Education Review Office
Te Tari Arotake Mātauranga

IT'S EARLY DAYS FOR THE NEW DIGITAL TECHNOLOGIES CURRICULUM CONTENT

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Ko te Tamaiti te Pūtake o te Kaupapa

The Child – the Heart of the Matter

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It’s early days for the new Digital Technologies curriculum content

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Background

Why Digital Technologies and Hangarau Matihiko (DT&HM)?

Digital devices and technologies are, and will continue to be, an integral part of our society and economy. Technology is shaping how we work. A recent Organisation for Economic Co-operation and Development (OECD) report[1] notes that 40 percent of jobs created between 2005 and 2016 were in digitally intensive sectors.

Our children and young people need to be prepared to work and participate in tasks increasingly needing specific technological skills, knowledge and capabilities. It is important to note that 'digital devices' are only the physical tools, such as laptops or tablets, whereas 'digital technologies' refers to interventions by design, through the creation and use of digital solutions.

The Ministry of Education (the Ministry) has strengthened the Technology learning area and Hangarau Wāhanga Ako by introducing additional technology areas for growing skills in computational thinking and designing digital outcomes. This new curriculum content is not about teaching students how to use digital devices, it is about giving them an understanding of the computer science principles and programmes that underpin the design of digital technologies. The intent is to help learners become digitally capable, not just as users of digital devices but as the creators of digital solutions.

What does this mean for schools?

The Government gazetted the Digital Technologies and Hangarau Matihiko (DT&HM) in December 2017. All schools are required to implement the new curriculum content from January 2020 for all students in Years 1-10.

Schools should integrate the curriculum content across learning areas and plan opportunities for students to develop their capability to create digital technologies for specific purposes. It is important that school leaders are clear that integration means the new technology areas are incorporated as part of their school's local curriculum.

The two new learning areas in the Technology learning area (Computational thinking for digital technologies and Designing and developing digital outcomes) have staged progress outcomes to guide teachers. The progress outcomes indicate the expected minimum achievement for students operating at different levels of the New Zealand Curriculum. There is also a clear statement of expectation that, by the end of Year 10:

[1] Organisation for Economic Co-operation and Development, 2019 *The Future of Work* OECD Employment Outlook 2019. Accessed here https://www.oecd.org/employment/outlook/

. . . students' digital technological knowledge and skills enable them to follow a predetermined process to design, develop, store, test and evaluate digital content to address a given issue. Throughout this process, students take into account immediate social and end-user considerations. They can independently decompose a computational problem into an algorithm that they use to create a program incorporating inputs, outputs, sequence, selection and iteration. They understand the role of systems in managing digital devices, security and application software, and they are able to apply file management conventions using a range of storage devices.[2]

Support for leaders and teachers is phased

The Ministry has put in place a programme of support to raise awareness of the new content. The programme provides professional learning and development (PLD) appropriate to schools' needs so leaders and teachers can gain the understanding, knowledge and skills necessary to deliver the curriculum content.

Teachers and kaiako are on a continuum of confidence when using digital devices to enhance learning, let alone planning to teach computational thinking or designing and developing digital outcomes. The Ministry's package of professional support[3] covers the range of needs. The PLD options include:

- Digital fluency — for schools to build teacher confidence using digital devices to enhance and extend learning[4]
- Kai Takitū ā-Matihiko | Digital Readiness Programme — for educators to learn about the new DT&HM content and how to deliver it
- Tailored DT&HM professional learning and support — for those with more confidence and capability, ready to integrate DT&HM into their local curriculum

Further ongoing support is available for teachers with existing high capability in this area to extend their knowledge, so they can provide expert leadership to teachers with gaps in their knowledge or capability.

[2] Accessed from http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum/Technology/Learning-area-structure#collapsible2
[3] Available at http://services.education.govt.nz/pld/dthm/digital-technologies/dt-and-hm-professional-supports/
[4] Digital fluency PLD has been available to schools since 2017.

The Ministry has asked ERO to determine what barriers and enablers have influenced schools' preparation for implementation. This evaluation will inform the Ministry of where the strengths lie in its processes and where improvements can be made. The report also alerts school leaders to the need to engage with the Digital Technologies (DT) curriculum content with the urgency required to meet the deadline for implementation.

The intended focus in 2019 and 2020 is to help schools incorporate the new technology areas into their local curriculum through their school-wide planning and classroom practice.

The approach

The Ministry has an overarching evaluation strategy for *Strengthening DT&HM content in the Curriculum.* This strategy is an iterative living document. The initial evaluation and monitoring includes ERO-led components – a survey of schools in September 2018 (ERO's 2018 CATI survey)[5] and case studies in early 2019. Both components focused on English-medium schools, using a theory of change[6] and survey questions developed with the Ministry.[7] The Ministry has separate arrangements for the evaluation of Hangarau Matihiko content in Māori-medium settings.

ERO's 2018 survey collected baseline data to obtain an overview of how prepared schools were to work with the DT curriculum content. The data informed the choice of schools visited for the second phase of the evaluation; in-depth case studies highlighting schools' different journeys towards implementation.

ERO's 2018 survey of a representative sample of schools canvassed school leaders' and teachers' awareness of the new content, effectiveness of the Ministry's early support programmes, foundational knowledge, and early implementation of the curriculum content. Each school principal selected the person deemed best placed to respond to the survey on behalf of their school.

ERO's questions were guided by the agreed Theory of Change

This early implementation evaluation is formative, focused specifically on the Ministry's communications and initial support programmes, and their overall effectiveness.
The overarching question was:

How effectively has support raised schools' awareness of, and helped them to begin working with, the DT curriculum content?

[5] Computer Aided Telephone Interview (CATI).
[6] See Figure 1.
[7] See Appendix 2.

This is a theory-led evaluation and a Theory of Change was used to guide the process. The Theory of Change is presented in a stylised, linear format for ease of understanding. ERO is well aware development and changes in a school are often more complex. Nevertheless, the Theory of Change helps clarify the inputs, activities, outputs and desired outcomes.

Awareness of the DT curriculum content, identification and participation in the support offered by the Ministry (or other sources) should all lead to changes in the professional practice of leaders and teachers.

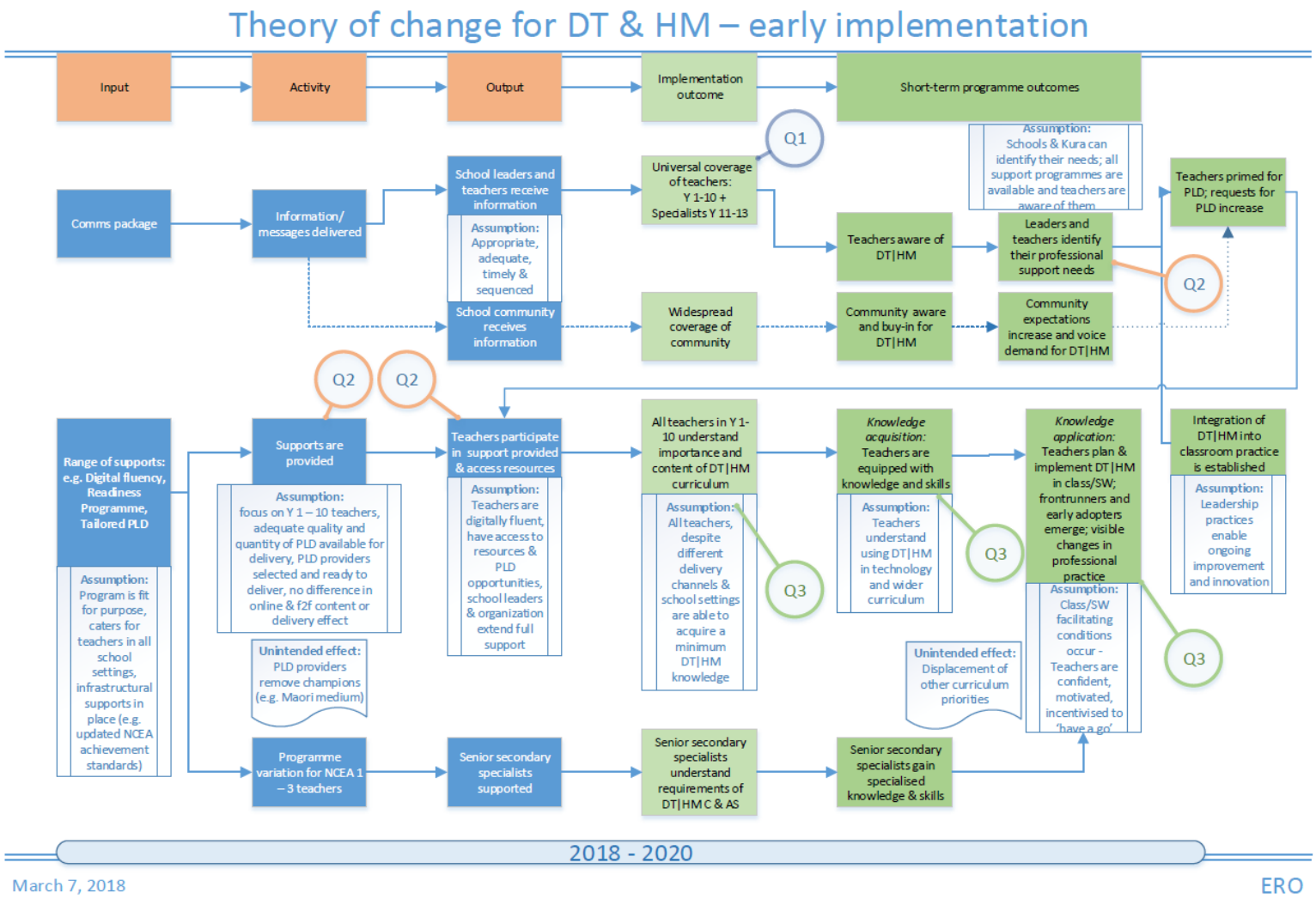
The Ministry expects Digital Technologies learning will be integrated across the curriculum. This means, for example, students might learn about the principles of programming in the context of mathematics, science or music.

Figure 1 depicts the Theory of Change for DT&HM early implementation phases relating to support programmes and includes the groups of sub-questions (1-3) marked at the appropriate stages. These questions explore the key areas of:

- awareness activities
- needs identification and participation
- implementation and short-term outcomes.

Assumptions made at various stages in the change process are also noted on the Theory of Change, and ERO tested these as a part of the evaluation.

Figure 1:The Theory of Change for DT & HM – early implementation



ERO used these sub-evaluative and investigative questions to explore the effectiveness of the Ministry's early implementation processes.

Sub-evaluative questions	Investigative questions
1. Awareness activities • To what extent did the communications raise schools' and teachers' awareness of the DT & HM curriculum package? • How fit for purpose and accessible is the information provided for schools, and Kāhui Ako? • How effective was the timing and sequencing of the communication package?	Before 2018, how much did you know of the DT & HM? Nothing A little Quite a bit A lot Do leaders and teachers know about DT & HM? Y/N What Ministry comms have you seen? List comms from package What comms were useful? How else did you find out? expand How easy is it to find out about the DT & HM? Very difficult Somewhat OK Quite easy Very easy to get all the information I need What could make it better? How has your community found out about this?
2. Identification and participation • How effectively are schools and Kāhui Ako identifying their teachers' capabilities in relation to the DT & HM? • How well are schools and Kāhui Ako identifying their specific learning needs for DT & HM? • To what extent are schools and Kāhui Ako applying for and accessing professional support appropriate to their needs? • How has the school supported teachers to participate in the DT & HM?	What are leaders doing to prepare for DT & HM? What tools, if any, help to identify teacher capabilities in DT & HM? expand What other support would be useful? How easy has it been to identify specific learning needs? Difficult Somewhat problematic Relatively straightforward Very easy What is helping? What else would help? What professional support have you applied for? Or accessed? Digital fluency Readiness programme DT & HM PLD Other – please expand If using Ministry support, is it meeting your needs so far? Not at all Some limitations Quite well A very good match To what extent are your teachers engaged with the DT & HM? Reluctant Starting to engage Engaging Enthusiastic What are the barriers/enablers?
3. Implementation and short-term outcomes • How effective is the support in meeting the schools' needs?	How well do you understand the DT & HM and how it works with the NZC? Not at all Starting to see how it fits Need a bit more Get it How much of your understanding do you attribute to Ministry sources? Please identify sources

• To what extent do leaders and teachers consider they understand the DT & HM and its place in the NZC • To what extent do teachers consider they are equipped with the knowledge and skills to implement DT & HM? • To what extent do teachers feel confident, motivated and incentivised to 'have a go'? • To what extent are leaders and teachers including DT & HM in their curriculum planning? S/W and classroom? • To what extent are there 'front runners' and 'early adopters' of the DT & HM curriculum package?	None Some Most All Other sources? Expand Do you feel you have enough knowledge and skills to implement the DT & HM? Not at all Starting Somewhat Enough How much of your knowledge and skills acquisition came through Ministry support programmes? None Some Most All Other sources? Expand How confident are your teachers to have a go? Not at all Starting Somewhat Very confident What are barriers/enablers? Expand What changed in your school and/or Kāhui Ako as a result of the implementation phase of DT & HM? Comment How much planning are you, as leaders and teachers, doing to integrate the DT & HM in the curriculum? Nothing yet SW Some SW planning Included in overall curriculum Nothing yet in classrooms Some Individual Teacher planning Teachers all planning Do you have champions in your school who are already implementing DT & HM? expand

ERO trialled these scaled, closed and open-ended questions and then put them to a randomly generated sample of schools[8] using a Computer Aided Telephone Inquiry (CATI). The school principals nominated the most appropriate person to be interviewed. In the final analysis, 53 percent of all respondents were principals, 31 percent were people with dedicated information technology expertise, and 18 percent were senior leaders in the school.[9]

The sample of schools was a 10 percent, simple random sample (+/- six percent margin of error). ERO's 2018 CATI survey elicited a response rate of 97 percent, with responses from 221 schools during September and October 2018. The results from such a sample could therefore be widely generalised to the whole school population. The survey was administered by a single person, providing consistency and reliability of data collected.

[8] See Appendix 1 for details of sample.
[9] In some cases there was an overlap of positions – hence the percentage greater than 100 percent.

Survey findings

Awareness

Most schools knew about the DT curriculum content

The Ministry communications programme has reached almost all schools. Ninety-five percent of schools had teachers or leaders who were aware of the DT curriculum content. However, only 35 percent reported that, in their school, both leaders and teachers were aware of the DT curriculum content and their obligation to implement it from January 2020.

Some only heard about DT&HM in September 2018

Several respondents felt the information was slow coming to them and could have been more direct. The brochure sent out by the Ministry in early September 2018 certainly alerted many schools and directed leaders to the DT & HM landing page and online websites. When schools had a good connection with local Ministry personnel or had a teacher with specific interest or responsibility for digital technology they were kept well informed about developments. A very few schools (five percent) reported they were unaware of the DT curriculum content until contacted by ERO for the survey.

Technology Online was identified as the most useful source of information

Several respondents commented they had to 'go looking' for information, and 'you had to know where to look' to find DT curriculum content information. The Landing Page[10] and Technology Online[11] were most commonly cited as sources of information and were found useful (see *Table 1*). Sixty percent of schools accessed both of these sources and over half of them found the Technology Online website the more useful of the two. The least effective communication sources were Twitter (only two schools) and the Education Review (one school).

[10] This is the Ministry site http://education.govt.nz/our-work/changes-in-education/digital-technologies-and-hangarau-matihiko-learning/ which has key information and links about DT&HM learning.
[11] This is the TKI site dedicated to the technology learning area http://technology.tki.org.nz/ where there is more information about the DT&HM content.

Table 1: Sources of information sighted

Ministry of Education communications	% who had seen or visited	% of 'seen' that considered this useful
DT & HM Landing page	71	35
Technology Online website	65	53
Email from the Ministry	38	11
School leaders' bulletin	29	12
Education Gazette	20	7
Connected learning advisory	9	46
Facebook	8	18
Press releases to media	5	0
# Future Thinking Today	25	N/A[12]

Schools particularly appreciated the Technology Online site as it was easy to find and provided exemplars they found very helpful. They hope for more exemplars.

While the Ministry has put forward *# Future Thinking Today* as branding for the changes, only 25 percent of the respondents had seen or heard of it, and most of those first became aware of it with the brochure sent out in September 2018. Until it is widely known, this is not effective branding.

Identification and participation

One-third of schools were finding it easy to identify their professional learning needs

Just over one-third of all leaders reported finding it easy to identify the capabilities of staff and from there the overall learning needs of their school. However, 39 percent of schools had yet to start the process.

Most of the schools (64 percent) who had started to identify their needs had visited the Kia Takatū ā-Matihiko / Digital Readiness Programme site. Just under one-third of these had used the teachers' self-review tool on that site to support the identification of needs. A few more used the e-learning planning framework[13] (eLPF) to gauge their needs. The use of the eLPF could indicate a lack of understanding about digital technologies with reference to curriculum content. It is an understandable mistake given the website describes 'how digital technologies are integrated into teaching and learning within each dimension of the framework'. The eLPF is a tool to gauge a school's overall capability with e-learning; that is, using digital devices to enhance and extend

[12] 'Future Thinking Today' is simply a branding mechanism, and as such had no associated usefulness.
[13] Available at http://elearning.tki.org.nz/Professional-learning/e-Learning-Planning-Framework#js-tabcontainer-1-tab-2

learning. It does not refer to the DT curriculum content. Nevertheless, several leaders may have found this tool useful to determine the level of digital fluency in their school.

Some school leaders said that it would be helpful to have a tool that aggregated staff responses to help them determine an overall picture of capabilities and needs for their school.

> *I got all the teachers to complete the self assessment [Kai Takitū ā-Matihiko[14]] – but unsure if I can see the collated results for the school – I need this to inform my planning and accountability measures.* Principal

Resources relating to content were not always easy to access

Only about half of the schools reported it was quite easy or easy to locate content information. Of the remainder, 35 percent found it difficult and 14 percent had not even started looking.

> *There is an assumption that because it is online, schools will know about it – not an accurate assumption. Many schools need support to be pointed in the right direction.* Principal

> *I have to think about where I have to go for information each time I search; there is information in all different places.* Principal

Several respondents commented they found the language used in the DT curriculum content progress outcomes to be 'dense' making it difficult to engage with.

> *The wording of the curriculum is challenging, daunting.*
> Digital technology leader

Having face-to-face meetings with Ministry advisors or facilitators has helped to make sense of the progress outcomes.

The most common support for teachers was in-school support

Despite some difficulties sourcing information, most schools (64 percent of all schools) were already supporting their staff to engage with the DT curriculum content. The most common forms of support included internal professional development meetings and sharing readings, links to websites and resources (see Table 2). One-third of the schools reported using both of these strategies. Indeed, most schools reported using more than one strategy, including combining internal and external PLD.

[14] Available here https://kiatakatu.ac.nz/

Table 2: Support provided by schools for their teachers to engage with the DTc

Types of support	Schools (%)
Internal professional learning and development/staff meetings	47
School provided readings, links to websites and resources	46
Nothing	36
External professional learning and development	26
Work across Kāhui Ako	14
Within-school professional learning groups	10
Time to visit other schools	4

Over one-third of schools had done nothing to help their teachers come to grips with the DT curriculum content.

Early implementation support was limited

Ten percent of schools reported being unaware of the Ministry PLD options and a further 10 percent stated they had different priorities in their schools. Twenty-six percent of schools had applied for Ministry PLD at the time of the survey, and most had been approved. The schools whose applications were declined were prompted to either refine their applications or engage with a different learning support provision.

A few schools had applied for more than one type of PLD, but altogether the digital fluency PLD was the most in demand, requested by over half of the schools who said they had applied for Ministry PLD. Twenty-four percent of all schools recognised improving digital fluency of their teachers as their most compelling need. This highlights the importance placed on digital fluency as a precursor to working with the DT curriculum content.

> *We've worked collaboratively to encourage the disposition for learning amongst staff in relation to digital fluency.* Principal

A few schools had combined digital fluency with other PLD.

> *Within our writing PLD we have 10 hours of digital fluency.* School leader

Digital fluency PLD has been available since 2017 and many schools had already accessed this. However, the professional support related to Kia Takatū ā-Matihiko / Digital Readiness Programme or tailored PLD had yet to occur. Successful providers were not confirmed until well into 2018. As a result, the first phase of the Kia Takatū ā-Matihiko / Digital Readiness Programme website did not launch until July 2018.

Of those schools (13 percent) who had experienced some PLD from the Ministry, three-quarters reported it was a good to very good match to their needs at the time.

More than half the schools reported that at least some of their understanding about the curriculum content came from Ministry sources. Nearly two-fifths did not attribute any of their understanding to the Ministry's support. Similarly, about half of the schools reported that they gained the knowledge and skills to implement the curriculum content from sources other than the Ministry.

Some schools experienced frustrations with application processes

To assist schools and kura to incorporate DT&HM in their local curriculum a range of professional supports were offered. They include Digital Fluency, Kia Takatū ā-Matihiko / Digital Readiness Programme and specific DT&HM PLD:

- Digital Fluency is centrally funded PLD which requires a detailed application and is allocated through a regional panel process
- The national Kia Takatū ā-Matihiko / Digital Readiness Programme is free and available to anyone signing in through a web portal
- The specific DT&HM PLD is also centrally funded but applications are made through a simplified process and allocations determined by a national panel.

It was interesting to note apparent differences between the first and second tranche of approvals. In the first tranche, the hours awarded ranged from 25-400 and nine percent of the applications awarded low hours of PLD were also referred to Kia Takatū ā-Matihiko / Digital Readiness Programme. By contrast in the second tranche, the 16 percent who had their applications for PLD hours turned down were recommended to engage with Kia Takatū ā-Matihiko / Digital Readiness Programme[15] in the first instance. These inconsistencies may be indicative of some settling down in the initial operations of the allocation panel but proved frustrating for some schools. What is evident is a lack of understanding about the different kinds of support available and the processes needed to access them.

Some respondents to the survey who reported their applications had been declined said they were loath to resubmit as they found the process overly taxing.

> *We've missed out in the past; the process is onerous; haven't tried again.*
>
> Principal

[15] Source: Ministry supplied data, *Allocation Rounds 1 and 2*.

> *The PLD model puts up barriers to accessing PLD, the complicated process of applying makes it very difficult to get good-quality providers when we need them. We've been declined digital PLD twice and we're making a third application which we hope will be successful.* Principal

Some reported they had applied and were yet to hear back.

> *I had followed links on TKI [Te Kete Ipurangi] to apply for support - but did not receive a response. I had been encouraged by the fact that it was a simple form and process - but it didn't result in any response. I've now completed a PLD journal seeking support for digital technologies - yet to hear about result.* Principal

Other sources of support were a good match to needs

Thirty-five schools (16 percent) accessed both Ministry support and support from other sources.

Twenty-three percent of schools had accessed support from a variety of external providers, other than the Ministry. Some were found to be very helpful in unpacking the curriculum content and helping teachers to understand the DT curriculum content, in particular the progress outcomes.

Implementing the new curriculum content

At this stage, only a few schools seem ready

Only seven percent of all the schools reported they had a quite good understanding, and enough knowledge and skills to start to implement the DT curriculum content. The majority (88 percent) felt somewhat prepared.

All schools that had teachers who understood the DT curriculum content quite or very well had provided support to those teachers. Most teachers who did not understand the DT curriculum content were in the schools that had not provided any support to their teachers.

Coming to terms with the curriculum content is only the start of the journey. Certainly, most schools felt they needed to better understand the role of DT curriculum content within the Technology learning area, let alone the New Zealand Curriculum (the NZC) (see *Table 3*). Indeed, only eight percent reported they had teachers in their school who really understood the relationship between the DT curriculum content and the NZC and how this would inform their local curriculum design. Over one-third (38 percent) had no understanding at all. There is clearly development work to be done in this area.

Table 3: Understanding the relationship of DT curriculum content with the NZC

Understanding of how the DTc works within the NZC?	Schools (%)
Not at all	38
Some level of understanding	56
Clear about how it works	8

Schools with a digital champion were more advanced than others

Champions raised the profile of DT curriculum content in their school, often helping with internal PLD (see Table 4). They helped to drive the engagement of other teachers and there was a strong association between their presence and teachers' understanding of the DT curriculum content.

Table 4: A champion makes a difference

Schools' interaction with the DT curriculum content	Schools with a champion (%)	Schools without a champion (%)
Leaders aware of DT curriculum content	65	44
Teachers aware of DT curriculum content	51	32
Teachers are starting to engage through to engaging well with the DT curriculum content	76	4[16]
Teachers understand DT curriculum content quite well, or very well	19	1[17]

Over two-thirds of all composite or secondary schools had someone with enthusiasm who took responsibility for DT curriculum content in the school. By contrast, such curriculum champions were less common in primary schools with champions present in just under half of the schools.[18]

Schools also reported that the support and direction provided by school leaders made a difference. It is difficult to determine from the survey which came first, the leaders' direction or the prominence given to a champion. Certainly, other aspects that supported the advancement in schools included attitude of staff, professional learning groups, digital capability and fluency, an integrated curriculum structure, and access to good-quality professional support. These all indicate a particular culture for improvement within the wider school.

[16] At best teachers were only starting to engage.
[17] At best teachers only understood the DT curriculum content quite well.
[18] The difference between primary and other school types was statistically significant. The difference between school types was tested using a Chi square test. The level of statistical significance was $p<0.05$.

One champion helped teachers by:

> *Showing the relevance of the content for 21st Century Learners.*
>
> *When I was able to demonstrate an algebraic thinking/computational thinking session it helped teachers to see how it would work. It provided an extended platform for catching teachers 'real' examples of implementing. Exemplars can look a bit 'perfect'; it's more real when they see a teacher delivering with all the factors that can go wrong.*

No type of school was more advanced than any other

ERO tested the following school characteristics to determine if there were any associated differences in teachers' awareness, engagement with or understanding of DT curriculum content:

- roll size (very small, small, medium, large, very large)
- decile (low, medium, high)
- location (main urban, minor urban, secondary urban, rural)
- member of a Kāhui Ako (yes or no)

There were no statistically significant differences between the awareness, engagement or understanding of these groups.[19] The testing included those seven percent of schools that were ready to implement. The exception was school type (primary, secondary or composite). As noted previously secondary and composite schools were more likely than primary to have a champion and therefore more likely to be aware, engaged and understand the DT curriculum content than their primary counterparts.

Two-thirds of schools have made changes taking into account the DT curriculum content

One-third of schools had yet to make any changes. Changes described in the rest of the schools range from relevant changes preceding the DT curriculum content, to planning wider changes into which DT curriculum content will be integrated.

> *We had already implemented a future-focussed curriculum - digitally focused. The new curriculum [content] has given credibility to what we are doing.*
>
> Principal

[19] The difference between these groups was tested using a Chi square test. The level of statistical significance for all testing in this report was $p<0.05$.

At least 10 percent of schools were already undergoing some curriculum review and exploring how the DT curriculum content would tie in with that. Examples of this work included:

- focusing on design thinking
- changing the curriculum structure
- using school-wide rich topics
- trialling project-based learning
- integrating learning across curricula
- shifting the pedagogy to more student-centred pedagogy, promoting student agency.

> *We were starting to do things differently anyway; as part of the bigger picture. We are already looking at a wider approach to learning i.e. looking at inquiry learning. This has an impact on our Year 9 and 10 course and the way it is timetabled. We are trying not to say 'here is DT curriculum content as a separate thing we need to do', but to consider it in the whole curriculum.*
>
> Principal

Several schools reported they have audited their curriculum, which has shown some aspects of the DT curriculum content are already happening in their programmes without being specifically linked to the DT curriculum content.

> *The school is already doing computational thinking - we were already working well with SCRATCH and coding and design; exploring around makey makey, robotics, 3D design.* DT Leader & principal

More exemplars of how such work ties into the DT curriculum content would be useful for schools. They would reassure teachers that early progress outcomes in the DT curriculum content may already be met within their current school curriculum.

Teachers feel confident to 'have a go' and some have started planning

Almost all respondents (95 percent) reported their teachers were at least somewhat confident to start working with the DT curriculum content. Similarly, 95 percent felt teachers had at least some knowledge and skills in their school to start implementation.

Some schools had already started implementing the DT curriculum content (see *Table* 5). Just under half of the schools reported planning at some school-wide level and at individual teacher level. Thirteen percent had already integrated the DT curriculum content into their overall school curriculum and 10 percent reported most of their teachers are planning with the DT curriculum content.

Table 5: State of DT curriculum content planning

Planning in the school curriculum	Schools (%)
Nothing yet school-wide	47
Some school-wide planning	40
Included in overall curriculum	13

Planning by teachers	Schools (%)
Nothing yet	36
Some individual planning	54
Most/all teachers planning	10

Capability and time were the most common concerns for implementation

The most common barrier to fully implementing the curriculum was identified as the capability of teachers (see Table 6). Thirty percent of schools identified this as a concern, but it was not explored in depth in the survey. The next highest concern was finding the time to come to grips with the curriculum content. A few schools expressed more than one concern.
Thirty-seven percent of schools reported they had no concerns about implementing the DT curriculum content.

Table 6: Concerns raised by schools

Concerns	Schools (%)	Schools with a champion (%)	Schools without a champion (%)
Capability of teachers	30	23	37
Time	28	20	36
Don't have enough digital devices	15	13	17
Not a priority	14	No significant difference	
Internet problems	3	No significant difference	
Students have different pressing needs	1	No significant difference	
No concerns	37	47	25

Forty-seven percent of schools with curriculum champions said they had no concerns about implementing the DT curriculum content by 2020. By contrast only one-quarter of the respondents without a curriculum champion reported no concerns. This difference was statistically significant.

It has been a slow start – many schools will not be ready to implement

Overall, the progress schools have made has been slower than expected. Most schools need to access support to raise understanding, knowledge and skill levels if they are to successfully implement the DT curriculum content. In ERO's opinion, many schools will not be ready to implement the DT curriculum content as required by the start of 2020. School leaders have indicated that they need more time and resources to implement changes.

Some schools reported they have current priorities other than the DT curriculum content or are undertaking an overall curriculum review and plan to incorporate the DT curriculum content into this longer-term process. It appears that these schools are not planning to meet their obligations regarding implementation by January 2020.

However, much of the slow start can be directly associated with delays in establishing a coherent support programme. This has compromised the progress of schools. The early implementation of support for schools working towards implementing the DT curriculum content has limitations. The necessary components for effective support, identified in the assumptions[20], have not yet been met in full. For example, the assumption that teachers are digitally fluent as they participate in the support for the DT curriculum content does not hold, given that half of PLD applications were for digital fluency and just under a quarter of all schools recognised this as a compelling need.

Too many schools did not know about the DT curriculum content, where to find the best information, or what PLD options were available to them. Too many schools have not started to look at the DT curriculum content, and, of those that have, too few have sufficient understanding, knowledge and skills to start to implement the Digital Technology curriculum content.

The PLD targeted to the DT curriculum content was not available until late in 2018. Many schools are seeking foundational development in digital fluency, let alone addressing readiness or curriculum planning. The New Zealand Centre for Educational Research (NZCER) in their report *Digital technologies for learning: Findings from the NZCER national survey of primary and intermediate schools 2016* [21] noted that:

> ***17 % of teachers and 15 % of principals commented on the need for adequate professional learning to support teachers' capabilities with digital technology [digital devices].***

The NZCER found the most common use of digital devices in the classroom was limited to practising skills, research on the internet, and creating documents or power point presentations. Just over half sometimes generated multi-media work or played games or simulations. It was far less common for students to collect and analyse data or do any coding or programming. This level of use indicates a lack of understanding of or capability to extend learning in ways not possible without devices. It clearly demonstrates the need for development in this area.

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[20] Refer to Figure 1. Assumptions are noted in the Theory of Change. The example given relates to Q2 in the figure.
[21] Bolstad Rachel, 2017. *Digital technologies for learning: Findings from the NZCER national survey of primary and intermediate schools 2016*, NZCER, Wellington. Available here https://www.nzcer.org.nz/system/files/Digital%20technologies%20report.pdf

Most respondents to ERO's 2018 survey (71 percent) had confidence their teachers will implement the DT curriculum content. However, the confidence is clearly at odds with the fact that only seven percent said their teachers sufficiently understood the DT curriculum content and its place in the NZC and had enough knowledge and skills to implement the DT curriculum content. Nor does the statement of confidence take into account that 30 percent of schools had concerns about the capacity of their teachers to complete the work. This disparity was not explored in the survey questioning. It is possible the stated confidence could be a reflection of the confidence the respondents had in the professionalism of their staff to do what was necessary regarding the curriculum.

The respondents had a range of different roles[22] and would, of necessity, have a slightly different perspective on what was happening in the school. ERO has taken each response at face value, being unable to verify any of the claims made.

What is getting in the way of progress?

While many schools have started to work with the DT curriculum content, progress has been hampered by some schools' lack of awareness and lack of commitment to their responsibilities regarding the gazetted curriculum content. Progress has been further hampered with difficulties sourcing information and accessing Ministry PLD. ERO suggests the Ministry consider these aspects:

- explore more direct communication options, including increased presence of Ministry advisors and opportunities for face-to-face workshops to improve engagement with the DT curriculum content, especially as schools move into the planning phase
- consider including hyperlinks in online material to help people navigate resources and information about the Digital Technology curriculum content
- enhance the scale and reach of Te Kete Ipurangi (TKI) content.

The lack of commitment by some school leaders to this compulsory curriculum content is of concern. Boards of trustees should consider including a component in their principal's appraisal focusing on meeting the obligation to implement the DT curriculum content from January 2020. This is their obligation under National Administration Guideline 1 which states that:

> ***Each board, through the principal and staff, is required to:***
>
> - ***develop and implement teaching and learning programmes:***
>   - ***to provide all students in years 1–10 with opportunities to progress and achieve for success in all areas of The National Curriculum***

[22] Respondents were predominantly principals, but there were also senior leaders, champions and specialist teachers.

The difficulties reported with PLD include the application process itself, the consistency of decisions made by the allocating panel, and the late availability of programmes in 2018. Some leaders are also experiencing difficulties in identifying the overall needs of their school. ERO suggests the Ministry:

- provide ways to help school leaders identify school-wide professional learning needs
- provide a wider range of PLD closely linked to the DT curriculum content professional learning and supports
- make clearer the distinctions between:
    - the use of the term 'digital technologies' on its websites when it refers to both use of digital technologies and digital technologies as design intervention
    - the application processes for centrally-funded Digital Fluency work versus centrally-funded tailored support for the Digital Technology curriculum content.

School apprehensions about teacher capability and the time needed to effectively implement the Digital Technologies curriculum content are legitimate concerns for leaders and teachers. Research clearly shows that to effectively embed changes in curriculum (which includes pedagogy) requires good-quality time to engage deeply with what is required, plan and implement, reflect on effectiveness of teaching and learning, and make improvements to the programme. The Ministry could usefully explore ways it could better support school leaders to address these concerns.

What is helping progress?

Leaders who are forward looking are supportive of the work required to implement the DT curriculum content. Their schools appear to have an improvement focus. Many are already working on curriculum review to enhance students' learning and they see the DT curriculum content will be a part of that. These schools often have champions, and having someone with that interest who takes responsibility clearly helps the school progress. They are confident to make changes necessary to implement the DT curriculum content. The Ministry could encourage schools to designate someone with the responsibility for the DT curriculum content and provide overall support for that role.

Many schools recognise the need to upskill teachers in digital fluency to raise their confidence before beginning work with the DT curriculum content, and have sought or accessed appropriate PLD. Schools have found external PLD has been very helpful, especially with understanding the progress outcomes.

ERO suggests the Ministry consider adopting appropriate PLD models to help teachers better understand the DT curriculum content. Such PLD should be tailored to the individual needs of each school and support them to embed the Digital Technologies curriculum content within the school curriculum.

Next steps

ERO's phase 2 case studies will build on this baseline work and provide insights into the details of how some schools have worked toward DT curriculum content implementation: their approaches, challenges, solutions, and outcomes for students. The case studies may help to identify what additional support is needed at the system level to provide effective assistance for other schools, especially if implementation by 2020 is to be realistic.

Appendix 1: School sample

ERO generated a random sample of all state or state-integrated, English-medium schools in New Zealand. The sample was representative of New Zealand schools for type, decile and location.[23]

Table 1: School type

School type	Number of schools in sample	Percentage of schools in sample	National percentage of schools[24]
Contributing (Year 1-6)	80	36	34
Full Primary (Year 1-8)	93	42	43
Intermediate (Year 7 and 8)	10	4	5
Composite (Year 1-15)	8	4	3
Restricted Composite (Year 7-10)	1	1	1
Secondary (Year 7-15)	13	6	4
Secondary (Year 9-15)	16	7	10
Total	221	100	100

Table 2: School decile

Decile group	Number of schools in sample	Percentage of schools in sample	National percentage of schools
Low (Decile 1-3)	74	33	28
Medium (Decile 4-7)	81	37	40
High (Decile 8-10)	66	30	32
Total	221	100	100

[23] The differences between observed and expected values in Tables 1-3 were tested using a Chi square test. The level of statistical significance was $p<0.05$

[24] The national percentage of schools is as at September 2017.

Table 3: School location[25]

Location	Number of schools in sample	Percentage of schools in sample	National percentage of schools
Main urban	111	50	54
Secondary urban	15	7	6
Minor urban[26]	26	12	12
Rural	69	31	28
Total	221	100	100

[25] Main urban areas have a population greater than 30,000
Secondary urban areas have a population between 10,000 and 29,999
Minor urban areas have a population between 1000 and 9,999
Rural areas have a population less than 1000
[26] These cells have expected frequencies smaller than five. This means that the results are less reliable.

Education Review Office
Te Tari Arotake Mātauranga

Ko te Tamaiti te Pūtake o te Kaupapa

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