Digital Skills in the Curriculum

A Baseline Evaluation of the Digital Skills provision in Primary and Post-primary Schools

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The Education and Training Inspectorate
Empowering Improvement

Providing inspection services for:

Department of Education
Department for the Economy
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Introduction

The Department of Education, (DE) commissioned the Education and Training Inspectorate (ETI) to carry out a baseline evaluation of the digital skills provision in primary and post-primary schools. The main **objectives*** were to:

- evaluate the nature and quality of the digital skills provision within primary and post-primary schools; and

- identify effective practice and any barriers to the development of digital skills among teachers and learners.

During the academic year of 2022/23, ETI inspectors engaged with and gathered **evidence*** from visits to 32 schools; 21 primary and 11 post-primary schools. They held professional discussions with school leaders and conducted focus group meetings with learners regarding the nature of the digital skills provision within their schools. Due to ongoing industrial action by members of the teaching unions, it was not possible to observe classroom practice, including learning and teaching across the schools visited. The inspectors also met with representatives from: the Education Authority; CCEA; Initial Teacher Education (ITE) training providers; and from industry.

This report highlights key features in the delivery of the digital skills curriculum, noted through professional discussions and review of supporting documentation across the schools visited, and from engagement with other stakeholders. Key considerations for going forward are also identified, so that the digital skills provision and associated professional practice can be developed further to provide better opportunities for learners to become the confident digital citizens, workers or makers of the future.

Throughout the report where text is accompanied by an asterisk (*) this indicates that additional information can be found in Appendix 1.

Background information and policy context

Developing children and young people's digital skills to the best possible standard is of high importance for living and working in today's rapidly evolving technological landscape. The required skills range from those of basic digital literacy for everyday digital content consumption to those of a digital creator, to produce advanced digital solutions and systems, and interactive content. As highlighted in the House of Lords report: "Make or Break: The UK's Digital future" (February 2015), proficiency in using digital tools is necessary for an increasingly digitally-based workforce and more secure future employability. In a world where increasingly digitally-based social and business transactions are integral to daily life, digital literacy is critical to navigating the digital world responsibly and safely.

The Northern Ireland Executive's Draft Programme for Government (PfG) 2021 sets the following key outcome that *"our children and young people have the best start in life"* to be achieved through access to high-quality education, and that learners' are equipped with the skills to help them make the best life choices. Key to realising this outcome is the attainment of relevant skills, including the digital capabilities necessary to support current and emerging needs of the economy for sustaining competitiveness, growth and innovation.

The Department for the Economy's (DfE's) strategy to support the Northern Ireland Executive's economic vision (May 2021), aims to deliver an economy that is "*10x stronger, 10x more prosperous, 10x more resilient*". By 2030, it is estimated that 70,000 jobs in Northern Ireland will be automated. This will require transformation of existing workforce skills and the acquisition of new digital competencies, to prepare young people for the future labour market and economy in which work roles and functions require increasing levels of digital capability.

The Children and Young People's Strategy (CYPS) 2020-2030 provides the strategic framework for government departments to deliver the PfG outcomes for children and young people in Northern Ireland. A key aim of the strategy is to ensure that "*children and young people learn and achieve*." The CYPS outlines that an educational transformation programme led by DE should include the best use of technology in education.

DE is currently prioritising digital skills as an area of strategic focus within the Northern Ireland Curriculum. To facilitate this strategic work, DE has established a Digital Skills Strategic Oversight Group involving a range of key stakeholders to inform development in this important and rapidly changing area.

Currently within the Northern Ireland Curriculum (NIC), Using Information and Communications Technology (UICT) is one of the three key Cross-Curricular Skills at the core of the statutory curriculum, encompassing developmental stages from foundation stage to the end of Key Stage (KS) 3. The aim of the UICT curriculum is for children and young people to be digitally literate, to be able to express and formulate their ideas confidently within a digital medium, as set out under the associated 5 E's: Explore, Express, Exchange, Evaluate and Exhibit. To support further the delivery of a digital skills curriculum The Council for Curriculum, Examinations and Assessment (CCEA) has also developed **non-statutory guidance*.**

Summary of key findings

Whole-school vision and strategic planning

- There is variability in the extent, prioritisation and impact of schools' strategic curricular planning for the development of children and young people's digital skills, leading to some gaps in the digital skills provision, particularly in the creative and expressive digital areas.

- School leaders understand the importance of developing children and young people's digital skills but are prioritising, in the first instance, the development of teachers' skills to build their capacity to deliver a digital skills curriculum aligned better to current and emerging digital literacy needs for learners.

- Recruiting and retaining qualified staff with the appropriate expertise to deliver and support delivery across all aspects of a contemporary digital skills curriculum is a common and significant challenge across primary and post-primary schools.

Curriculum for progression

- The limited availability of specialist staff with the necessary digital expertise, and the lack of a suitable range of physical resources, is leading to an undue variance in and imbalance across the range of digital skills learning experiences being provided for children and young people.

- In the more effective practice, where the whole-school curriculum is well-designed, the statutory requirements for UICT are planned and mapped systematically, enabling progressive development of the children and young people's digital skills across the key stages.

- Generally, the broad term "digital skills" is not well enough defined and understood by school leaders and practitioners. As a result, there is an insufficient shared vision for and integration of the statutory UICT curriculum and the CCEA Digital Skills Curriculum and Qualifications Framework (DSCQF). The DSCQF is not used well enough to inform wider curriculum development and structured progression pathways for the development of learner's digital skills.

- The KS 3 cross-curricular model for the delivery of UICT is continuing to evolve to support better the varied needs of the young people and improve continuity in their development of digital skills across the key stage. More work at this stage, is needed to ensure that all young people develop the necessary pre-requisite skills in digital technology to underpin their future progression in line with contemporary skillsets.

Teacher skills, qualifications and professional learning

- As a result of the need for remote learning during the COVID-19 pandemic teachers have upskilled and are becoming more confident in using digital technology to support planning, teaching and assessment for successful learning.

- The lack of suitably qualified teachers to deliver systems software design and programming is restricting the digital skills curriculum offer in post-primary schools and potentially impacting career progression choices and opportunities for young people.

Learners' progression and digital skills development

- The children and young people who met with inspectors during the evaluation, report that they know and understand how to stay safe online and appreciate what constitutes appropriate online behaviour.

- The children and young people report that they have limited experiences in using software applications for digital art and design and digital audio: music and sound.

- The uptake of young people studying qualifications where programming is a key component remains stubbornly low.

- Due to the long-running industrial action by teaching unions, there is no system-wide data available on the UICT levels of progression or attainment of pupils in digital skills, across the key stages.

Development of digital skills for careers progression

- Overall, there is a declining uptake of digital skills-based qualifications to support progression to related employment or higher education, particularly in systems software design and programming courses. The number of females choosing to study computing and software programming courses is consistently low. More needs to be done to promote these progression pathways to meet the current and future needs of the Northern Ireland economy.

Commentary

Whole-school vision and strategic planning

Schools with a clear and shared vision for the development of children and young people's digital skills have: robust self-evaluation and school curriculum review processes; well-established teacher professional learning programmes; and strategies for sourcing additional funding beyond the school's allocated budget, in order to sustain their high quality digital skills provision.

Across the schools visited, most of the school leaders understand the importance of developing children and young people's digital skills which mirrors the findings of the Beneath the Surface Report, commissioned by the Education Authority (EA) in 2023. Schools have prioritised the development of teachers' digital skills in order to build their capacity to deliver a digital skills curriculum. EA's Education Information Solutions (EDIS) ten-year programme has almost completed the distribution of the Surface Pro7+ digital devices and the installation of high-speed broadband is at an advanced stage. While periods of remote learning due to Covid-19 and the introduction of the Surface Pro7+ digital devices in 2022/23 have prompted a focus on, and supported the development of, teachers' digital skills, going forward, it is crucial that:

- schools place appropriate emphasis on both developing teachers' digitals skills and the need for their pupils to have the necessary digital skills to support their learning and progression; and

- the system-level provision of teacher professional learning for digital technology keeps pace with a contemporary digital skills curriculum and technological change and, is aligned well to the varied development needs of teachers.

Recruiting and retaining appropriately qualified staff is a common and significant challenge across both primary and post-primary sectors. It is noteworthy that, in a small number of primary schools, there is currently no ICT co-ordinator or action plan in place to support the development of the children's digital skills. In post-primary schools, the school leaders report challenges in recruiting suitably qualified specialist teachers to deliver aspects of the digital skills curriculum, in particular, software programming to GCE AS and A level standards. Several schools also highlighted challenges in recruiting or retaining suitably qualified ICT technical support staff.
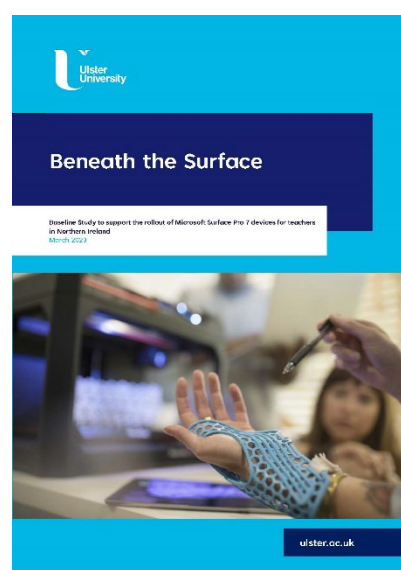
The identified variation in schools' strategic planning for delivering digital skills highlights the need for a more co-ordinated, strategic and comprehensive approach to delivering a digital skills curriculum for all learners across all schools in Northern Ireland. An overarching strategy would: plan for, and take account of, digital trends and challenges; promote more consistency across schools, by prioritising equity in access to digital resources and opportunities; and, help ensure that all children and young people have the necessary digital skills for current and future employment opportunities.

Example of effective practice

A primary school developed their action plans for UICT provision to reflect the whole school vision and ethos and aligned the use of digital technology to enhance children's learning with staff digital skills development. The school leadership team recognised the importance and relevance of developing the children's digital skills in preparation for future learning. Consequently, the school provided opportunities for teachers to regularly engage in capacity building opportunities to develop further their digital skills through a combination of: internally led staff training; training events organised through their local cluster of schools; and external training provider-led staff development programmes held in conjunction with organisations such as the Nerve Centre or AMMA Creative Learning Centre.

Curriculum for progression

The NIC for UICT affords opportunities for schools to include elements of the non-statutory desirable features for UICT and the optional elements of the DSCQF. In the better practice, schools have a clear curriculum overview which informs the mapping of coherent and steady progression in skills development across the statutory requirements for UICT, enabling the holistic development of children and young people's digital skills across the key stages. The varying levels of teacher confidence and expertise is, however, leading to undue variance and imbalance in the depth and the range of learning experiences for digital skills across some primary and post-primary schools.

Some elements of the UICT curriculum are less well-developed than others, and this is having an impact on the continuity and progression in learning for digital skills development across the key stages, particularly between KS 2 and KS 3. Often schools optimise their digital provision based on their resources, teacher expertise, staff training, external support and additional funding. The evidence from this thematic evaluation indicates that primary schools, particularly in KS 2, prioritise developing the children's coding and animation skills, however, digital skills in art and design and digital audio are underdeveloped. Consequently, schools report that, when the children transition from KS 2 to KS 3, they have varying degrees of expertise in UICT across the curriculum. It is worth noting that in the post-primary schools visited during the evaluation, often the initial focus is to ascertain the attainment level of the pupils' digital competency and address any variations across a cohort in order to level-up the young people's digital capabilities with the aim of creating a common starting point from which to develop further their digital skills.

The pace of technological change in digital device use and in hardware and software development is rapid. At post-primary level, school leaders recognise that the KS 3 curriculum plays a crucial role in shaping young people's educational pathway. Schools acknowledge the importance of providing all pupils with a coherent progression pathway

that develops their digital knowledge, skills and confidence. This will, in turn, enhance their learning experience across the curriculum and potentially increase the uptake of digital skills qualifications at KS 4 and beyond. A well-planned and resourced digital skills curriculum at KS 3 influences young people's subject choices and their career pathway. Evidence from this thematic evaluation, however, shows that pupils in KS 3, similar to their primary peers, do not have equitable access to all elements of the UICT curriculum, largely due to notable variances in teaching expertise, availability of resources and differing models of curriculum delivery between schools.

In the better practice, school curriculum planning takes account of the statutory requirements of the NIC and outlines comprehensive and progressive learner digital skills development. The skills development is then integrated and embedded across each of the KS 3 areas of learning. Some of the post-primary schools visited have reviewed their KS 3 curriculum in order to plan and co-ordinate better their ICT learning experiences and digital skills across the areas of learning. Based on their KS 3 experiences, the young people make well-informed choices in selecting their KS 4 and post-16 subject options with digital content that best meets their chosen career progression pathway.

Example of effective practice

One post-primary school recognised the need to extend their pupils' digital skills experience to facilitate further learning and progression for the world of work. At KS 3 the school reviewed their digital skills (and UICT) provision. Existing good practice was identified and used to build and develop programmes of learning to better prepare learners for transition to KS 4. Appropriate funding and resources were sourced through a wide range of collaborative links and partnerships. Programmes of teacher training and upskilling were implemented to ensure the quality of the digital skills curriculum was enhanced through the appropriate use of assistive digital technologies and enriched learning experiences. The school has introduced a range of level 2 and level 3 courses as alternative career-informed pathways at KS 4 and post-16. Consequently, uptake in IT-based courses has increased at KS 4 with around 85% of year 11 pupils studying an IT based subject.

Teacher skills, qualifications and professional learning

Based on the evaluation evidence, it is reasonable to conclude that teacher qualifications, confidence and competence in teaching digital skills varies notably across the school system. In the schools where more contemporary practice has been identified there is very often an ICT champion, or dedicated team, leading innovative practice in digital skill provision. This includes developing staff expertise in using new and emerging technology to enhance learning and facilitating the sharing of effective practice across the school. Continuous professional learning is vital for teachers to keep up-to-date with the latest technological developments to support and improve learning and teaching. Over the past three years, the incentive for, and pace of, teachers' professional development in using ICT to facilitate pupil learning has accelerated. This positive trend is most likely explained by the periods of remote learning during the Covid-19 pandemic, the roll-out of the Surface Pro7+ digital devices in all schools, and the associated staff professional learning. Further strategic work is still required in order to continue to equip all teachers with the knowledge and skills needed to optimise digital technology to transform learning and teaching at a pace that is in line with the rapidly changing digital age.

The challenges in recruiting specialist ICT teachers together with existing staff's limited confidence in teaching coding and creative technologies is impacting curriculum delivery, learner experience and their skills development. Teacher training organisations also report challenges in recruiting adequate numbers of students to the Post Graduate Certificate in Education (PGCE teaching qualification) in ICT. The recruitment and retention of qualified staff with expertise to deliver a contemporary digital skills curriculum, alongside the undersupply of specialist teachers particularly for software programming, is restricting the curriculum offer in post-primary schools, and ultimately, young people's potential career choices and progression opportunities.

Analysis of the available examination entry data from schools over the past five years shows that the number of pupils entered to study for an ICT qualification at GCSE and level 2 with digital content, has decreased by 25%, from 11,531 pupils in 2017/18 to 8,540 pupils in 2021/22. Analysis of CCEA data shows that the uptake in GCE software systems development programming has remained consistently low with 235 candidates in 2017/18 and 221 candidates in 2021/22.

Example of effective practice

A post-primary school has developed links with an IT software provider to deliver staff training and use of technology-assisted learning for their pupils. The school then uses their developed expertise to disseminate their learning and good practice to cluster groups of primary and post-primary schools in a partnership arrangement which supports the wider development of teachers' digital skills.

Learners' progression and digital skills development

The children and young people in the schools visited reported that they know and understand how to stay safe online and what constitutes appropriate online behaviour. They also spoke about their interest in using ICT and the opportunities they have to develop a range of digital skills in, for example: researching; presenting; managing data; using various 'digital applications' in school and at home; and in using **productivity software*** confidently. The children and young people also report limited experiences in using applications for digital art and design, and digital audio: music and sound.

Due to long-term industrial action by teaching unions, not all schools have submitted their UICT assessment results to CCEA for moderation. Schools do not have system-level moderated and robust attainment data for the levels of progression in digital skills. Consequently, the accuracy of the school-awarded levels of progression in UICT for each learner lacks robust quality assurance.

As a result, DE and the wider education system cannot track, monitor or quality assure children and young people's outcomes in digital skills development across the key stages.

The latest NI skills data and current government strategy outline the need for NI to boost the supply of workers with high level digital skills, particularly in programming. It is notable that two-thirds of the year 12 candidates who opted to study a GCSE or Level 2 ICT qualification in 2022 completed a vocational course which does not include software programming. Consequently, there is a much lower uptake of and progression to GCE

A level or level 3 software design and programming courses. This low uptake in computer software design and programming should be kept under review in light of the Northern Ireland labour market skills needs. Education and skills development strategies to boost uptake to meet better the labour markets needs in the digital software sector should remain a priority for DE, particularly to support the DfE's economic vision outlined in the 10x Economy NORTHERN IRELAND'S DECADE OF INNOVATION skills strategy.

Example of effective practice

In a primary school the children have access to a range of software and have a good working knowledge of a range of digital devices. They enthusiastically talk about their enjoyment in using technology in developing their digital skills across the curriculum, to research, problem solve, create and manipulate digital artwork and animations and present their work.

The children have a good understanding of online safety and on the conventions of acceptable online behaviour gained through the programmes of work and engagement with external speakers, for example the Police Service Northern Ireland. Through their roles as digital leaders the children know, and are encouraged, to act responsibly, share their expertise across the key stages and contribute to digital learning across the school.

Development of digital skills for career progression

There is currently no statutory requirement for children in the primary phase to have access to provision of career-based knowledge and information. However, in some instances, particularly in KS 2, teachers offer meaningful career-based education opportunities to the children through initiatives such as Young Enterprise NI and input from guest speakers. These valuable opportunities support the raising of the children's awareness of various career paths, including the use of digital skills in the workplace, and provide them with opportunities to develop and apply their digital skills in a wide range of contexts.

The term "*digital skills*", as outlined in the CCEA DSCQF, is not well enough understood by all schools. Leaders in the schools visited by the inspectors, report that there is a perceived disconnect between the 5E's in the NIC and the terminology of digital citizens, workers, and makers as set out in the DSCQF. In addition, there is limited awareness of the CCEA resource, Curriculum for Digital Progression Pathways that connects learning in pre-school through to post-16. Schools would benefit from clearer communication and guidance from CCEA and/or the EA to support the implementation of a more contemporary and holistic digital skills curriculum for children and young people which supports their career development.

In discussions with inspectors, pupils in KS 3 were clear about their progress in English and mathematics but less sure of their progress in digital skills. Consequently, they don't recognise easily, and are not confident that they are developing sufficiently, the skills they need to live and work as digital citizens, digital workers or digital makers. More needs to be done to ensure children and young people are clear and confident about the digital skills they are developing for living and working in a digital society.

In the better practice, schools have well-considered career progression options, providing their young people with digital skills pathways to further or higher education, work-based learning or employment. The young people also benefit from links with local industry, businesses and the colleges of further education. In around one-half of the post-primary schools visited, for example, there were opportunities for appropriate work experience placements in IT-based industries.

Examination entry data over the past three years shows that the proportion of females choosing to study courses with a significant digital technology content at level 3 remains much lower than the number of males. For example, in Digital Technology the proportion of females is 32.3% of 2193 candidates and in Systems Software Development it is 14.5% of 1058 candidates.

Example of effective practice

A post-primary school offers subject options in a broad range of digital skills related courses at both KS 4 and post-16. In this more effective practice schools have planned for learner career progression and matched different examination board qualifications and combinations with appropriate subject options to provide suitable pathways to Further or Higher Education courses, Higer Level Apprenticeships or access to work related multimedia courses.

Conclusion

Schools have laid a sound foundation for the development of children and young people's digital skills and literacy, which they have the potential to build upon. In the main, school leaders recognise the importance of digital skills: they are prioritising the development of teachers' digital skills to build capacity to provide a digital skills curriculum aligned better to the needs of children and young people to become the digital citizens, workers or makers of the future.

In schools where the whole-school curriculum is well-designed, the statutory requirements for UICT are well planned and mapped systematically, enabling progressive development of the children and young people's digital skills across the key stages. In addition, teachers' confidence in the use of online platforms to support pupils' learning, in class and remotely, has grown significantly over the past three years. Most schools are now well placed to deliver significant aspects of the curriculum remotely when required.

The children and young people report that they know and understand how to stay safe online and appreciate what constitutes appropriate online behaviour.

Overall, the variability in the extent, prioritisation and impact of strategic curricular planning for the development of children and young people's digital skills, underscores the need for a co-ordinated strategy to provide all children and young people with an equitable and relevant digital skills curriculum. This report has identified a number of key considerations that can be addressed most effectively within an overarching digital skills strategy. In the absence of a formal strategy, however, and to optimise the potential benefits of a well-resourced digital skills curriculum, DE officials should continue to work collaboratively with key stakeholders to maintain a strategic focus on and development of the digital skills provision within schools that equips learners for a life beyond the classroom, in employment or as citizens in an increasingly digitised society.

Appendix 1: Additional Information

Page 1   **objectives*** - The Terms of reference for the evaluation of the digital skills curriculum in primary and post-primary schools in Northern Ireland.

The objectives of the report are, to: evaluate the nature and quality of the digital skills provision within primary and post-primary schools, identify effective practice and any barriers to the development digital skills among staff and learners; with a focus on the extent to which the:

- whole-school vision and strategic planning enables the development of school's curricular provision for using ICT and digital skills;
- curriculum facilitates progression in the children and young people's development of their digital skills within and across key stages;
- children and young people's digital skills are developed to an appropriate standard, particularly at key transition points;
- children and young people are informed and knowledgeable about the range of digital skills required to contribute effectively to society and the economy as digital makers, workers and/or citizens.
- children and young people are informed about digital skills careers and associated progression pathways to further/higher education and/or employment; and
- skills, qualifications and professional development of teachers meet the current and emerging needs for the delivery of a digital skills curriculum.

evidence* - Members of the inspection team met with representatives from: the Education Authority; CCEA; Initial Teacher Education (ITE) training providers; and from industry, in addition to carrying out an analysis of relevant examination data.

Page 2   **non-statutory guidance*** - The Desirable Features for primary were updated by CCEA in 2019 to reflect the ongoing development and advancement of digital tools, systems and innovations. In 2020, CCEA also developed a Digital Skills Curriculum and Qualification Framework (DSCQF) that aims to "*address Digital Skills through our education system in a strategic and joined up manner*" and additional teaching resources.

Page 7   **productivity Software*** - Is any application or computer program that enables a user to produce or create, among other things, audio clips, documents, databases, graphs presentations video clips or worksheets.

Appendix 2: Evidence Base

Evidence for this evaluation was sourced through: 17 school visits; eleven online or phone meetings; and four written submissions. Inspectors engaged in 54 meetings with 68 key school leaders and staff members from across the primary and post-primary school sectors.

Learners' views and experiences in digital skills were shared during discussions with 15 pupil groups from across primary and post primary schools with a total of 135 learners.

The inspectors also met with representatives from: Northern Ireland's main teacher training Universities and colleges; The Education Authority (EA); IT Sector representatives; and analysed CCEA UICT guidance information and materials for schools related to the Northern Ireland curriculum and finally, scrutinised examination entry data and pupil attainment statistics.