other words, bring it into the online space. There is a new free online tool that the EU have developed with the joint research centre in Seville. It will help schools assess their use of digital technologies. How does it work? It is just nearing the completion of pilot phase, it is free as I said, and it is not about the technology, it is about learning in the digital age.

Who is behind it? The EU Commission are behind it, they brought in a team from all other ministries and the theory is based on the *DigCompOrg* model and already 5,000 school

leaders, teachers and students have contributed to it because the student voice cannot be lost in this either.

What does it measure? Very simply, it takes a look at the current state of affairs in your school, the changes that you want to implement and maybe where you want to get to. Who should take part? School leaders, teachers and students, realising that each have a different perspective. I might think as a school leader that we are using a lot of technology but ask a student and they mightn't be able to tell you or they mightn't appreciate it in the same way, they might have a different vision for what it might be. We have to listen.

This is how it works. I am not going to labour it. There is a school co-ordinator who creates a profile for the school online. They then log into the platform, you then have approximately 60 questions that are there already, but you can add questions to it. Then the co-ordinator generates and distributes links to the school leaders if a big school, or to teachers and to the students. I would say students from fourth class up because the language is not suitable for children below that. After they have all submitted their survey, the school gets a school report and the school report is the basis for the discussion. It is a paperless system, the data provided is anonymous and it is just a time-effective self-reflection exercise. The report is available only to the school and I am happy to say that based on the feedback that we gave in terms of getting recognition for it. The school gets a digital badge and every teacher and student that takes part gets a certificate for taking part and contributing to it so you have a record of the time that was spent in planning. If you want any details on it, it is not in full phase yet but I will make it available and I'm sure the INTO won't be shy in publicising it when it is ready.

The Digital Learning Framework for Primary Schools has come heavily influenced by a lot of these reports that are happening at global and European levels. It might look familiar in structure very clearly because it is. *Looking at our Schools 2016* was produced by the Inspectorate in 2016 and to be fair to the Department they didn't want yet another standalone framework. So really what the Digital Learning Framework is, it is like an overlay of *Looking at our School*s with specific reference to the use of technology because there was no explicit reference to the use of technology in *Looking at our Schools*. *Looking at our Schools* looks at teaching and learning domains and it looks at leadership and management domains. The same with the Digital Learning Framework 2017 but as I said, every aspect of it makes specific reference to the use of technology.

I'll talk about the Digital Learning Framework in terms of its trial in a while. Coming down the line is *DigCompEdu*. In other words what competencies might we as teachers have or how we might look at our practice in the use of technology. I'm just going to take a look at the headings and I have just done a quick brain storm on what are we doing already, what the Departing is supporting us in already and what assumptions are being made and I think that is the important one.

The first theme of *DigCompEdu* which is digital competencies for teachers, is that we appreciate data management. There is an awful lot of private information, sensitive information going around schools at the moment. There is also a huge piece of legislation General Data Protection Regulations coming in 2018 and I would say that I don't feel that I am fully prepared for it. We need to be supported in that. There was an excellent article by David Ruddy in the IPPN magazine which certainly brought me up to speed on many elements of it, but it transcends paper and electronic records. There is almost like a well-kept secret there is dataprotectionschools.ie a fantastic informative website that has been put together by the management bodies of schools and it is one that I would highly recommend. In terms of communication and professional collaboration, there are plenty of tools out there that will empower us to collaborate and communicate online. Schools should only dip into them when ready. Reflective practice is at the core of being a teacher, not just delivery mode but reflecting on our practice and there are school blogs, there are PDST technology in education good practice videos, and many schools have sought accreditation for their use because they have reflected on their practice in the Digital Schools of Distinction. And of course, there are on-line courses and Deirbhile correctly identified the INTO as one of the leaders in that and we were happy to work with the INTO in the past and PDST continues to work with the INTO and also to provide courses through teachercpd.ie.

In terms of digital resources, this is the second part as working as a teacher. What about selecting information - is there anywhere we can go as Irish teachers? Certainly, *Scoilnet* has become tighter and tighter in terms of aligning resources to our curricula. It is not just a collection of resources anymore, it has become very themed and has become very curricular-aligned over the years. In terms of organisation and sharing resources there are some fantastic sites out there and I would like to particularly mention the Clare Education site for primary teachers. There are resources there that were compiled by a great friend and colleague of mine that I dearly miss every day, David McMahon. I want to acknowledge the work that David McMahon put into that. It was his own baby and his

own alignment with what he perceived to be the needs of teachers. In terms of creating files and creating sites there is no end to the number of applications. In my rush what I forgot to do on every single slide I mentioned so far was to detail the assumptions. I am just going to start with them now. The assumptions heretofore are that every school has fast reliable broadband but that is not good enough, you have to have wireless connectivity as well. Every school has adequate access for teachers and pupils to a variety of devices and the other assumption is that we have a shared understanding of everything that we are talking about and that is part of that awareness brief that I was talking about.

In terms of digital pedagogy, what does it mean to teach in a digital environment? Is it the same as teaching 20/30 years ago? We can still instruct, use the interactive whiteboard, we can use the visualisers are they just replacing what we were using already. I think for me the digital space came into its own during storm Ophelia and we had all the live records coming in and the weather maps and that brought it to a different dimension, we weren't working from static information from topography books that might have been written two or three years ago.

In terms of teacher–learner interaction, I haven't gone near this with the kids in Attymass yet because they don't have the digital literacy skills to know the rules and conventions of good communication between me as the teacher and themselves. There is a danger that they would just see it as a sounding board, an extension of Facebook and until such time that I am happy that they have the digital literacy skills there won't be a lot of teacher–learner interaction online.

In terms of learner collaboration between peers I think that comes with time, as they need to know the rules and conventions that there is a different means of communication in the education space than there might be in the social space but the rules and convention in the social space is where learning every single day ourselves are becoming more clearly defined.

In terms of self-directed learning, yes there are some programmes out there for example, *Khan Academy*. The assumptions again, that every school has fast reliable broadband and wireless connectivity. Every teacher and pupil has access to enough devices and digital literacy skills are sufficiently developed.

Digital assessment. This is like a train coming down the tracks. Are we going to be measuring kids attainment online all the time? I would say no, otherwise we are not going to have time for teaching. The ERC in recent days have announced that the Drumcondra tests would be available online and that is a welcome development. It will be interesting to see if there is a difference in attainment between those who perform the test on a paper environment and those who perform it electronically. I'm sure there is a research paper in there somewhere. But in terms of assessments the real value in assessment is reflecting on their learning and on-going assessments as opposed to summative type assessment. Again, the assumption here is that if we have access to online testing types and we have a clear understanding of what assessment means in all its shapes and varieties.

The fifth element of *DigCompEdu* is empowering learners. Learners of all abilities, learners who have varying needs and there are a huge range of fantastic accessibility and inclusion functions. It is becoming easier to differentiate and personalise. Every teacher and home in the country has access to *World Book* online through *Scoilnet* and that makes all its materials available at 3 reading levels. There is text-to-speech as well for students who have difficulty reading. A kid should be able to access the best of information without having to depend just on *Google* and commercial search engines.

There are a huge number of projects that actively engage learners as well. The film project was attended by 700 children yesterday in the Helix. Fantastic film makers, but really what they are is fantastic creative writers, because every film started off as a genre of writing. Then it was made into a story board and then came the more technical elements at the end. They are not film makers they are writers. The *Bebras Challenge*, I don't know if any of you have been subscribers to that in recent weeks, problem-solving, a fantastic initiative started in Estonia. Irish schools now have free access and it is amazing to see the children who you might have thought had poor problem-solving ability respond to it. There is *Mind Rising*, there isn't a week that passes that there isn't some initiative that children can be immersed in a digital learning environment.

Finally, on *DigCompEdu*, facilitating learners' digital competence: this is all about our own skills and the skills of the children. But what about their information and media literacy? Many Irish students still don't know that when you look up an image on *Google* you may not be able to use that image in your project. Have you checked the usage rights? I won't ask about teachers – I did say students. And it has come home to roost because Getty images in particular has been quite aggressive in sending cease and desist notices

to Irish schools telling them that the picture on school blogs or school websites is one of their images. The cease and desist notice is not just a slap on the wrist, it is accompanied by a fairly hefty fine, so just to take care. I'm not trying to scaremonger, but good practice is good practice. And problem-solving and computational thinking that is a huge area and one that the NCCA intends to tease out and one that I look forward to being able to explore deeper.

The question I would have even on those reports is, are most teachers aware of the multi-faceted nature of this work? And if they are not, should they be? How do you think they should become aware? I know Pat and Tina did mention it in some of their slides and this is the one part of the paper, and an excellent paper it was, taken from all of us as INTO members was that one principal made the point that "teachers are either fully proficient in ICT or at the other extreme they have very little confidence". Therefore, there was a proposal that all teachers should be offered system wide, substitutional CPD opportunities in an attempt to bridge the gap in ICT competency. One principal stated that "CPD must be provided for whole-staff yet cater for different abilities." I think it nearly has to go beyond that now. Because the models of CPD favoured heretofore would be to take the school leaders out and put in a sub. Now I don't know about your counties, but there is no point in taking many of the school leaders out now because there isn't a sub to put in. Why not take us all out and go with whole-school staff training. If there are going to be clear messages developed let us all hear them from the outset, let us all work on them together from the outset instead of a trickle down.

There was widespread agreement for CPD opportunities that support teachers in integrating ICT across all areas of the curriculum and one teacher pointed out "we do not have time to teach ICT in isolation as a stand-alone subject". Some principals suggested that CPD should be provided in using administrative systems, such as Aladdin, as well as professional development for pedagogical support (ICT in Education: Policy, pedagogy and practice, A discussion paper, INTO 2017).

I would thoroughly agree with that. I'm going back to the OECD Report, October 2015 that I started with, the key elements for success are not fancy frameworks but they are great to be able to consult, but they are the school leaders and other decision-makers who collectively have the vision, and the ability, and what better way to generate the vision and the ability from the outset.

Digital Strategy for Schools 2015-2020

No more than any other strategy document that was ever put together for Irish education, it was very clear, very articulate and could not be faulted. Again, the questions I would have come in the aftermath in its implementation.

Constructivist Pedagogical Orientation underpinning the embedding of ICT in schools.

- The use of ICT in teaching, learning and assessment can enhance the learning experiences of all students.
- The use of ICT in teaching, learning and assessment is embedded in school curricula, Department policies and teacher education.
- ICT is used in an ethical and responsible way.
- ICT Planning is required to ensure ICT integration in teaching, learning and assessment.

And you probably will see that that is echoed in the European reports that I have mentioned already.

The DES Action Plan 2017 that is often cited by the Department in recent weeks and months includes the priority items. So the Digital Learning Framework that I mentioned already will be trialled in the new school year ultimately leading to its national rollout. 30 schools were lucky enough to be selected to pilot it. They will receive extensive support from my former colleagues in PDST and those schools are very lucky. If that is a pilot, will that same level of support be replicated when it comes to rollout? Or is it we tried it here and it worked in those 30 schools, and this is what you have to do yourselves – that is one question I would ask and that is one question that I would like my union be able to pose to the Department. A full suite of content and exemplars of good practice needs to be available through an online portal which should also facilitate the sharing of good practice between teachers and I have no doubt that will be of the highest quality and many of yourselves will probably feature in those good practice videos as the framework has examples of practice from a variety of schools all over the country and in different contexts.

The next part of the Action Plan that is often cited is the provision of a range of professional learning programmes for teachers and school leaders to enable them to engage effectively in whole school planning and self-evaluation to support them to embed digital technologies in teaching, learning and assessment. But what are they? What exactly is the model of professional development that is coming down the line? I would like to see a roadmap for it. I would like to see from September 2018 to June 2019 what is coming

down the line. This is what is coming for school leaders and this is what is coming for whole school staff or is everything going to be online? A bit more of a roadmap would be helpful before we could pass comment on it.

The next one, the continuing rollout of a €210 million capital investment programme backed by the dissemination of research on best practice in equipment selection, collaboration and technical support. I just want to outline a timeline here. October 2015 the Digital Strategy was launched but no money followed that year, one year passed and we reached October 2016 and it was January 2017 before we saw the first tranche of the €210 million. At that stage it would have been reasonable to expect that it would be a fairly large tranche such was the state of the equipment in schools, but we got €30 million between primary and post-primary and John made reference to the different headage payments between primary and post-primary. What's coming this year, from what I can gather, is another €30 million, so that will only be €60 million by January 2018. What's left? Another €150 million. Are we going to be in for three bonanza years of €50 million thereafter or is there a danger that there will be a new Strategy written and there will be a grovelling apology issued – I'm sorry, we thought we would have the €210 million at the time. So again, I would like to see that the €210 million is honoured and again that there would be a clear path as to when those payments will be made and how much there is going to be. The INTO could address or bring up those issues as well.

A progressive programme of high-speed broadband connectivity - to be fair that is beyond just the realm of the Department of Education, that is also down to the Department of Communication because every remote village in Ireland is dealing with this. But a key aspect of every village is the school so it should be a priority item that schools' broadband requirements are met.

Scoping out how business and industry can support schools in embedding digital technology in all aspects of their activities – again I haven't seen a clear map of how that is going to happen. How is it envisaged that business and industry will support schools? I think it is okay in a city or large areas, but what about the áiteanna iargúlta? The places like Attymass that don't have industry near them, how is industry going to support us in our digital journey? And the last one I think is being addressed by the Office for internet Safety and through the great work of *Webwise* that policies on the ethical use of the internet and online safety for young people are ongoing, so I think that is a fairly achievable one.

The scoping of an innovative clustering model across the country to innovate, harness good practice and create pathways for accelerated collaborative innovation by schools – but I would like to see again what that is going to be. It will be groups of schools coming together, but are they going to be given a grant? Or is the grant process going to be so onerous that you will almost lose the will to live? How open is it going to be? How innovative can you be? It would be good for the schools who are doing innovation and are willing.

A programme of curriculum reform will see ICT embedded in all emerging curricular specifications and intense preparation for the phased introduction of computer science as a Leaving Certificate subject option from 2018. I looked at the draft Maths curriculum during the week just to see was there reference to computational thinking in there, and the NCCA in their wisdom said "there has been much public interest in the question of the place of coding in the primary curriculum and the relationship between the wide range of coding initiative currently in primary schools and the curriculum, particularly the mathematics curriculum" because there was a feeling for a while that coding was going to be introduced under maths. The Minister asked them to investigate that and thankfully the NCCA has identified a number of approaches used internationally, including locating code within the broader curriculum, certainly within certain strands of maths and science and to see it as key skill. So I think that is a positive move and one that I would welcome from the NCCA.

The NCCA will work further with a network of schools during this school year to explore these different approaches to integrating coding in the primary curriculum. This work will help to inform the redevelopment of the primary curriculum beyond maths. If you are doing work in that I think it is very good to shape the future so rather than saying look at the curriculum they have given me and see it I can feed into the curriculum that is being developed or the thinking that is being developed.

In conclusion, I want to tell you about my own school and a situation where the kids asked to programme a *BeeBot* to go from one end of a maze to the other. They were having difficulty getting it to return back. They realised that they had to look at it from the *BeeBot* view and she had decided to give instructions and they then had to check every time. I suppose the message there is that there is something happening when the technology is switched off, not necessarily when the technology is switched on. That is the type of

learning computational thinking and authentic problem-solving can bring. It is not just focussed on the result.

So, what is my role as a teacher? I don't want to leave here with my head full - I have to have a very clear role. I would see that my role as a reflective practitioner – is what I'm doing worthwhile or is it a waste of time? Am I opening up constructive pedagogical orientation? Do I address every class and see it as an opportunity for on-going assessment? What do I want the children in my class to be? Well I want them to be active learners. In the digital world that we find ourselves I want them to be able to find and select information online, I want them to be able to critique the information and not take it as being true just because it is online. I want them to be able to manage their information. I want them to be able to create and collaborate in the online environment and I don't want them to be merely consumers of digital information. With time and when their digital literacy skills have improved I want them to reflect on learning and maybe share their reflections with others in their class. I want them to appreciate the value of on-going assessment and the long-term view that I would have is that I would love if my class could use e-portfolios where they could keep all their learning stored. They could be working in a workspace and they could show off their learning and proudly show off their learning in the showcase.
Collectively we make the Department look good and I would like that in our efforts to make the Department look good and for the holistic development of the children that they support us on our journey.

One little thing that I am doing at the moment, I said I would bring you back to dúchas.ie, this is made up by four schools that have all become part of one school. We got the transcripts and pieces of writing that came from the four schools, the stories, the folklore, we printed them off, we sent them off to the community and we have asked for people in the community to volunteer themselves would they tell us stories for our new 2017/18 Dúchas. But we won't be handwriting them, we won't even be typing them, we will make them available as sound recordings or video recordings. So this next version will be in the digital environment and hopefully it will be there for others to cherish as well. It can be uploaded to a beautiful site that *Scoilnet* have created called *Threads* which empowers us all to connect local stories and that is the interface there. Very simple to use. Why are we doing it? Well everyone has a story to tell and not just the pupils who were there in the school year 1937. Every school year has a story and it is authentic learning in the digital learning space.

Introduction to Digital Schools

Ciara Reilly, PDST

I'm delighted to join you now to kick off a discussion on the process of applying for, and being granted, the Digital School of Distinction award. I'm sure many of you are familiar with aspects and elements of the award – and indeed many of you are probably working in schools where you have already achieved this award.

Teachers often find it instructive to hear from others about their experience on applying for a process such as this – and by lifting the veil on some of the more complicated elements of it, it would encourage others to apply for it down the road. So before we hear from the three principals whose schools have successfully achieved this award, I'm going to outline the process involved in applying for the award. Hopefully you will be enthused enough to give it a go in your own school when you head back next week (amongst all the other challenges that we have to face!).

The following is based on my own experience of applying for the award in my school. There are three steps involved in the process when applying for recognition as a Digital School of Distinction.

Step one is very simple: you just create a school profile on the DSoD programme website. Here you will store information involved in a self-evaluation process.

Step two is a staged self-evaluation process. The Digital Schools programme lays down five criteria where schools have to achieve particular things in order to be granted the award. I am going to look at them in detail but for now what you need to know is that each school is asked to self-evaluate on progress against the five criteria listed below.

1. Leadership and vision
2. ICT in the curriculum
3. School ICT culture
4. Professional development
5. Resources and infrastructure

This information is added to your profile. It can be added to incrementally, and all information is retained on your school profile. Conveniently, you can continually return to it, and each extra piece of information remains attached to your profile. This is particularly useful when you are amending or adjusting your profile.

Step three is the validation visit. Once you are completely satisfied with the school's electronic profile, you request a visit from a validator to visit your school. Validators – who are approved by the Department – meet the principal, visit classrooms, and assess the school's submission for themselves. The visit in my experience can take one to two hours. Afterwards, the validator completes a school validation report which is sent to the Digital Schools Committee for review and adjudication. If you are successful at that point you are immediately granted the award but if it is deemed that there is more work to do you are given feedback. This is done in a very positive way in my experience, outlining what progress you could make, giving you a bit of support and guidance etc., and I would have the utmost confidence that if you were to reapply and address any issues brought up that you would be validated at that later stage. You would be given a new programme validator if you reapplied for the process.

Having looked at the process itself, let's take a step back and look at the five criteria which are part of step two of the process where you self-assess.

1. Leadership and vision

'Digital Schools of Distinction will have an ICT Strategy, and a positive attitude towards ICT'.

In my experience what the validators are looking for here is evidence that your school's use of ICT isn't just a veneer, but that on a substantial level you are using technology to make a meaningful impact on teaching and learning in your school – from school planning and administration to the classroom itself. In my experience the validator would want to see examples of how the teachers are being championed for the meaningful use of technology in their classroom and they might want to have a look at your school plan to see are you planning accordingly for this in all rooms. I would advise that management really step forward on this and give examples in their own experience of how they use technology to enhance their own management and leadership skills within the school. It sounds very intimidating, but in my experience, validators are very aware of the realities of school life and they won't mark you down in this area if your resources are limited. It is

much more important to champion effective use of the limited resources that you have and how you are getting the most out of that.

2. ICT in the curriculum

'Schools will integrate ICT across the curriculum. Staff will demonstrate a clear understanding of how ICT can be used to improve learning'.

Here you have to look at how you are using ICT to enhance the learning in your classroom. Inspectors will be looking at how your school uses technology, perhaps to differentiate individual needs of students. This is your opportunity to highlight the amazing work that your school is doing in the SEN field – from my experience, sometimes the most creative of users of ICT in our schools are those who work with special needs students. You may want to emphasise to staff at this stage that inspectors will be looking for the practical element, and how ICT is used in every subject from top to bottom – from the planning process through to implementation and assessment.

3. School ICT culture

Schools will demonstrate an awareness that ICT affects the quality of learning and teaching, pupil attitudes and behaviour, and the school community'.

This criteria looks at how widespread and profound the use of ICT is in your school. Here you will want to emphasise how ICT permeates every aspect of your school life – and I guarantee you, you'll have a lot more to contribute to this area than you think, so don't be intimidated! Consider what ICT tools you use to communicate with parents and the wider community. Do your own teachers have some sort of mechanism to communicate with each other digitally or electronically – and do you share notes and resources digitally? If so, how? Also pay attention to whoever is in charge of your school blog and/or website, or any social media presence, and how regularly it is maintained. It may be helpful to check out some of the amazing resources that PDST have online particularly the eLearning roadmap concept of your school moving through a culture of good practice and effective use of ICT.

4. Professional development

Schools will demonstrate a commitment to ongoing professional development in ICT, informing teachers of courses in professional development, as well as offering general support.

Again, I would be quite confident that your school would have no issue in quickly fulfilling all the demands of this area – if anything, this is an area that you can champion your

teachers and highlight the great work that they are doing. Here you can document different ICT courses that staff have undertaken during the summer break or even during term-time, or CPD and networking events they have participated at. Don't forget to include any online courses or any online professional learning networks that your teachers are associated with – maybe they have active Twitter profiles, or do particular activities with local groups that complement the work that you are doing. Always reach out to your local education centre and use your partners – remember all of the great courses that are available to you for free because of the great work that the likes of the PDST do in the local education centres. Remind your staff that that is always an opportunity that is available to them.

5. Resources and infrastructure

Schools will have appropriate ICT resources, including hardware, software and infrastructure to support particular learning environments, and reflect plans for ICT development as outlined in the school's policy.

This criteria can be the highest hurdle to jump in my experience – nobody will need reminding how concerns about infrastructure, from broadband to maintenance, remain a constant headache. But I can't stress enough: this isn't about being exceptionally well-resourced, but more about how you use what you have effectively giving its optimum and most effective use. The 400+ schools that have already achieved Digital Schools of Distinction status probably don't have that much more that you. Take faith in that, and know that you can get good use out of what you already have.

Here you may consider the interactive tools you use in the classroom and what off-line tools you might use to help you when the broadband fails as it does too often. How do you maintain or update your technology and look at the planning section of the PDST website in this area? There is a plethora of information about maintaining ICT resources and how to invest wisely when you do have finances made available to you to invest in this area.

Digital Schools of Distinction

Paul Moroney, Scartaglen NS, Killarney, Co Kerry

Just over two years ago we decided that we wanted to improve how we used technology in our school. Every school is different and I'm sure there is no one size fits all when it comes to ICT but this is the approach we took in Scartaglen National School.

Our school is situated in a rural area, we have 115 pupils in 4 mainstream classes. We have two Special Education Teachers. Like most schools in Ireland today, we have Interactive Whiteboards in each classroom. We also have a computer room, but it was not being used very often. Our broadband speed varies between 3 – 6 mbps. I did have a visit in September 2016 from an engineer who promised me 12 – 15 Mbps broadband. He was from a new provider which had agreed to supply high speed broadband for the Department of Education. Unfortunately, when he climbed onto the roof of the school, he said the milking parlour on the farm behind the school was causing an obstruction - that was the end of our high-speed broadband dreams! Like most schools in rural Ireland we make the best of what we have.

In September 2015, the staff, parents and Board of Management began the process of improving how we use ICT in our school. These are the steps we decided to take, moving from the initial planning process right up to the Digital School validation visit and beyond into the future. We began the process with careful planning of what we hoped to achieve. We used the E-learning roadmap to assess our strengthsand weaknesses as well as a guide of potential targets for progress. We drafted a new ICT policy and an Acceptable Use Policy (AUP). We found the AUP generator on *Webwise.ie* very useful. We also ensured that we had permission of every parent in the school to display photos and children's work on a school website which we hoped to develop.

The next step we took was addressing hardware and infrastructure. We had a computer room but many of the computers were not working properly or could not connect to the internet. We fixed these issues as well as installing a shared drive on the school network. This means that every student in the school has their own folder and can access it from any computer in the school. They can work on a document, *PowerPoint* or *Scratch* project on one computer and resume their work another day on any computer in the school. It also allows staff members to share documents, resources and IEPs easily. We set up Wi-Fi in all areas of the school and installed a new photocopier/ scanner/printer which is connected to every device in the school.

With the help of our Parent's Council, we purchased a set of 8 iPads and a carry case. We chose iPads because we felt there was a great selection of educational apps available. It also allowed us to set the iPads up on a device management system called *ZuluDesk*. We use this system to manage all of the iPads from one computer. Apps and updates can be installed, screen layouts can be changed, it allows you to control which apps can be opened as well as monitoring whatapps are being used. From a security point of view, the management system will give you a GPS location of each iPad and lock or wipe the device remotely if necessary. Any new devices purchased can be added to the system.

With the hardware issues addressed and new devices purchased, we turned our attentions to Teaching and Learning and how we could develop a school ICT culture. Professional development with the PDST was organised for the staff. The ICT tutor came to our school with a set of iPads for a full day where he modelled lessons in the classrooms, met with the Special Education team and provided staff training during our Croke Park time. He provided us with lots of new ideas and methodologies to try out in our classrooms.

Some of the websites, programmes and apps we frequently use in our school include *Scratch, news2day, Seesaw, Kidblog, Padlet, Fís, Skype, PDST, Aladdin* and *Geoguessr*. We have organised a number of Mystery Skype calls with other schools. Each school has to guess where the other school is located by asking a series of questions. The students can only answer yes or no. We even had a Mystery Skype with a school in Dubai. It was a wonderful experience for the children, and they learned a lot about life in the United Arab Emirates. Of these resources, there are two in particular that have had the biggest impact with the children in our school. I would like to briefly share these with you. The first of these is *Padlet*. *Padlet* is a website and app that allows students to collaborate on projects in real time. It is free of charge and very easy to use. The children in 5th and 6th class have used *Padlet* to collaborate on projects for homework as well as in class. They also use it to answer the Question of the Week on RTE's *News2Day* and they recently featured on the show. The most recent *Padlet* question they were posed was "Should Children have Bank Cards?"

The second resource I would like to share with you is *Seesaw*. *Seesaw* is a wonderful app that allows students to create their own e-portfolios that are stored online. These portfolios can be added to easily and can also be shared with parents. A poster is displayed on the wall of the classroom. The student takes the iPad up to the poster and opensthe *Seesaw* app. They scan the QR code and then select their folder. The screen on the bottom right of the slide then appears and they can add a photo, video, note, drawing or link to their

portfolio. The students in 3rd, 4th, 5th and 6th class often take photos of their artwork, stories, handwriting, spelling tests and any other work they are proud of or wish to include in their portfolio. We have had examples where children have uploaded videos of themselves delivering their debate speeches, singing songs and playing the tin whistle. Some children have stored links to their *Prezi* presentations and their work on *Kidblog*. The children have really taken ownership of their learning and it is a wonderful form of self-assessment. Their e-portfolio can be carried with them throughout their time in the school. This year we are going to introduce *Seesaw* to Junior and Senior Infants and 1st and 2nd class. The 5th and 6th class are going to go into the junior classrooms to help them choose work and add it to their folders. *Seesaw* is completely free of charge and it has changed the way we approach self-assessment in our school.

The next area we addressed was Digital Communication. Like many schools we introduced *Aladdin* to help with administration. We designed a new monthly newsletter which is available in digital format. The biggest development in this area was the creation of our school website two years ago. We decided to include a 'Kidszone 'with links to educational websites and games and also a section called 'News from the Classrooms'. This allows each class to communicate what they have been up to this month. It is just a few sentences, but it is a nice link between school and home. We had an issue with how we gathered and shared photos of school-work and events. Often the school camera would be out of battery or the SD card would be full. USBs full of photos would be transferred onto different computers and laptops. We decided we would need to find a better solution. After some research we decided to use *Flickr*.

Flickr allows staff members to take photos or videos with their smartphone and it automatically uploads to the school *Flickr* page. Each teacher installed the *Flickr* app and entered the school login details. When they use the app to take a photo or video, they can add a description and post it to the *Flickr* account. We have posted over 1200 photos since setting up *Flickr* and we have almost 53,000 views. We display these photos on our school website along with a link to the school *Flickr* page.

The final steps were the Digital Schools validation visit and we are currently in the process of reviewing what is working well and areas we could improve upon.

Thank you very much.

Rosaleen O Haire, Killian NS, Inver, Donegal

I'm delighted to be here today. It is a little bit nerve-wracking for me as this is a huge crowd for me because our school is very small. We have 20 pupils, and I know Peter has over 800 pupils in his school and 66 staff so our experience is a little bit different because of that. I thought I would start with how we do what we do, because there are plenty of small schools out there and I knew that Ciara and Paul were both going to approach it from the digital school's point of view.

This is the way it happened for us. I have been involved in digital stuff ever since Seaghan Moriarty was there a long time ago. It is a long, long time coming and we have had great fun over the years growing into it. But it was only about two years ago that I looked into applying for digital schools because we were already a digital school in ourselves, so we felt it was the right way to go. What I would like to look at – I suppose the main thing for me was the teaching and learning so when we came to look at our school 13 years ago we decided to look at how would ICT affect teaching and learning and why would you bother having it in the school at all. It is only insofar as the ICT helps our teaching and learning that we are involved with it. Of course, we all love the new gadgets and new things that happen, it's like toys for us. But for us in school we only look at how it affects us and the pupils in the school.

Why Digital Way?
Focus on teaching and learning and bringing the world into the classroom. Being a very small classroom, we felt that the children needed to have a lot more coming in than just the two mainstream teachers who were there with learning support as well. Offering a wide variety for children that it wouldn't just be listening to one person's voice because I would have them for four years so, therefore, they needed to have a wide variety. It was vital that the pupils be active in their own learning and that they became independent learners, so they could learn independently at the speed that they needed to. People often say to me how do you manage four classes in the one room? I say I don't think of four classes very often because you may have a third class child that can read like a sixth class child so it is about looking at where the children are at and how can they move forward. That has always been our approach, the belief that ICT is critical into the future for pupils. The first thing I noticed today when I came in after the workshops that were on, and indeed during it, we had our phones out, taking pictures of the slides that are in front of you, taking pictures of the resources. After the workshop we check if we have any

messages. Our life is dictated to digitally and there is no way that it is going to go back into the box again. So our children will need for the future a way of moving forward digitally. The belief that ICT can support all aspects of school life.

For the next few minutes I would hope to bring you through those aspects. The first one is administration. Paul did mention network-sharing and the need to have it. When you go to one computer what's there can be got on another computer tomorrow or another gadget. So, some way of sharing - an external hard drive which fills our needs for most things. All our stuff is in one central place - it's networked. The pupils and staff have different folders that are shared with different permissions so obviously what some members of staff can see are different than what other members can depending on their needs coming into the school - whether they are on the staff or just coming in one day a week. There would be links with parents and local communities as Paul mentioned and the website. We use *Twitter* quite a bit and we use *Facebook*.

The next area I want to look at is assessment and again *Seesaw* is one of the apps that we have started to use and the children do love selecting the work that we put up there. So it is great when they get a chance to choose their own work which they are proud of and then they might share it with others and others can see it and their parents at home can link into it as well. Portfolios or blogs like *Kidsblog* would be linked to our website and when children do work, at the first stage they publish it and the only people who can see it are their classmates, and then I will have a look at it to monitor it and then I can publish it further and it is actually published publicly. It can link into the website and they can see their written work and stories. There is also the 100-word challenge which is a writing competition which is on weekly, where you can link into it and send in your work from your blogs and enter competitions. The fun is then that you can see other people's work from all over the world and suddenly you are reading work from New Zealand and Australia and all kinds of places and the children can also comment on the work. Obviously, you have a lot of teaching as SPHE comes in here. You can explain to them what they can say in comments and what they can't say. How the positive is going to help and the negative is not going to help. I would have them practice among themselves with the older ones commenting for the younger ones. An odd day the door would be flung open and somebody would come in from the junior room next door saying 'you forgot to comment on my work!' and they almost stand there till one of the older ones goes to the machine and comments on their work.

We also use some sites for assessment that we pay for and some that we don't. Things like *CanAcademy, Mathletics, iExcel* for English and Maths. We use them on an ongoing basis and they do give you progress reports about how the children are doing. One of them for example would be trouble spots. Up on your screen would come the trouble spots that children are having the same problem with the same topic. Then you could teach to that topic using the interactive whiteboard, rather than taking the whole class back you take back the children who need the help. Quiz style assessment is huge and a lot of our children love things like *Kahoot* where you set up quizzes on topics you have done and they can either take part individually or in groups and there is so much fun in it but there is also so much learning and the results can be downloaded and kept so you have a record of your assessment as well.

You are probably all familiar with *Scorz* online where we put in our standardised test scores and get graphs, results and comparisons and things you can make and so on. The last thing I will mention on assessment is the oral presentations. To me oral presentations are a huge part of school life and has to be looked at for the future. We had a parent meeting the other night and they were talking about how important this has been in secondary school. For the children in junior cert, oral presentation is a huge part of it and some of our parents were saying the kids here are so lucky, they go in and have already done loads of presentations at parent evenings or projects and so on. That is true and I think if we had some way of recording those and I think *Seesaw* is a great way of recording your videos and keeping a table of what you have done. I mentioned presentation there, but it is not just the children who are presenting but teachers too. I know I missed the workshop on *Scoilnet* but it is one that would be close to my own heart. In *Scoilnet* you can set out your learning paths. For example, in September I was doing Ancient China with the children and before I came in I had maybe 10 or 12 resources from *Scoilnet* lined up to use. A teacher friend said to me, I love using stuff but by the time I find them on my computer, it takes me so long and the kids are getting restless. So for me, the learning paths in Scoilnet are definitely well worth looking into as well as the World books and *news2day* that are mentioned in Paul's presentation. We share the news with the children in a child-friendly way and I would use it for listenability – how well can the children listen; do they remember things or recall what was said two minutes ago never mind two months ago. The other thing in presentation is maps, no atlas can hold what maps hold when they see the satellite images. Last week we went to Beltany stone circle near Raphoe in Donegal - it is probably 4 – 5000 years old. Before we went, we opened up the map on different iPads around the room and they went in and found Beltany and then they found

Croaghan Hill which is about five kilometres away. I asked them if they could find out how far Croaghan Hill is from Beltany and I was amazed that in seconds they had clicked buttons which you or I would be afraid to touch and they click click click click and the next thing they said it was 5.3 kilometres and they had a line on the iPad and it was all drawn. Then there were the few children who mightn't be so brave, and they were sitting looking at it and I'd say 'make sure that everyone in your group can do that'. So the learning can be passed from one child to another. This is very obvious when you go to IT.

I'll mention *Scratch* when I'm at it. We have heard of coding and scratch and programmes like that, *Bee Bots, Lego* which we saw at this conference. We had *Bee Bots* in the school in September and it was fantastic. The Education Centre here in Donegal have them, we can borrow them from the Education Centre, take them out and use them in the school for a period of time. It is amazing how the young children in the school now have no problem with right and left. No problem because physically they had the Bee Bots in their hands, or on the ground, or on the table. Last week I started them off with *code.org* so now they are on with Elsa and Frozen and they bring them to different places. They do rush in the door to say that I can't get Elsa to go to wherever and I have to go back in and see what it is. In a small school it is very individual, it is giving them the chance. Up the school, they are involved with *code.org* and it is quite advanced and then I have a couple of children who are very good with *Scratch* but I give them their head – I let them teach it. Why would I be teaching it when they are much more advanced than I am? And I asked a young man in my room to say something for the video for me about *Scratch*. He said I'm an old user of *Scratch* and I try to mentor others in the classroom to make sure that they can do it, and that is true, when something is wrong, they will go to him for help. To me that is the way it should be. None of us have all the knowledge and we allow the IT to be used by everybody.

Paul mentioned *Padlet*. I asked the children in my own room would they mind if I set up the *Padlet*. You set it up on your screen and they use gadgets and they put up what their ideas are. I asked could they put up how they use technology here in Killian NS. Immediately they began to write, and it was all black and white. Then they realised you can put in colour, or you can add photographs, so they discover learning themselves. While they are doing that, in my head I was thinking - this is also English writing and this is also reading because they can read each other's work off the board. So for me, IT has helped me see that you can open out literacy, numeracy, SPHE, SESE - all that can be opened up and used in different ways. We would use *ReTheory* and *News Eile* in our older

classroom for literacy for reading. We use it two or three times a week and the learning support teacher would come into the classroom with me and we take turns to go around and hear the child's reading. The great thing is that somebody in the room can be reading at level 10 which would be nearly adult reading age and somebody else is at reading level three and it will move them on according to their ability. We will give them comprehension questions and this is all free of charge. You don't pay for it, you sign up and use it. The sort of things we need to look for, things that we can use that are going to be useful. We would be in the learning support room for the time being if we don't have enough gadgets but in turn reading isn't always going to be from the reading book. I do tell the children in my own room about the time when I was in school that we had the reading book, and you got it in September and you went home that night you read it through and for the rest of the year you read a paragraph every day. In my room there were 34 girls and I remember it well. The class book and it was the best one, the first colour picture that I ever saw in a book at school, there were polar bears on the front of it, but the rest was black and white. I remember waiting in that room for my turn to read and it would be across the back, same order every day and by the time it came to me I knew it off by heart. I had a similar experience when I began teaching, I had a young fella come into school and he was always in trouble and he says to me, do you want to hear my reading? I thought he must have done his reading last night. He wasn't in my class at all and I said definitely. He said do you want it with the book or without, so I said without the book for sure. Of course, he had it off by heart. That was memory work, nothing at all to do with reading. But he had done the work.

In communication collaboration – *Google Docs* and *Google Slides* and *Google* in general offer us a way that we can collaborate and communicate, so that within the school this year we have signed up to *Google* education, it is free of charge but you do have to have a domain. It just means that you have to pay €15 for the year and Killian school is now our domain. It has been a huge learning curve for us in the school but the pupils just love it. I would say to my class, would you work there in threes and you're leading today John, and you setup a *Google Doc* so he would go to the machine and set one up. I should pre-empt by saying that we are in the privileged position because of small numbers of having a device or gadget for every child. They all have something to use at all times. So they set up the *Google Docs* and they are going to write a story or information. They had to write questions for math's week where they get a picture and they had to come up with the questions. They among themselves would say 'ok Conor why don't you write in red, I'll write in blue and you write in green', so they could see who did which questions but they

collaborate in the documents. Or if it was a project one person may be collecting the photographs, somebody else may be doing the writing and so forth. So they are working at different machines - it could even be at home or later on when they go to secondary school it could be a project for that.

We would have a lot of evenings where people come in and out of the school and we try to encourage people to come in and out. It is great for the children as they are getting the chance to show off!

And forever ... We are still learning! Every year there is something else and something new and something more for me to learn and for me to learn from the children as well.

Peter Creedon, St Aidan's PS, Enniscorthy, Co Wexford

A lot of what I was going to say has been said, so I will really focus on our experience of the process of the digital schools and where it has led us and where we are now.
Back in 2009, we would have had a computer suite in the school. This didn't really work - a lot of times when people went to the room there were problems. The computers weren't working, stuff wasn't closed down, things were missing, cables wear out, all kinds of stuff. That was one of the issues. The other issue was that we had an accommodation crisis and we needed the room. So we looked around for a solution and we said if we needed ICT and we were to get ICT, it would have to go into the classroom and it had to be there all day long. So we looked around and saw the iPod touches (for those people in the room that are old enough to remember them) and we introduced them and managed to wrangle Wi-Fi into some classes. We used them for a number of years very successfully and that transitioned smoothly into using iPads. We are extremely fortunate that where our school is, in Enniscorthy, we are beside the exchange and we have fabulous Wi-Fi so everything I say and everything we do is predicated on that. I realise that that is not the case for a lot of schools.

If you haven't applied yet or are thinking of applying for the digital schools of distinction award, I would really encourage you to do so. Firstly, it gave us the chance to review what we were doing. One of the areas that we were focussed on a lot on was what was happening in the classroom, but we weren't focussing on leadership and vision much at on communication and management of school and how we could use it better that way. Now we have introduced *Google Docs, Aladdin* and all that stuff that many other schools have as well.

Secondly, we found that it was an extremely affirming process to go through. When you meet with the people from Digitals Schools of Distinction, they are extremely affirming as well. They are always looking at the good stuff that you are doing. I think that is very important because I think that it is important that somebody comes and tells you what you are doing is good. From that, one of the things that we noticed was that, while we were very strong at the use of devices in our classroom and very strong at using them in the younger classrooms for reinforcing and for creating materials and using things like book creator, one of the areas we were not developing was the whole area of coding and computational thinking.

I'm here representing a large school with a staff of 66. They are not all into ICT or anything like it and they don't all go around looking up ICT manuals and looking up what the latest is in ICT. However, the other thing that we sat down to look at was the fact that we needed to introduce an element of coding but we didn't want to frighten half the staff. Half the staff think of *CoderDojo* when they think of coding and they think that they don't have that expertise. So we needed to think of something that was going to be pupil-led and was also going to be supported by the manufacturers so that there was some support there already. To do that what we did was that we looked at Bee Bots for our infants and we looked at *Lego WeDo* for our senior classes. We have only started to introduce that since September. We decided to do it in May and we approached our teachers to see if anybody was interested in doing a face-to-face summer course, and to our surprise a number of teachers said they were fed up doing the online ones. So we asked them if they would consider the PDST computational course which was on in our Education Centre and a number of them said they would. They went to the course, they came back fully enthused about it and they were telling me about Lego and I knew then that we had kind of won the race at that stage. At our Croke Park day at the start of the year they gave in-service on the course they had attended. We bought a number of kits over the summer holidays. We gave one afternoon to it and the teachers had great fun making their own creations out of the Lego and moving them and all sorts of stuff. And then we put them into classrooms. At the moment what we are saying to people is that it is all ICT. ICT is there to support the curriculum, it is not different, it is not extra. If it enhances the lesson and makes the lesson better and it makes the teaching of that lesson and the learning of that work valuable and easier, then we use it. I am going to finish up by showing you a short video of some of the things happening in the classroom with *Bee Bots* and the *Lego We Do* and there is one very important point that I want to make. The *Lego We Do* is about supporting learning. There is one clip in it and I will show you - it is an earthquake simulator. I walked into the class and yes, while the class had spent time using the app from Lego and making and creating the Lego simulator, it was part of a far broader project on earthquakes that they had been doing for two weeks. They had been researching and creating other stuff from Book Creator and all kinds of things. So it has to be remembered that it is only there as another support to learning. It is pupil-led not teacher-led.

List of Workshops

As part of the Education Conference programme, delegates were invited to sign up to and participate in three separate workshops.

The following were the workshops provided:

Workshop Title	Presenters
Teachmeet	Ciara Reilly and Maeve McCafferty
Using ICT for SEN: Learning from Special Education Teachers	Susan Duffy; Michéal Bradley; Michael Fabisiak (Little Angels School)
Literacy in a Digital Age	Damien Quinn
Webwise: Safer Internet Use in the Classroom	Denis Moynihan (PDST)
Áiseanna Teagaisc na Gaeilge	Máire Nic an Rí (COGG)
Bee Bots - Coding for children made easy	Rory Reynolds
Assistive Technology in the Classroom	Maree Farrell & Mary Harrison
LEGO WeDo - Coding in the Classroom	Maggie Green
Digital Technologies to support Assessment	Michael McNamara (PDST)
Scoilnet and Associated Resources for the Classroom	Roy Mitchell PDST