Digital technologies for learning:
Findings from the NZCER national survey of primary and intermediate schools 2016

Rachel Bolstad

NZCER
Rangahau Mātauranga o Aotearoa

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Key findings

This report provides a snapshot of information from the 2016 NZCER national survey regarding the role and impact of digital technologies for learning in New Zealand primary and intermediate schools. We asked teachers and principals how students were using digital technology in the classroom, and how this was benefiting their learning. We asked teachers and principals about their school's digital infrastructure, and the degree of support they had to help them make good use of this for teaching and learning. We inquired about the role of digital technology in supporting teachers' own professional learning and networking. We asked parents and whānau about the importance they placed on their children having opportunities for learning with digital technology.

Some key findings are summarised here in a series of themed infographics, along with a brief discussion of where to find further details and analysis in each chapter of the report. The survey results raise further questions which may be valuable points of discussion for school leaders, teachers, policy makers, boards of trustees, and parents/whānau in making ongoing decisions about the integration of digital technologies for learning in schools around New Zealand. Some suggested discussion questions are presented in the final chapter of this report.

How are students using digital technologies for learning?

One way to understand the evolving role of digital technologies in New Zealand schools is to investigate how students currently use digital technologies in the classroom to learn, create, and share their work, and communicate, connect, and collaborate with people within and beyond their schools, and how this is changing over time.

Teachers' reports suggest that students' use of digital technologies often centre on a few key kinds of activities, such as practising skills, searching for information, and producing work such as documents or slideshows. Other digitally-based learning opportunities are still relatively uncommon in primary classrooms (such as students learning to code or programme), or are quite variable between classrooms (for example, use of games and simulations, or creation of multimedia work).

One interesting finding was that many teachers say they would like their students to be using digital technologies to collaborate and communicate with people beyond the school on shared learning projects. The reasons why this does not already happen are unclear, but may include time pressures, a lack of opportunity to connect with people in other schools or the wider community around authentic learning projects, or teachers and students not knowing how or where to start in order to make this a reality.

For more on how students were using digital technologies for learning, see Chapter 2.

How are students using digital technologies for learning?

Practising subject-specific skills

92%
of teachers say this happens often or sometimes

5% say it doesn't happen, but they'd like it to

Researching using the internet

80%
of teachers say this happens often or sometimes

13% say it doesn't happen, but they'd like it to

Creating documents or slideshow presentations

70%
of teachers say this happens often or sometimes

20% say it doesn't happen, but they'd like it to

Is digital technology being used in other ways?

Creating multimedia

56% of teachers say this happens often or sometimes

35% would like this to happen

Playing games or simulations

55% of teachers say this happens often or sometimes

15% would like this to happen

Collect or analyse data
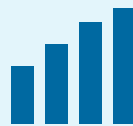
41% of teachers say this happens often or sometimes

38% would like this to happen

Code and/or program

19% of teachers say this happens often or sometimes

43% would like this to happen

Students are also using technology to:

collaborate within school on shared learning projects

47% of teachers say this happens often or sometimes

41% would like this to happen

maintain a record of goals and learning achievements

36% of teachers say this happens often or sometimes

41% would like this to happen

collaborate with people beyond the school

14% of teachers say this happens often or sometimes

65% would like this to happen

communicate with people beyond the school

36% of teachers say this happens often or sometimes

53% would like this to happen

share evidence of learning progress and achievements in public online communities

29% of teachers say this happens often or sometimes

28% would like this to happen

share evidence of learning progress and achievements in private online communities

34% of teachers say this happens often or sometimes

45% would like this to happen
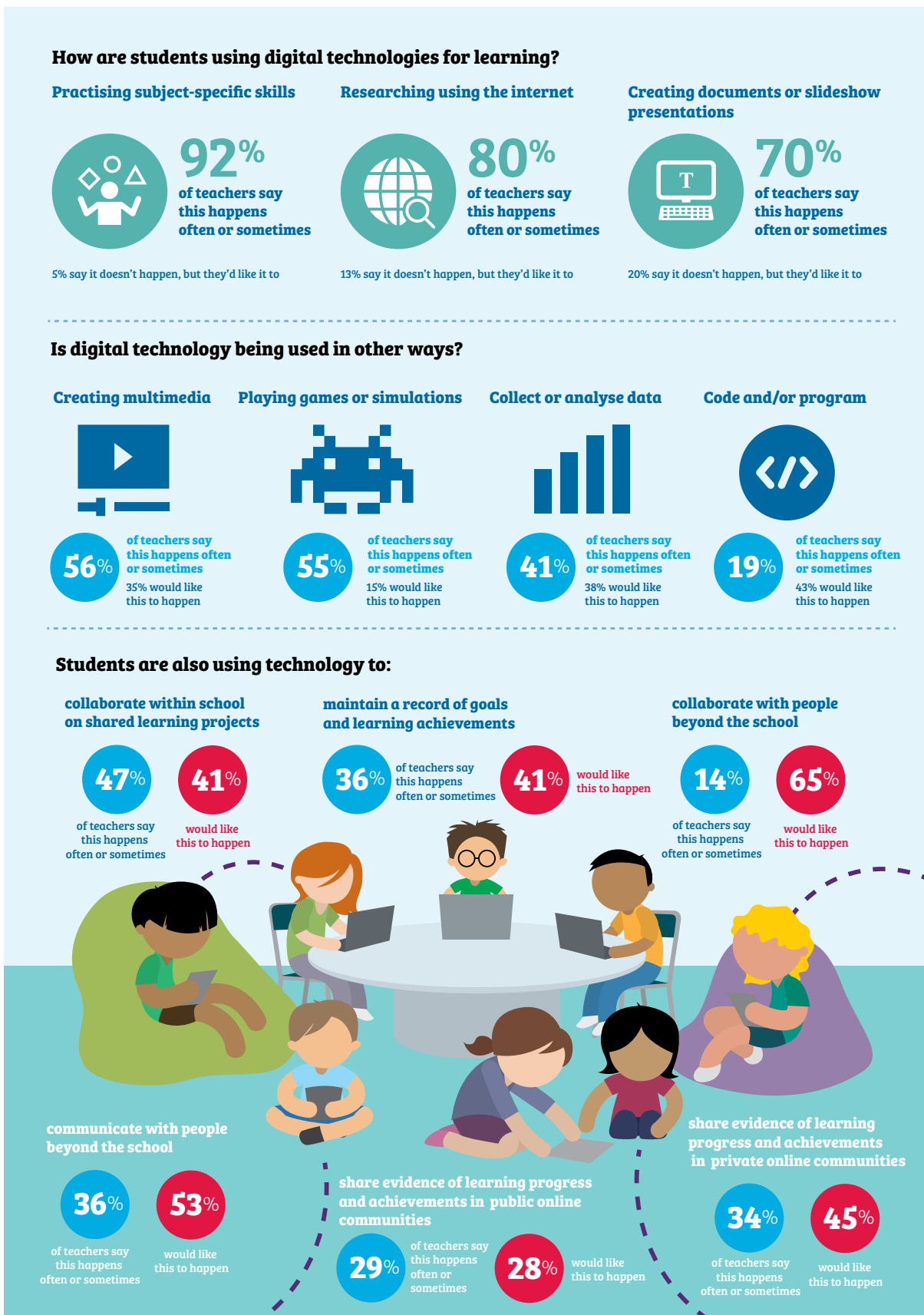
Is digital technology good for students' learning?

Teachers generally seemed to hold positive views about the benefits and impacts of learning with digital technologies. Most teachers agreed that digital technologies provide a range of benefits to learners, although some expressed concerns around equity of access, safety issues, or the impact on teachers' working hours. Even with these concerns it is notable that few teachers agreed that learning with digital technologies is too time-consuming for the benefits gained.

For more on teachers' and principals' views about the benefits of digital technologies for learning, see Chapter 3.

Is technology good for students' learning?

Teachers agreed that digital technology:

92% helps students with additional or special learning needs

81% has led them to experiment with new approaches to teaching and learning

72% helps students go deeper into their learning

70% gives students more control over their own learning

69% helps students see connections between school learning and their own lives

59% has contributed to a more collaborative classroom environment

53% is enabling more positive involvement of parents and whānau in students' learning

49% makes it easier to see students' strengths, interests, and what they are capable of

Teachers also expressed some concerns, saying digital technology:

68% creates some difficulties because not all students can access digital technology at home

57% create new types of safety issues that are concerning

53% pushes the working day further into their own time

10% is too time-consuming for the benefits gained
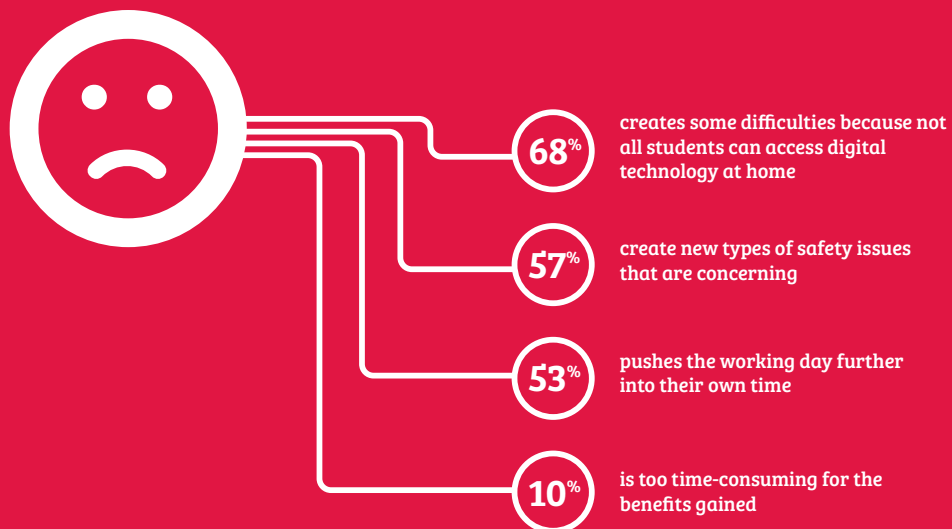
Including digital technologies in the curriculum

The 2016 national survey was undertaken not long after an announcement by the Minister of Education that digital technology will be more formally integrated into *The New Zealand Curriculum* and *Te Marautanga o Aotearoa* by 2018. We invited teachers and principals to comment on the inclusion of digital technology as a strand in the technology learning area. Forty-two percent of principals and 30% of teachers wrote a comment.

These comments suggest generally positive views about the inclusion and strengthening of digital technologies in the curriculum, saying that digital technology was "necessary" and "essential" learning for young people today.

Some teachers and principals raised a number of other issues and questions about how this will play out in practice. These include questions around equity of access, funding issues, overcrowding the curriculum, and professional learning and support for teachers. Some principals said they already faced challenges in keeping up with escalating costs for digital technology.

For more details, see Chapter 4.

Infrastructure and support for teaching with digital technologies

We asked teachers and principals a range of questions about the infrastructure, support, and capabilities within their schools to use digital technologies for teaching, learning, and professional work. The teacher surveys also included an open question, inviting teachers to comment on any additional support they thought they needed to integrate digital technology for learning into the curriculum.

While internet connectivity appeared to be good in most schools, some teachers and principals identified challenges accessing hardware or software that is suitable to their needs, at the times at which they or their students need it. The costs associated with keeping technologies up to date were a major concern for more than half of principals. Some principals and teachers raised questions about equity of access for schools or communities who cannot afford these costs.

For further details, see Chapter 5.

What do teachers and principals think about digital technology in the curriculum?

Some principals and teachers wrote a comment about the inclusion of digital technologies as a strand in the technology learning area of the curriculum.

Of those who commented:

40% of teachers and **19%** of principals made a generally positive comment.

> I think it's a great idea and a really positive move forward for NZ education. (Principal)

> Necessary in today's world. (Teacher)

22% of teachers and **30%** of principals commented on funding and infrastructure support.

> Great idea, but how do you make it equitable and achievable for ALL schools, low or high decile? (Teacher)

> It is a strand whose ongoing costs are challenging to finance through the budget. (Principal)

18% of teachers and **35%** of principals questioned whether digital technologies should sit within the technology learning area, or be integrated across the curriculum.

> I feel digital technology is a tool to access all learning areas of NZC. I do not believe it should sit within the technology strand exclusively. (Principal)

> I believe there are aspects of digital technology that need to be taught as a separate strand but there are also aspects that need to be integrated into other curriculum areas. (Teacher)

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

What do principals and teachers say about infrastructure and support for teaching with digital technologies?

Teachers say:

82% their school's internet access is adequate and reliable.

62% they have good technical support to deal with problems

60% that school equipment is adequate and reliable

56% say they have the knowledge and skills they need to provide learning with digital technology
and 21% disagree

56% say their school has strong leadership for the use of digital technologies
and 20% disagree

52% say that digital technology is available whenever their students need it for their learning
and 36% disagree

Principals:

65% say that their school has adequate expertise to support good quality learning with digital technology

52% say the costs of maintaining and replacing digital technologies is a major issue for their school

45% say that their school has adequate resources to support good quality learning with digital technology, and 33% disagree

Teachers' use of digital technologies to support their own work and professional learning

Most New Zealand primary and intermediate teachers were using digital technologies to find resources and teaching materials, and to collaborate with colleagues within their schools. Teachers were less likely to go online to discuss teaching and learning or to seek out online professional learning, though a small percentage of teachers did this often. If teachers had an online professional learning network, this most often involved connecting with between one and 20 other people on a regular basis, and more than a third indicated they have no online professional learning network (PLN).

The most useful online resources for supporting their teaching, according to teachers, were Te Kete Ipurangi (TKI), overseas resource sites, and subject-specific online networks. Aside from TKI, reasonably large proportions of teachers said they did not know or had not used various online resources we asked about.

For further details, see Chapter 6.

How do teachers use digital technologies to support their own work and professional learning?

97% say they download resources

90% say they collaborate with other teachers within their school

76% ask teaching-related questions online

62% share teaching resources online

61% say they collaborate with teachers beyond their school

51% contribute to online discussions about teaching

50% take part in online learning opportunities

Do teachers have their own online professional learning networks (PLN)?

37% of teachers say they have no online PLN

49% say they regularly connect with 1 to 20 people as part of their online PLN

11% say they regularly connect with more than 20 people as part of their online PLN

Which online resources do teachers find useful or very useful for supporting their teaching?

75% find TKI useful

37% find Facebook and/or Google+ useful

20% find the Virtual Learning Network (VLN) useful

11% find Pond/N4L useful

7% find Twitter useful

What is a PLN? PLN stands for Personal (or Professional) Learning Network. This usually involves an individual creating their own "network" of educators and other people from whom they seek advice, ideas, resources, to support their professional practice. PLNs can involve both online and offline relationships and communication, and often includes social media platforms. For more on PLN see:
http://gifted.tki.org.nz/For-schools-and-teachers/Professional-learning-support/Professional-Learning-Networks

Parent and whānau views about learning with digital technology

Most of the parents and whānau who responded to the national survey indicated that it is important for their children to have opportunities for learning with digital technology at school, though this is not the most important factor in choosing a school. Parents and whānau saw digital technologies as being ubiquitous and "part of the future", but also valued their children having a balance of other learning activities and opportunities. Some parents and whānau had online access to information about their child's school learning. This was more likely to be information about school events and trips than about what's happening in the child's classroom or work children have done that they want to share. Few parents indicated that they can access online information about their child's achievement or attendance.

For further details, see Chapter 7.

What do parents and whānau say about learning with digital technology?

Parents and whānau expressed a range of views

[Learning with digital technology is] the way of the future.

Technology is useful for learning but I'm more interested in developing emotional literacy and relationship skills.

Yes our children need technology, but I also feel that learning basic math i.e. times table should be 'old school'.

Parents' and whānau views on the importance of their child learning with digital technology at school

46%
36%
15%
1%

High importance	Medium importance	Low importance	Not sure
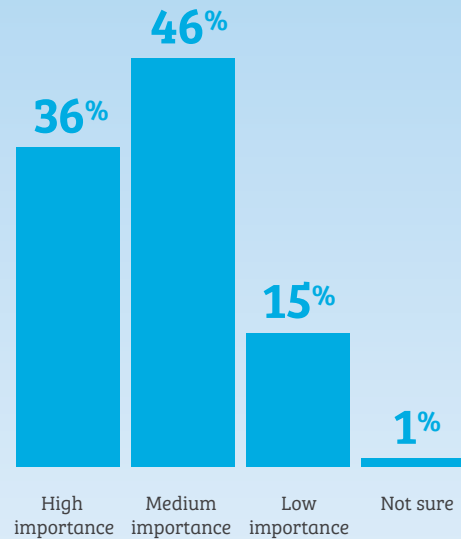
What online information can parents and whānau access about their child's learning?

60%
say they can access information about school events and trips online

37%
say they can access online information about things the child is doing in the classroom (including videos or blogs)

34%
say they can see work that their child wants to share online

15%
say they can view information about their child's attendance or lateness

13%
say they can view assessment results
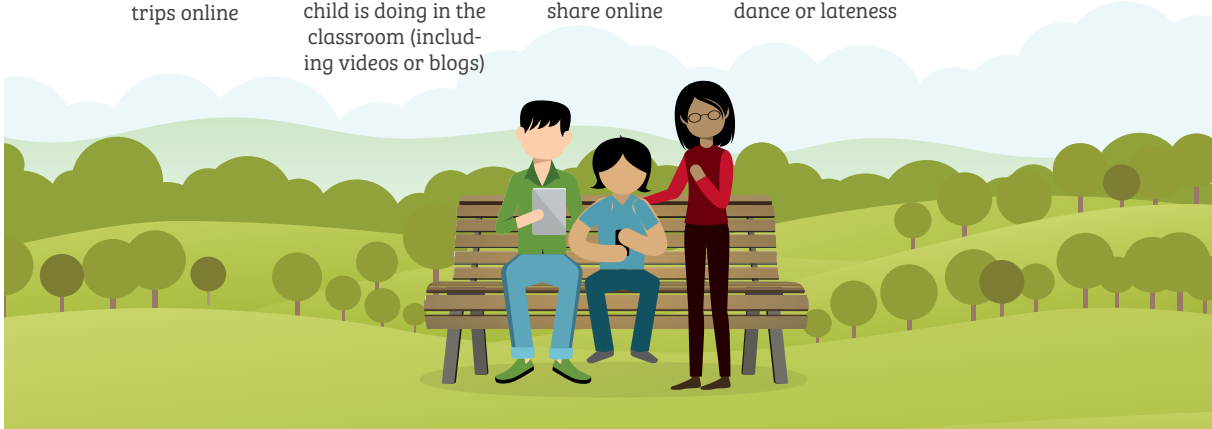
1
Introduction

The Ministry of Education identifies "supporting schools to make the most of new technologies" as a significant part of its work programme.[1] Over the past two decades there has been a significant and concerted effort to strengthen learning with digital technologies in New Zealand schools, through better provision of technology infrastructure, various programmes of professional learning and development, resources, and advisory services.

Given the high priority the Government has on learning with digital technology, there are many questions worth exploring. For example, what educational goals and purposes guide the integration of digital technologies in schools? How are primary students and their teachers actually using these technologies? Are students and teachers more "connected", as digital technologies promise? If so, how does this benefit learning? Do teachers feel well-prepared and well-supported to make effective use of digital technologies in their teaching and professional work? What resources are they using to support their practice? What barriers or challenges get in the way of teachers or students making the most of new technologies, and how are schools dealing with these challenges?

In this chapter I discuss some of the significant developments in the landscape of learning with digital technologies in New Zealand schools before outlining what sorts of questions we asked in the 2016 national survey.

The landscape for learning with digital technologies in New Zealand schools

Just as the technologies have evolved and diversified over time, so too has the language used to talk about their role in schools. In the late 1990s and early 2000s the language was about information and communication technologies (ICTs), and there was a variety of initiatives designed to get more hardware (such as laptops) into the hands of teachers and students, and to examine how these might be used in different ways to enhance learning and teaching. In the 2000s the focus turned more towards the language of learning, often described as e-learning or learning with digital technologies (LwDT). In recent years, the policy language around digital technologies in schools has turned towards the notion of "digital

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1   See http://www.education.govt.nz/ministry-of-education/specific-initiatives/digital-technologies-for-teaching-and-learning/

fluency", the meaning of which still seems open to interpretation,[2] but which at minimum connotes something that goes beyond simple "digital literacy".

The Government's current digital strategy, "Towards digital fluency", has several goals for schools:
- state-of-the-art infrastructure (including reliable high-speed broadband and fully-funded uncapped data)
- 21st century teaching and learning
- equitable access to quality content and resources.[3]

In 2012 the Ministry of Education created Network for Learning (N4L), a company set up to build a managed network and to provide ultra-fast broadband to schools. Additional Ministry-funded support to help achieve these goals includes the Connected Learning Advisory—Te Ara Whītiki (CLA) which provides free advice to schools on how to incorporate digital technology into teaching and learning, and the Virtual Learning Network (VLN), which supports teachers to connect and collaborate with colleagues online, and enables schools to connect with one another to share resources (e.g. students from a number of schools can share a teacher for a subject that the individual schools are unable to resource).

Numerous international studies[4] have underscored the importance of matching the investment in hardware and infrastructure with similar investments in teacher professional learning and development (PLD). The Information and Communication Technologies Professional Development (ICTPD) School Clusters Programme was part of New Zealand's teacher PLD landscape for a decade from 1999. The programme aimed to increase teachers' pedagogical understandings of ICTs in order to support effective classroom teaching and improve student achievement. More recently, Ministry of Education-funded providers such as Te Toi Tupu offered PLD to support learning with digital technologies. The Ministry-funded website, Te Kete Ipurangi (TKI) has been developed as a "go to" place for e-learning resources, networks, and PLD information, which includes the Virtual Professional Learning and Development programme. From 2017, digital fluency has been included in a small number of national priority areas for centrally-funded PLD. Each term, schools, kura, and Communities of Learning (COL) can apply for funding for PLD in the priority areas, with proposals assessed by regional allocation panels composed of sector representatives and Ministry representatives.[5]

In July 2016, shortly before we undertook this national survey, the Minister of Education announced that digital technology will be more formally integrated into *The New Zealand Curriculum* and *Te Marautanga o Aotearoa* by 2018. At the time this report was written, work was underway to develop new curriculum content relating to digital technologies in the Technology Learning Area of *The New Zealand Curriculum* and the *Hangarau Wāhanga Ako* in *Te Marautanga o Aotearoa*.

The 2016 NZCER national survey

The landscape for learning with digital technologies in New Zealand schools is a fast moving terrain. Developing survey questions and response options that can capture a rich and relevant picture of current practice can be challenging.

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2 See http://elearning.tki.org.nz/Teaching/Digital-fluency, also http://blog.core-ed.org/blog/2015/10/what-is-digital-fluency.html

3 See http://www.education.govt.nz/assets/Uploads/Towards-Digital-Fluency.pdf

4 See, for example: International Association for the Evaluation of Educational Achievement. (2015). *International computer and information literacy study: Preparing for life in a digital age.* Downloaded 10 August 2015, from http://www.iea.nl/ icils_2013.html. Also: Organization for Economic Co-operation and Development. (2015). *Teaching in focus 12: Teaching with technology*. Downloaded 10 August 2015, from http://www.oecd-ilibrary.org/education/teaching-with-technology_5jrxnhpp6p8v-en

5 For further details, see http://services.education.govt.nz/pld

In the 2016 national survey we asked teachers and principals how students were using digital technology in the classroom and how this was benefiting their learning. We asked teachers and principals about their school's digital infrastructure, and the degree of support they had to help them make good use of this for teaching and learning. We inquired about the role of digital technology in supporting teachers' own professional learning and networking. We asked parents and whānau about the importance they placed on their children having opportunities for learning with digital technology. Some of our questions have been asked in previous national surveys, enabling some insight into trends and changes in this area over time. Other questions were new questions that have not been asked in previous national surveys. This report weaves together findings from teacher, principal, and parent/whānau survey responses to generate a picture of the role of digital technologies in New Zealand primary and intermediate schools.

Methodology

The survey was conducted from August to early September 2016 and was sent to a representative sample of 349 English-medium state and state-integrated primary and intermediate schools (20% of all these schools in New Zealand).[6] At these schools, surveys were sent to the principal and to a random sample of one in two teachers. Surveys also went to the board of trustees' chair, who was asked to give a second trustee survey to someone likely to have a different viewpoint from their own. Additionally, surveys were sent to a random sample of one in four parents at a cross-section of 36 schools. The response rates were 57% for principals (n = 200), 38% for teachers (n = 771), 25% for trustees (n = 176), and 32% for parents and whānau (n = 504).

The survey returns for principals, teachers, and trustees were generally representative of schools in the sample, with the following small variations:
- Principal returns showed a slight over-representation of large schools, and urban schools. Decile 8–10 schools were somewhat over-represented, as were schools in the Auckland region.
- In the schools from which teachers returned surveys, there was a slight under-representation of large schools, and an over-representation of small–medium and small schools. Slight under-representations were evident of decile 1 schools and schools in the Auckland and Hawke's Bay/Gisborne Ministry of Education regions.
- The schools from which we received trustee surveys reflected some over-representation of large schools and under-representation of decile 1 schools.

The maximum margin of error[7] for the principal survey is 6.9%, for the teacher survey around 3.5%, and for the trustee survey around 7.4%. Sometimes we report results for smaller groups of respondents within each survey; the maximum margin of error reported for each survey does not apply to these groups. Calculating the margin of error relies on random sampling and because we rely on schools to select the teachers and trustees to complete surveys, we cannot guarantee that these samples are random. Therefore, the margins of error for the teacher and trustee surveys should be regarded as approximations. The parent and whānau sample is not a random sample, therefore we do not calculate a margin of error for that survey.

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6 Further details about the sample can be found in Berg, M. (2017). *NZCER national survey of primary and intermediate schools 2016: Methodology and sample information*, available at: http://www.nzcer.org.nz/research/national-survey
7 The maximum margin of error added to and subtracted from a proportion gives a confidence interval. We can say there is a 95% chance that the proportion is inside this range of numbers.

2

How are students using digital technologies for learning?

One way to understand the evolving role of digital technologies in New Zealand schools is to investigate how students currently use digital technologies in the classroom to learn, create, and share their work, and communicate, connect, and collaborate with people within and beyond their schools, and how this is changing over time. Variations of these questions have been asked in each iteration of the national survey since 2007, allowing for comparisons over time.

We also asked some new questions to find out about activities involving digital technology that are often touted as relevant for 21st century learning. These include coding, programming, gaming and simulations, and makerspaces.[8] We were interested in whether these kinds of activities, if they happened in schools, might be happening outside class time, and/or be optional activities for students, rather than part of everyday classroom learning and teaching. We asked about who plays a significant role in running these sorts of activities—for example, school leaders, teachers, library staff, students, parents or community members, or someone else.

This section reports findings in relation to these questions. We discuss what teachers said their students were currently doing with digital technologies, what teachers said they would *like* to happen in their classrooms, and to what extent additional opportunities such as coding, gaming, and makerspace activities are available to students within primary schools. It is important to note that this general picture of student use of digital technologies for learning is based on information provided by teachers, not from students themselves.

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8   A TKI page about makerspaces describes them as "collaborative workshops where young people gain practical hands-on experience with new technologies and innovative processes to design and build projects". A makerspace does not need to be a specially-designed space. It "can be any space in a school where students and teachers come together to create, invent, prototype, design, tinker, explore, discover, code, build, craft, draft, draw and more". For more information, see http://elearning.tki.org.nz/Teaching/Innovative-learning-environments/Makerspaces

Digital technologies for learning in the classroom

We asked teachers to respond to a set of statements to indicate different ways their students might currently use digital technologies in the classroom. Teachers could indicate whether these things happened often or sometimes, or if a particular practice wasn't currently happening, teachers could indicate whether or not they would *like* this to be happening.

Using digital technologies to learn, create, and produce work

As shown in Figure 1, the three most common ways students were using digital technologies for their school work were to practise subject-specific skills (reported as happening often or sometimes by 92% of teachers), research using the internet (80% often or sometimes), and creating written documents or slideshow presentations (71%).

Just over half said their students often or sometimes used digital technologies to generate multimedia work (including images, music, movies, animation), or to play games or simulations. Less than half of the teachers said students used digital technology to collect and/or analyse data, and less than a fifth of teachers said students use digital technology to code or program.

FIGURE 1   **Student use of digital technology to learn, create, and produce work, reported by teachers (n = 771)**
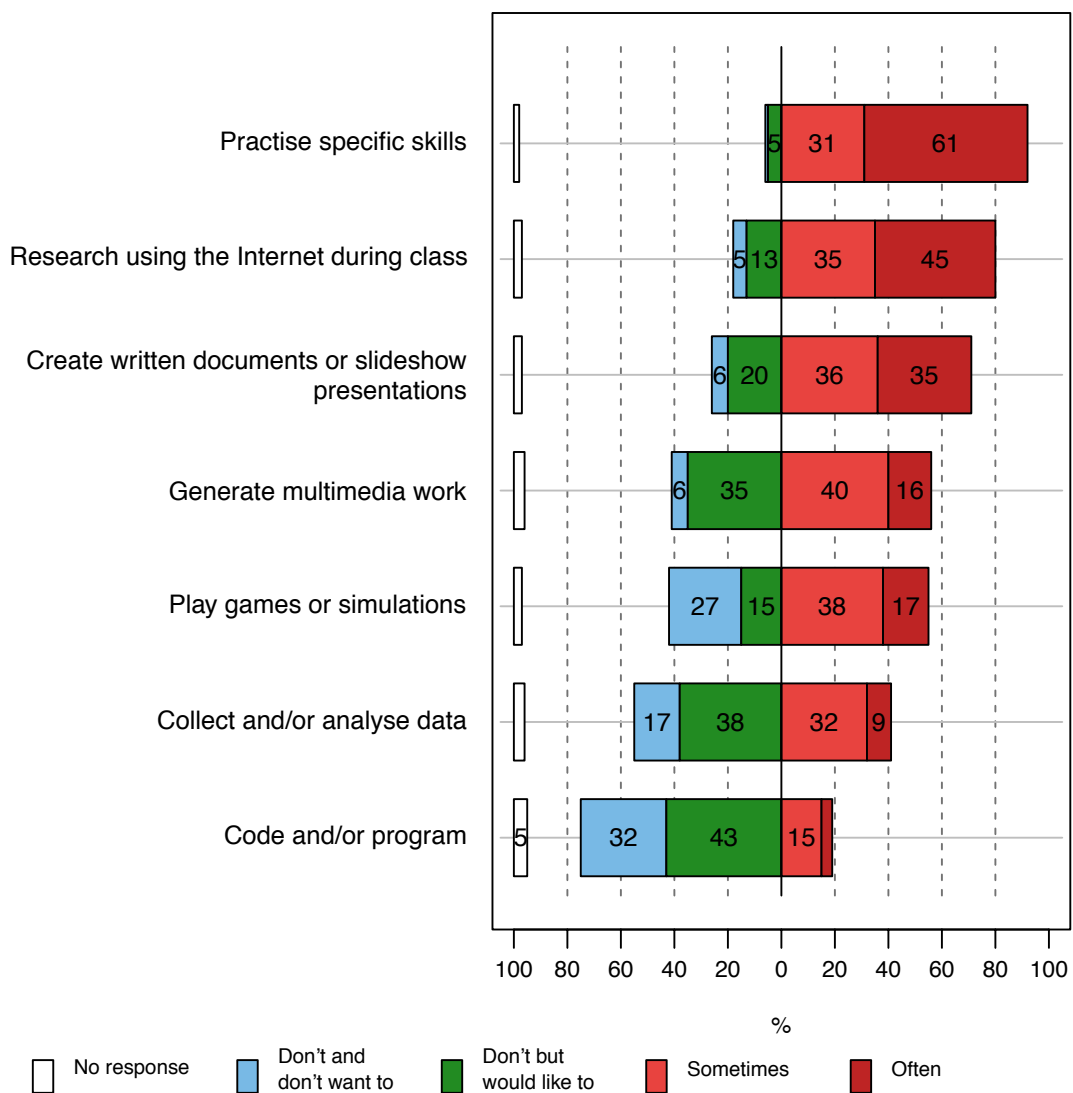
Using digital technology to communicate, connect, and share learning

Using digital technologies to communicate or collaborate is less common than using them to practise skills, do research, and create or produce work. Just under half the teachers (47%) said students often or sometimes use digital technologies to collaborate with others inside the school on shared learning projects (see Figure 2).

Around a third said students use it to communicate with people beyond the school (e.g. experts, other teachers or students, community groups), but only 14% said students use digital technology to collaborate with others beyond the school, including experts, other teachers or students, or community groups.

Thirty-six percent said students maintain a digital record of their learning progress and achievements, 34% said students share digital evidence of their learning progress and achievements in private online communities or e-portfolios, and 29% said students share evidence of their learning or achievements in public online communities or e-portfolios.

FIGURE 2 **Student use of digital technology to communicate, connect, and share learning, reported by teachers (n = 771)**
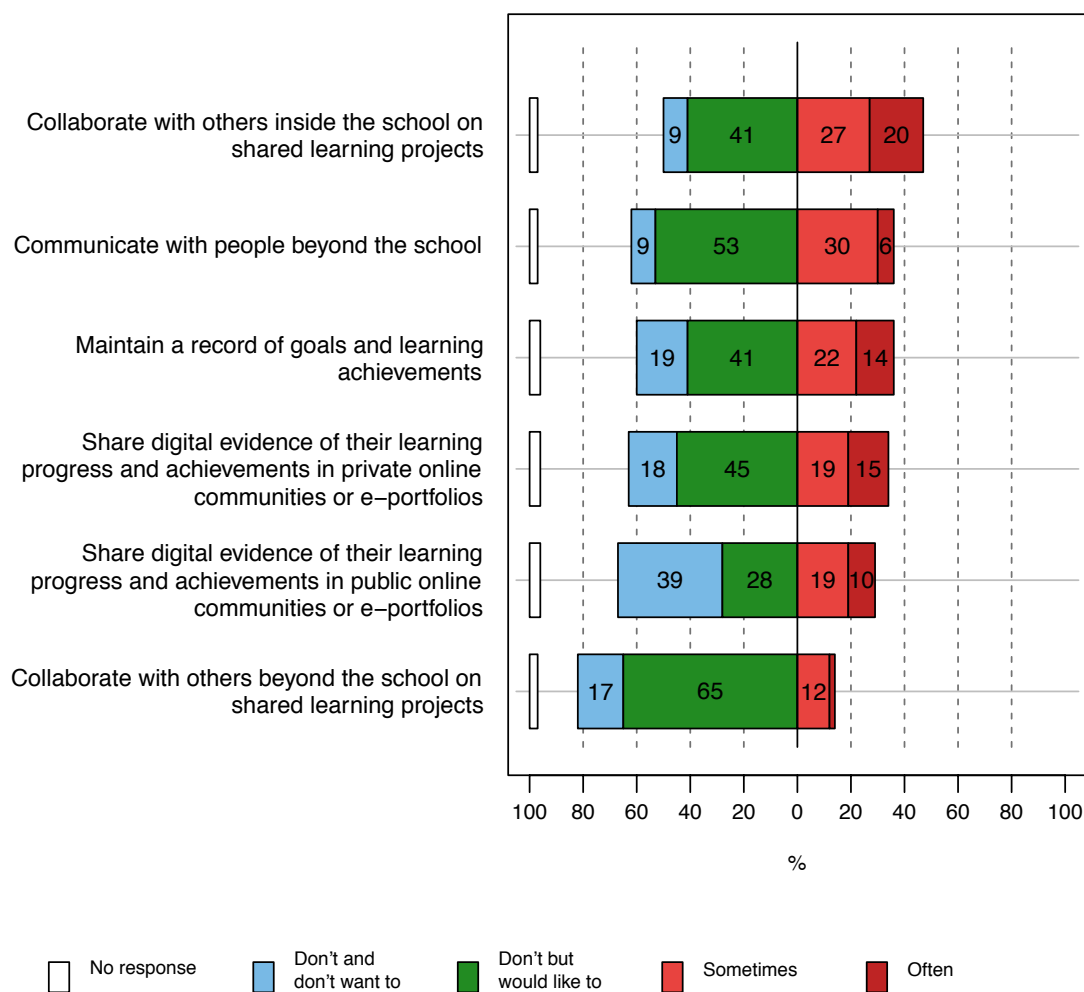
It is also interesting to look at which practices teachers said they would or would not like their students to be doing, if they weren't already doing so (shown in green and blue in Figures 2 and 3), and to consider what might be preventing these practices from happening more often in the classroom.

What teachers would *like* their students to be doing with digital technology

Of the five most common things teachers said they would *like* their students to be doing with digital technology—but which wasn't currently happening—four were about students using technology to communicate, collaborate, or share their learning:
- Collaborating with people beyond the school on shared learning projects (e.g. Google docs, wikis) (65% of teachers)
- Communicating with people beyond the school (e.g. experts, other teachers or students, community groups) (53%)
- Sharing evidence of their learning progress and achievements in private online communities and e-portfolios (45%)
- Collaborating with others inside the school on shared learning projects (41%)

In addition, 43% said they would like their students to use digital technology for coding and/or programming. This practice did seem to divide teachers though, with almost a third saying they didn't want to include this in their classroom programmes (see below). More than a third of teachers said they would like their students to be using technology to gather and analyse data (38%) and generate multimedia work (35%). Teachers from decile 1–2 schools were even more likely than teachers from decile 7–10 schools to indicate that they wanted their students to be using digital technology to generate multimedia work (50%).

What teachers *don't* want their students to do with digital technology

Some teachers identified practices they *didn't* want to include in their programmes. The most common things were:
- Sharing digital evidence of their learning progress and achievements in public online communities or e-portfolios (e.g. class blog, Twitter, Facebook, YouTube) (39%)
- Coding and/or programming (32%)
- Playing games and simulations (27%)

Why might teachers not want their students doing these things? Regarding students sharing their learning online, twice as many teachers did not want students sharing their learning in public online spaces (39%) as private online spaces (18%). One possible explanation for this may be concerns relating to privacy or children's safety. Regarding games and simulations, perhaps some teachers don't see this as useful or appropriate for their own students, or are not aware of how to find and use resources that might be useful for learning. Regarding coding, this may be an unfamiliar area for some teachers, although it is worth noting that, overall, more teachers said they *would* like to include coding and programming (43%) than those who said they did not want to (32%). Although teachers were not specifically asked to discuss their perspectives on coding and programming, 15 teachers did mention it in written comments about the role of digital technology in their practice. Most of these comments alluded to the professional learning, time, or access to devices that teachers felt they would need to be able to support students learning to code.

> I would consider teaching coding in my classroom. However, I would need to see practical applications in the classroom in ways it could enhance my students' learning. I would need a lot of professional development.

> Not having enough devices is an ongoing frustration. I would love to use Minecraft and coding to engage students but simply can't find the time at the moment to learn about this myself.

> I think coding is the way forward, needs to start young but also requires a lot of one to one time to teach juniors.

One teacher said they didn't think coding knowledge was necessary.

> Coding is a bit like saying to drive a car you need to know all about the engine—I don't need to know everything—just how to use it.

Changes in digital technology classroom practices

Table 1 shows the percentage of teachers who reported particular uses of digital technology for students' learning as occurring "often" in the last four cycles of the national survey. As the survey items are revised periodically, some questions have been asked in some years and not in others.

TABLE 1   **Digital technology uses that teachers reported students doing "often" from 2007 to 2016**

Use of digital technology to …	2007 (n = 912) %	2010 (n = 970) %	2013 (n = 713) %	2016 (n = 771) %
Practise specific skills (e.g. maths or reading)	22	38	58	61
Research using the internet	29	41	42	45
Create printed documents or slideshow presentations	42	29	24	35
Generate multimedia work (e.g. images, movies, music, animations)	5	12	14	16
Collaborate with others inside the school on shared learning projects	*	9	8	20
Collect and/or analyse data (e.g. from an internet site or spreadsheet)	5	3	10	9
Maintain a record of goals or learning achievements (e.g. e-portfolio)	*	*	10	14
Communicate with people outside the school (e.g. experts, other teachers or students, community groups)	7	*	7	6
Collaborate with others outside the school on shared learning projects (e.g. online book clubs, creating a wiki)	*	5	4	2

* Not asked

Overall, the data suggest that the use of digital technology for activities like skill practice and internet research has increased steadily since 2007. The use of digital technology to create printed documents or slideshow presentations has varied over the years, with no obvious explanation. There has been a general increase in the production of multimedia, and within-school collaboration, although these are more likely to be things that happen "sometimes" rather than often. Other kinds of digital technology uses—such as communication and collaboration beyond the school—still do not happen often in most primary and intermediate classrooms.

Coding, gaming, and makerspaces

Students' opportunities to participate

Across all teachers surveyed, 41% indicated their students have opportunities to participate in coding, gaming, or makerspaces at their school (Figure 3). Another 41% said students did not have these opportunities, and 17% were not sure. Overall, teachers from decile 9–10 schools were slightly more likely to say yes (49%) than teachers from decile 1–2 schools (26%).

FIGURE 3 **Do students have opportunities to participate in coding, gaming, or makerspace activities at your school? Teachers' responses (n = 771)**
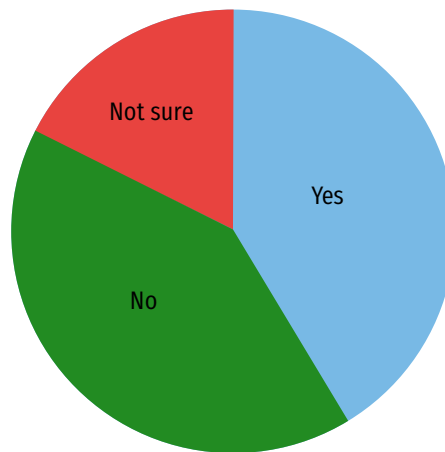
Who runs these activities?

Of those who said coding, gaming, or makerspace activities did happen in their school (*n* = 314), most (71%) said that just one or a few teachers had a significant role in running these activities (see Table 2). Some said that a principal or senior leader had a significant role (22%) or that students themselves did (19%). It was not common for this responsibility to be shared by most teachers in the school (7%). A few teachers (4%–8%) said parents or community helpers or library staff played a role.

TABLE 2 **Who plays a significant role in running coding, gaming, or makerspace activities in your school?**

	Teachers (*n* = 314) %
One or a few teachers	71
Principal or senior leader	22
Students	19
Parent or community helper	8
Most teachers	7
Library staff	4

We asked teachers to estimate how many students in their class had taken part in these activities over the past 12 months at school. Their responses in Table 3 suggest that, in most schools, student participation in these kinds of activities is limited to some or just a few students. Overall, it appears that student gaming or coding activities are somewhat more common than makerspace activities, with 41% of teachers saying at least "a small number" of students in their class have participated in these in the past 12 months, compared with only 7% of teachers who said this about makerspace(s). There were no significant decile-related differences.

TABLE 3 **How many students in your class have taken part in these activities over the past 12 months, at school? (n = 771)**

	Gaming or coding	Makerspace(s)
	%	%
All or most students	12	2
Some students	15	2
A small number of students	14	3
No students	29	39
Not sure/no response	29	55

Although teachers were not specifically asked to comment on coding, gaming, or makerspaces, a few mentioned these in written comments about teaching with digital technology. These comments largely suggest these are still relatively marginal practices in schools, and may be quite dependent on having appropriate resources and/or knowledge available within the school.

> I have introduced 'Scratch' into classroom with great success. We did have a 'coding club' 2 years ago for some students at lunchtime.

> Funding specifically for makerspaces and STEM activities would be great.

> With parent-helper facilitator, I run a Raspberry Pi lunchtime club using Python. With ASB support several after school coding clubs operate. Several interested teachers incorporate other coding opportunities within their class programme.

> We have had a couple of small groups use coding but reliant on a teacher with that knowledge being available.

Summary

Teachers' reports suggest that students' use of digital technologies often centres on a few key kinds of activities, such as practising skills, searching for information, and producing work such as documents or slideshows. These are of course quite broad categories of activity, and we don't know the details of the contexts in which they occur (e.g. the curriculum intentions and pedagogical approaches that underpin these ways of using technology). Other digitally-based learning opportunities are still relatively uncommon in primary classrooms, such as students learning to code or program, or are quite variable between classrooms (e.g. use of games and simulations, or creation of multimedia).

One interesting finding was that many teachers say they would *like* their students to be using digital technologies to collaborate and communicate with people beyond the school on shared learning projects. The reasons why this doesn't already happen are unclear, but may include time pressures, a lack of

opportunity to connect with people in other schools or the wider community around authentic learning projects, or teachers and students not knowing how or where to start in order to make this a reality.

Teachers had more mixed views about whether or not they would like their students to be doing things such as coding or programming, or sharing evidence of learning and progress in public online forums. Some did want these kinds of things to happen in their classrooms, others did not.

Responses to the new questions we asked about coding, gaming, and makerspaces suggest that these sorts of activities are still relatively marginal in primary schools, and if these opportunities are present, they are generally run by one or a few teachers, and not something that all students have opportunities to be involved in. Teacher comments suggest activities of this nature might be limited by the resources and knowledge available within the school to run them. It may also be that activities such as student gaming and coding clubs or makerspaces are not viewed as being especially relevant or important in many schools, or that schools simply have other priorities when it comes to curricular and co-curricular activities that might be offered within the school.

Some of the practical and conceptual challenges teachers and school leaders experience with respect to the integration of learning with digital technologies are discussed in Chapters 4 and 5.

3

Is digital technology good for students' learning?

Amongst the general public, discussions about the role of digital technology in young people's lives and learning often bring up two competing sets of ideas. On the one hand is the idea that digital technologies must invariably be beneficial for learning. Various reasons for this view include the idea that young people are more engaged by digital technologies, or that these technologies enable new ways of learning, or more effective ways to support certain kinds of learning. Digital technologies are often seen as "the way of the future", and therefore an inevitable feature of life and learning in the 21st century. Some people assume that young people's formative experiences in a digital world are enabling them to develop a native intelligence and fluency with digital technologies that previous generations do not have. Others see the importance of schools in providing opportunities for young people to build digital capabilities, and to redress inequities in young people's access to such experiences in their lives outside school.[9] Some people point to the ways in which assistive technologies can be used to overcome barriers to learning for students with additional learning needs.[10]

On the other hand, some people worry that digital technologies might be bad for young people and their learning, at least in some respects. This includes concerns that digital technologies might be a distraction, or that young people could miss out on other important developmental and learning opportunities if too much time or focus is directed towards digital technologies, at the expense of other kinds of learning and experiences. Related to this, some are sceptical about any causal link between the use of digital technologies and improved outcomes for students.[11]

The middle ground between these two sets of ideas is the argument that it's not the technologies itself that are necessarily good or bad for learning, but what we do with them—how they are integrated with pedagogy. As acknowledged in the previous chapter, the national survey gives us some insight into how digital technologies are used in learning, but is limited in the extent to which it can provide a picture of the pedagogies surrounding digital practices. However, we did ask teachers a few questions to gauge their views on whether digital technology was affecting students' learning in positive ways, and the extent to which digital technology has influenced pedagogical practice, classroom culture, student learning, and so on.

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9   For example, see http://2020.org.nz/blog/2016/06/24/new/
10 For example, see http://inclusive.tki.org.nz/guides/assistive-technology-at/
11 For example, see http://www.oecd.org/edu/students-computers-and-learning-9789264239555-en.htm

Teachers' views

Teachers generally consider digital technologies to have had a positive impact for students' learning (see Figure 4). Teachers were most likely to say digital technologies have been generally positive in terms of students' *engagement in* learning and *attitude to* learning (61% in each case). A further 30% thought digital technologies were positive for some students. Very few teachers (between 1% and 2%) indicated they thought they had a negative effect on students' engagement or attitude. Teachers were slightly less in agreement about the impact of digital technologies on students' attention span or ability to work collaboratively. While most still thought the impact was generally positive or positive for some, a few gave a neutral response, and between 7% and 9% judged digital technologies to have had a negative impact for at least some of their students. Again, we do not know exactly how digital technologies featured in each teacher's classroom practice, or why teachers see their impacts as positive or negative, but it is clear that most teachers' views of learning with digital technology are generally positive.

FIGURE 4 **Teachers' views about how digital technology for learning impacts students' learning (n = 771)**
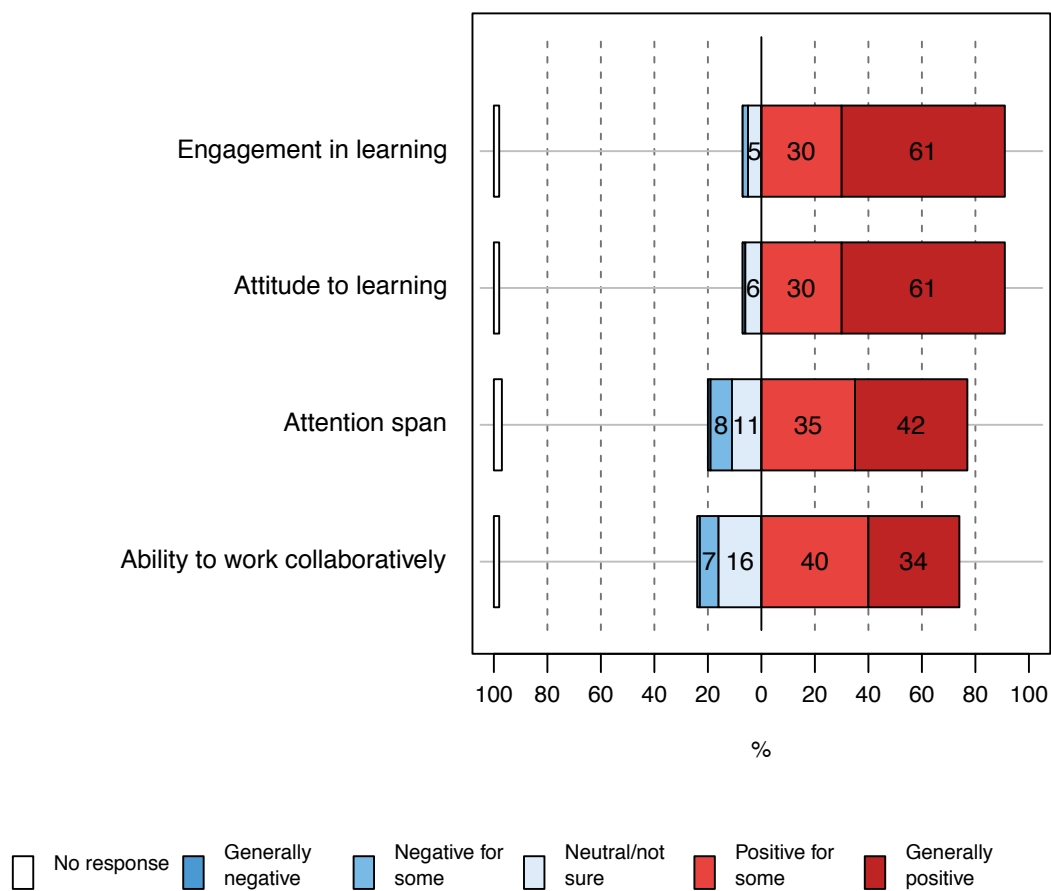
Figure 5 shows teachers' views regarding the impacts digital technologies have had on various aspects of learning, teaching, and professional practice. In terms of benefiting students, many teachers agreed or strongly agreed that digital technologies help students with additional or special learning needs (92%), that they help students go deeper into their learning (72%), that they give students more control over their learning (70%), and that they help students see connections between school learning and their own lives (69%). Teachers were more likely to agree than to strongly agree with each of these statements. Between

22% and 25% of teachers gave neutral responses to these items (excluding the item about the benefits for students with special learning needs, to which only 5% of teachers gave a neutral response).

Two further items about the role of digital technologies in supporting learners and learning drew more mixed responses from teachers. While 60% agreed or strongly agreed that digital technology has contributed to a more collaborative classroom environment, 29% gave a neutral response, and 11% disagreed. And while 49% agreed or strongly agreed that digital technologies make it easier to see students' strengths, interests, and what they are capable of, just over a third (34%) gave a neutral response, and 15% disagreed.

In terms of teachers' own practice, 81% agreed or strongly agreed that digital technologies have led them to experiment with new approaches to teaching and learning. Just over half (53%) agreed or strongly agreed that they are leading to more positive involvement of parents and whānau in students' learning, with just under a third (32%) giving a neutral response. Some decile-related differences were evident, with teachers from decile 5–10 schools more likely to agree or strongly agree and teachers from decile 1–4 schools least likely to agree or strongly agree. Just over half (51%) of teachers from decile 1–2 schools gave a neutral response to this question.

Some of the items in Figure 5 probe some of the possible negative impacts or consequences of learning with digital technologies. In terms of equity, 68% of teachers agreed or strongly agreed that it creates some difficulties because not all students can access digital technology at home. Decile-related differences were evident in this question, with teachers from lower decile 1–2 schools mostly likely to strongly agree that this was an issue (41%), compared with decile 7–8 (18%), and decile 9–10 (9%).

More than half (57%) agreed or strongly agreed that learning with digital technologies creates new types of safety issues that are concerning, or that it pushes the working day further into teachers' own time (53%). However, even with some of these concerns, it is notable that only 10% of teachers agreed or strongly agreed that learning with digital technologies is too time-consuming for the benefits gained.

FIGURE 5 **Teachers' views on the impacts of digital technology on teaching and learning practice (n = 771)**
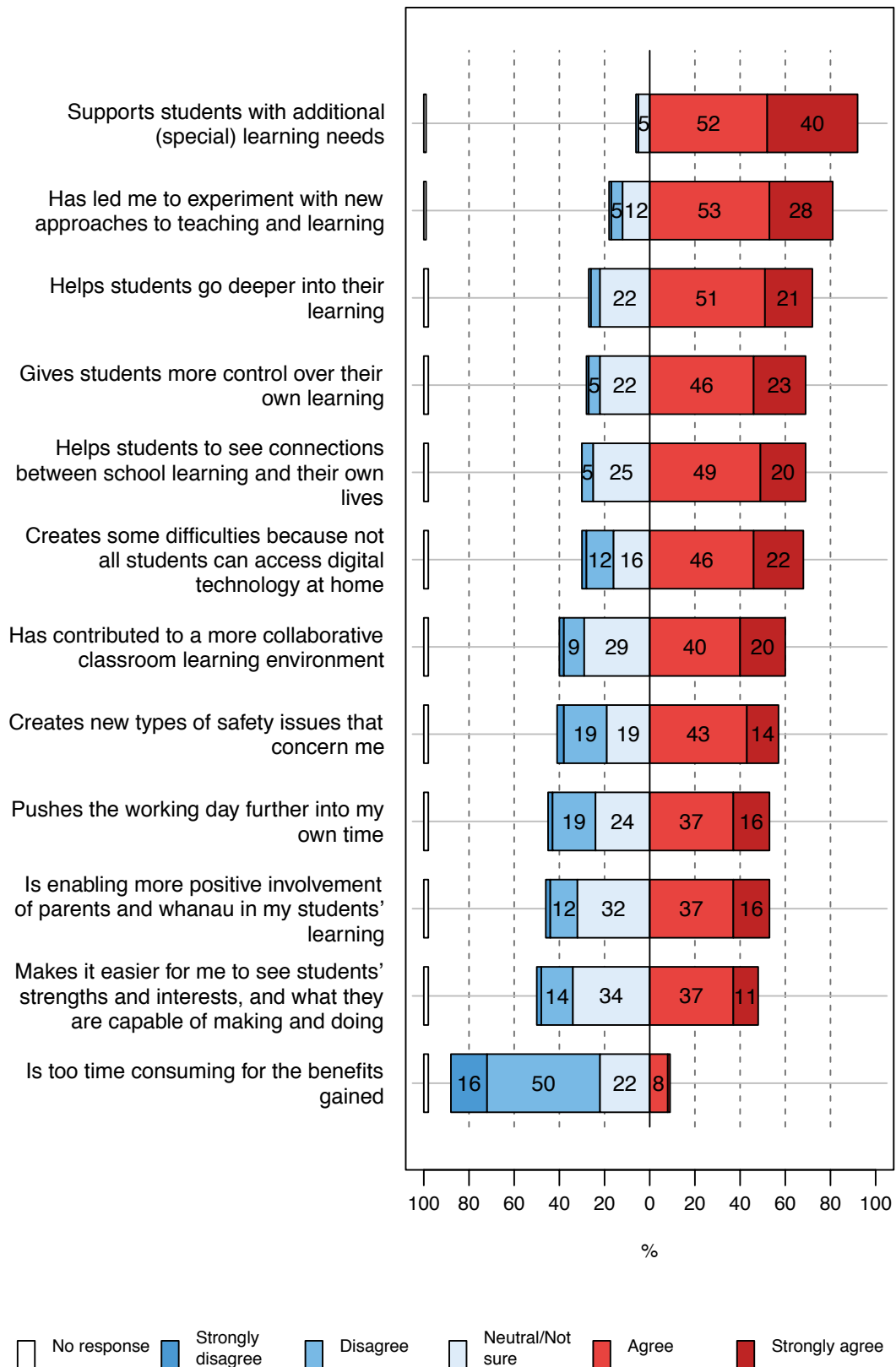
Changes in teachers' views

Table 4 compares questions that have also been asked in previous iterations of the national survey, and shows the percentages of teachers who agreed or strongly agreed with these items in each survey year. While there appears to have been some increase in the percentages of teachers agreeing that digital technologies help students go deeper into or have more control over their learning, and that they contribute to a more collaborative classroom learning environment, these increases may also be related to slight changes in the wording of these questions in different years.

TABLE 4   **Teachers' views about the impacts of learning with digital technologies, teachers who agreed or strongly agreed, 2007–2016**

Impact	2007 (*n* = 912) %	2010 (*n* = 970) %	2013 (*n* = 713) %	2016 (*n* = 771) %
Has led me to think about/experiment with new approaches to teaching and learning[12]	*	79	85	81
Helps students go deeper into their learning[13]	51	51	51	72
Helps students see connections between school learning and their own lives	*	*	65	69
Gives students more control over their learning	*	*	62	70
Has contributed to a more collaborative classroom learning environment[14]	*	52	54	60
Is too time consuming for the benefits gained	16	15	11	10
Pushes working day further into my own time	*	*	55	53

* Not asked.

Principals' views

Principals' responses to questions about digital technologies in their school are addressed in more detail in Chapter 5, but it is interesting to note here these findings from the 2016 survey (see also Figure 7, Chapter 5):

- 92% of principals agreed or strongly agreed that teachers in their school are changing their pedagogy to increase the effectiveness of learning with digital technology
- 90% agreed or strongly agreed that teachers in their school are increasingly using digital technologies to support access to the curriculum for students with special learning needs
- 73% agreed or strongly agreed that learning with digital technology has had an overall positive impact on students' achievement.

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12 In 2010 and 2013 the question item was phrased "is getting me thinking about new ways of teaching and learning". In 2016 it was "has led me to experiment with new approaches to teaching and learning".

13 In 2007, 2010, and 2013 the question item was phrased "helps students gain a deeper understanding of what they are learning". In 2016 this was shortened to "helps students go deeper into their learning".

14 In 2010 and 2013 this item was phrased "leads to a more collaborative classroom environment". In 2016 it was "has contributed to a more collaborative classroom learning environment".

Summary

Teachers and principals seem to hold generally positive views about the benefits and impacts of learning with digital technologies, increasingly so over time. Teacher and principal responses also indicate that, from their point of view, pedagogies are developing and adapting with new technologies, and that has been beneficial overall for students' learning.

How accurate are principals' and teachers' perceptions of the impacts and benefits of learning with digital technologies in their schools? We cannot answer this question with national survey data alone. Other useful information that could be used to triangulate with teachers' and principals' views might include more detailed information about teaching and learning practices and their impacts for students, and data from students themselves, including qualitative data about how they experience learning and teaching with digital technologies, and quantitative data on their learning achievements. These data are difficult to gather on a national scale and go beyond the scope of the national survey methodology. However, we can gain some further insights into the practical realities of learning with digital technologies in different schools by looking at teacher and principal responses to other questions in the survey, including their comments about the position of digital technologies in the curriculum (Chapter 4), what they say about infrastructure and support (Chapter 5), and how teachers use digital technologies for their own professional learning, networking, and support (Chapter 6).

4

The inclusion of digital technologies in the curriculum

The 2016 national survey was undertaken not long after an announcement by the Minister of Education that digital technology will be more formally integrated into *The New Zealand Curriculum* and *Te Marautanga o Aotearoa* by 2018.[15] We invited teachers and principals to comment on the inclusion of digital technology as a strand in the technology learning area. Forty-two percent of principals and 30% of teachers wrote a comment, incorporating a wide range of views. The most common themes in their comments are indicated in Table 5.

TABLE 5   **Themes in teachers' and principals' comments about the inclusion of digital technology as a strand of technology in the curriculum**

	Teachers who wrote a comment (n = 231) %	Principals who wrote a comment (n = 80) %
Generally positive comment	40	19
Funding and equity implications (e.g. concern about cost of updating digital technology, requests for additional Ministry funding)	22	30
Should be integrated across all learning areas, rather than a strand of technology curriculum	18	35
Implications for PLD/resources	17	15
Not in favour, or worried about effects of adding to NZC (e.g. effects on other curriculum areas/learning; crowded curriculum)	14	9

15 See https://www.beehive.govt.nz/release/nz-curriculum-include-digital-technology

Not a priority for all learners/particular challenges with young children	8	-
Neutral comment/unsure	5	8
Pedagogy is more important than devices	2	8
Needs further thinking (e.g. evidence/research that shows the benefits to learning, associated with using digital technology)	2	5
Not all families can afford BYOD or internet access at home	1	4

Generally positive views

Of those who commented, 40% of teachers and 19% of principals expressed a generally positive sentiment, saying that digital technology was "necessary" and "essential" learning for young people today.

> Go for it! We are teaching it anyway! (Teacher)

> Necessary in today's world. (Teacher)

> I am really excited about this. (Teacher)

> Awesome. Karawhiua mai. (Teacher)

> I think it is overdue. (Teacher)

> It is a must to have it as a strand, students will get left behind if they don't have current knowledge of digital technology. (Teacher)

> I think it's a great idea and a really positive move forward for NZ education. (Principal)

Funding and equity implications

Twenty-two percent of teacher comments and 30% of principal comments related to the funding and infrastructure support they believed would be necessary for this to impact positively for all students, asking whether schools would receive more funding, and raising questions about equity.

> Great idea, but how do you make it equitable and achievable for ALL schools, low or high decile? (Teacher)

> I think it would be good IF there was enough support/funding for teachers and schools to implement the programmes successfully. (Teacher)

> The development of digital technology as a strand will more likely require increased devices for students to use as learning tools. Some schools will pass this cost on to parents, some will not be able to do that. (Principal)

Some principals said they already faced challenges in keeping up with escalating costs for digital technology.

> It is a strand whose ongoing costs are challenging to finance through the budget. (Principal)

> If this is to be done then there is a need to ensure that all schools will be digitally able to teach to this or respond appropriately. My school is not at this point yet. We are still trying to achieve wifi and have still to find funds to equip our tamariki with the technology. We also need to think about those kura who do not have access to much out in the country. How would they cope? (Principal)

Digital technology ages quickly. It would be good if the Ministry supplied digital technology and kept updating/replacing it. (Principal)

We can't afford to buy enough devices, and being a decile 3 school we would have a lot of trouble with the have and have nots as we draw from a wide range of parent groups. (Principal)

Where should digital technology sit within the curriculum?

Eighteen percent of teacher and 34% of principal comments questioned where digital technologies should sit within the curriculum. Some said it should be integrated across all learning areas rather than be a strand within technology.

Digital technology needs to be integrated to the other curriculum subjects rather than taught as a standalone subject. (Teacher)

I see it as a positive step but not as an add-on—yet another subject. It must be embedded into all existing curriculum areas so it becomes as useful as picking up a pencil when necessary. It should not be just part of the technology curriculum. (Teacher)

I would rather digital technology be used to teach 21C skills and key competencies. If it (Digital technology) is used in isolation as a strand I don't know what the context for learning would be … Maybe coding? I don't think digital technology needs to sit outside of the learning—there is so much opportunity for digital technology to enable learning across the curriculum to be more collaborative and creative. (Teacher)

That is in a way a step backwards as technology especially eLearning and BYOD can be integrated and used in all curriculum areas. Don't restrict its uses, find new ways of getting it into all classrooms being used more effectively. Exemplars of ways to use it in all areas and resources to help achieve this. (Teacher)

A common refrain was to describe technology is a "tool" for learning, rather than being the focus of learning itself.

Digital Technology is a tool for education. I am not sure whether including it with [achievement objectives] as a strand is going to improve its use. (Principal)

Technology learning (e learning) is just learning. ICT are tools to facilitate learning. (Principal)

I feel digital technology is a tool to access all learning areas of NZC. I do not believe it should sit within the technology strand exclusively. (Principal)

Others saw it as a "both/and" situation, seeing digital technology as belonging across the curriculum as well as having its own specific focus strand.

I believe there are aspects of digital technology that need to be taught as a separate strand but there are also aspects that need to be integrated into other curriculum areas. (Teacher)

Digital devices are a learning tool. I have no problems with technologies such as coding, robotics being included as a strand. (Principal)

Digital technology is a key aspect of the curriculum but the digital tools pervade the whole curriculum … If it becomes a 'strand' of the technology curriculum you run the risk of dis-integration. If the digital technology becomes a strand the emphasis must be placed on integration through the whole curriculum. (Principal)

Some teachers and principals said that the curriculum is already too crowded, and worried that an additional focus on digital technologies as a curriculum strand would have a negative impact on other learning opportunities.

There is already enough to fit into the day to day curriculum. Adding this in will take away from the core subjects that are already stretched for time. Technology should be integrated, not taught separately. (Teacher)

If you add to a crowded curriculum, what is removed? (Either centrally or in individual schools) usually the arts and PE suffer first. (Teacher)

Our curriculum is already too crowded. Maybe this is appropriate at intermediate level, but not for all children at primary levels. (Teacher)

If you are referring to 'coding' then I feel at our school it is another way of crowding an already over-crowded curriculum which concentrates on National Standards. (Principal)

Support needed for teachers

Comments from 17% of teachers and 15% of principals mentioned teacher capability and the need for adequate PLD.

This is great but lots more PD needed for those that have never been exposed to it. (Teacher)

Important to have this as the digital revolution is well underway. However, also important to be realistic about the number of teachers currently who are not 'digital natives' and will need good support to feel confident about their ability to implement this curriculum. (Teacher)

Will be useful for students once teachers ALL have the skills to make the most of it, to promote in-depth learning and widen the range of learning opportunities by linking to others outside the school. (Teacher)

Teachers need to be capable of using these properly or it is a waste of time. (Teacher)

Some teachers assume putting devices in front of students is all that is needed. Not enough skills to develop efficient use of devices are taught. (Principal)

While some suggested all teachers should be supported to develop capabilities in this area, others thought there would be many teachers who would struggle, and a few suggested it was best to concentrate on developing those teachers who were most likely to have an affinity for it.

It will need teachers who understand and have an ability for this. (Teacher)

[I] feel that the number of digitally minded people aren't as common as you may think. If technology became part of the NZ curriculum this could be possibly done through 'specialist teaching' that some schools now have instead of whole day CRT. (Teacher)

I believe that many teachers are still struggling to get their heads around integrating ICT into their programmes in a meaningful way. For many it will be viewed as yet another thing to learn. (Teacher)

Other themes

Other themes in teacher and principal comments included some remarks about the relevance or appropriateness of digital technology for very young learners, issues with inequity of access to technology in students' homes, or comments stating that what matters is the pedagogy, and that further research and critical thinking were needed to ensure that digital technology was used effectively in service to learning.

Summary

Teacher and principal comments indicate generally positive views about the inclusion and strengthening of digital technologies in the curriculum. However, teachers and principals raised a number of other issues and questions about how this will play out in practice. These include questions around equity of access, funding issues, overcrowding the curriculum, and professional learning and support for teachers. These issues are addressed further in the next chapter.

5

Infrastructure and support for teaching with digital technologies

We asked teachers and principals a range of questions about the infrastructure, support, and capabilities within their schools to use digital technologies for teaching, learning, and professional work. The teacher surveys also included an open question, inviting teachers to comment on any additional support they thought they needed to integrate digital technology for learning into the curriculum.

Figure 6 shows teachers' responses to the closed questions, and Figure 7 shows principals' responses. Key findings are discussed thematically below.

Internet connectivity, equipment, and access

Most teachers (82%) agreed or strongly agreed that their school's internet access is adequate and reliable. However, fewer agreed or strongly agreed that they have good technical support to deal with problems (61%) or that school equipment is adequate and reliable (60%), and just over half (52%) said that digital technology is available whenever their students need it for their learning. More than a third (35%) disagreed or strongly disagreed with this statement, with teachers from decile 5–6 schools the most likely to disagree or disagree strongly (48%), and teachers in decile 9–10 schools the least likely to disagree (29%).

Only 45% of principals agreed or strongly agreed that their school has adequate resources to support good quality learning with digital technology, and more than a third (34%) disagreed or strongly disagreed.

Staff confidence and capabilities with digital technology

Just over half the teachers (57%) agreed or strongly agreed that they have the knowledge and skills they need to provide learning with digital technology, and that their school has strong leadership for the use of digital technologies for learning (56%). Interestingly, principals seemed to be slightly more positive, with 65% agreeing or strongly agreeing that their school has adequate expertise to support good quality learning with digital technology. It is possible that principals' evaluations of the expertise within their

school is based on the expertise of the most digitally-capable staff within their school being shared, or helping to raise overall levels of expertise across the staff over time.

Supporting students with additional learning needs

Elsewhere in the survey, teachers and principals indicated that learning with digital technologies was benefiting students with additional (special) learning needs (see Chapter 3). Ninety percent of principals agreed or strongly agreed that teachers at their school are increasingly using digital technologies to support access to the curriculum for students with additional learning needs, and 84% said students with additional learning needs have access to digital technology to support their learning.

However, only 45% of teachers agreed or strongly agreed that they have the knowledge and skills they need to support learners with additional learning needs who rely on digital technologies to access the curriculum, 28% gave a neutral response, and just under a quarter (24%) disagreed or strongly disagreed.

Principals' interactions with staff and whānau

Sixty-nine percent of principals said digital technology has positively influenced the way they interact with staff, with 31% strongly agreeing. A similar percentage (71%) agreed or strongly agreed that digital technology has positively influenced the way they interact with parents and whānau, with slightly fewer indicating strong agreement (27%).

FIGURE 6   **Teachers' views on the infrastructure and support for digital technology within their school**
(*n* = 771)
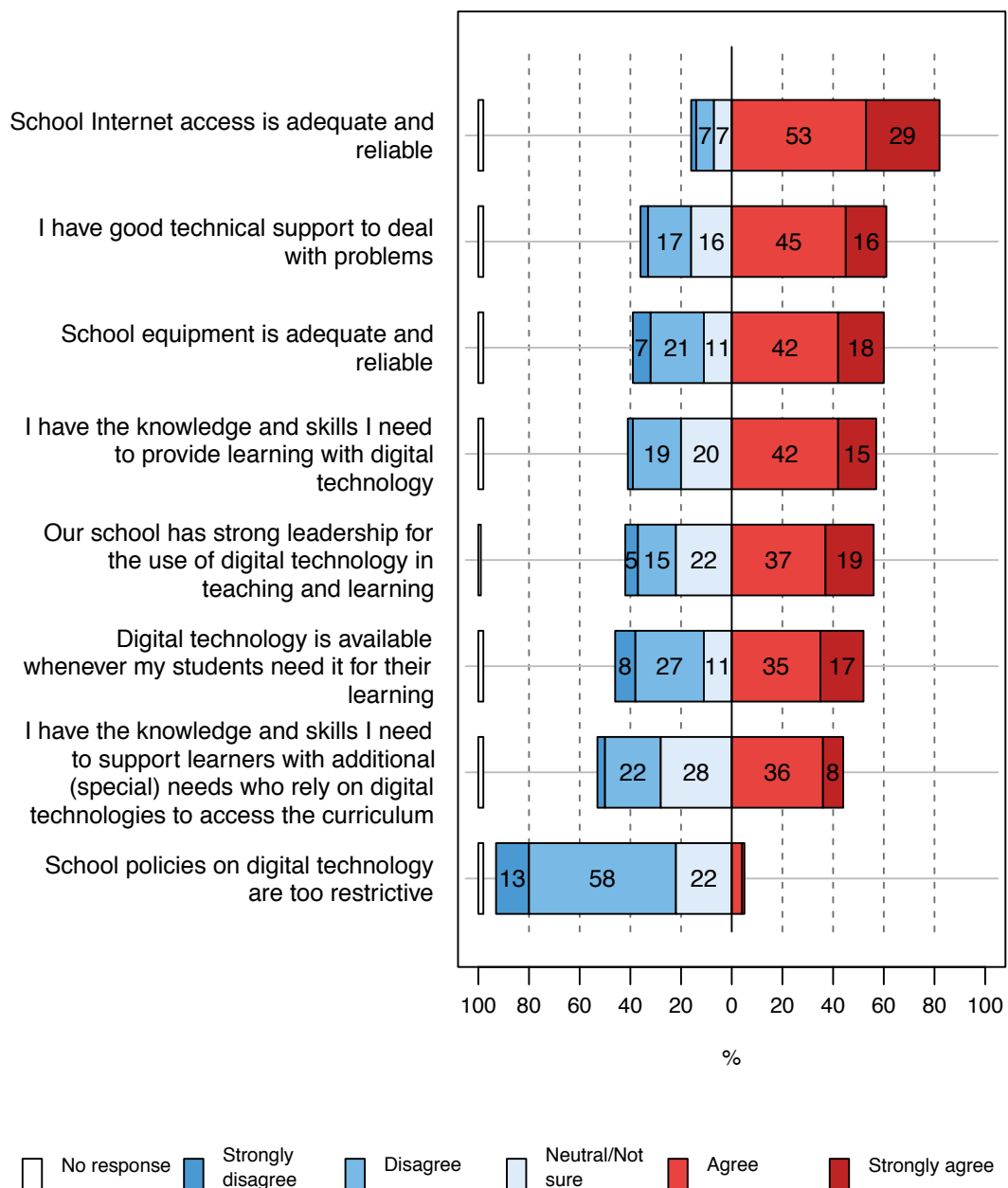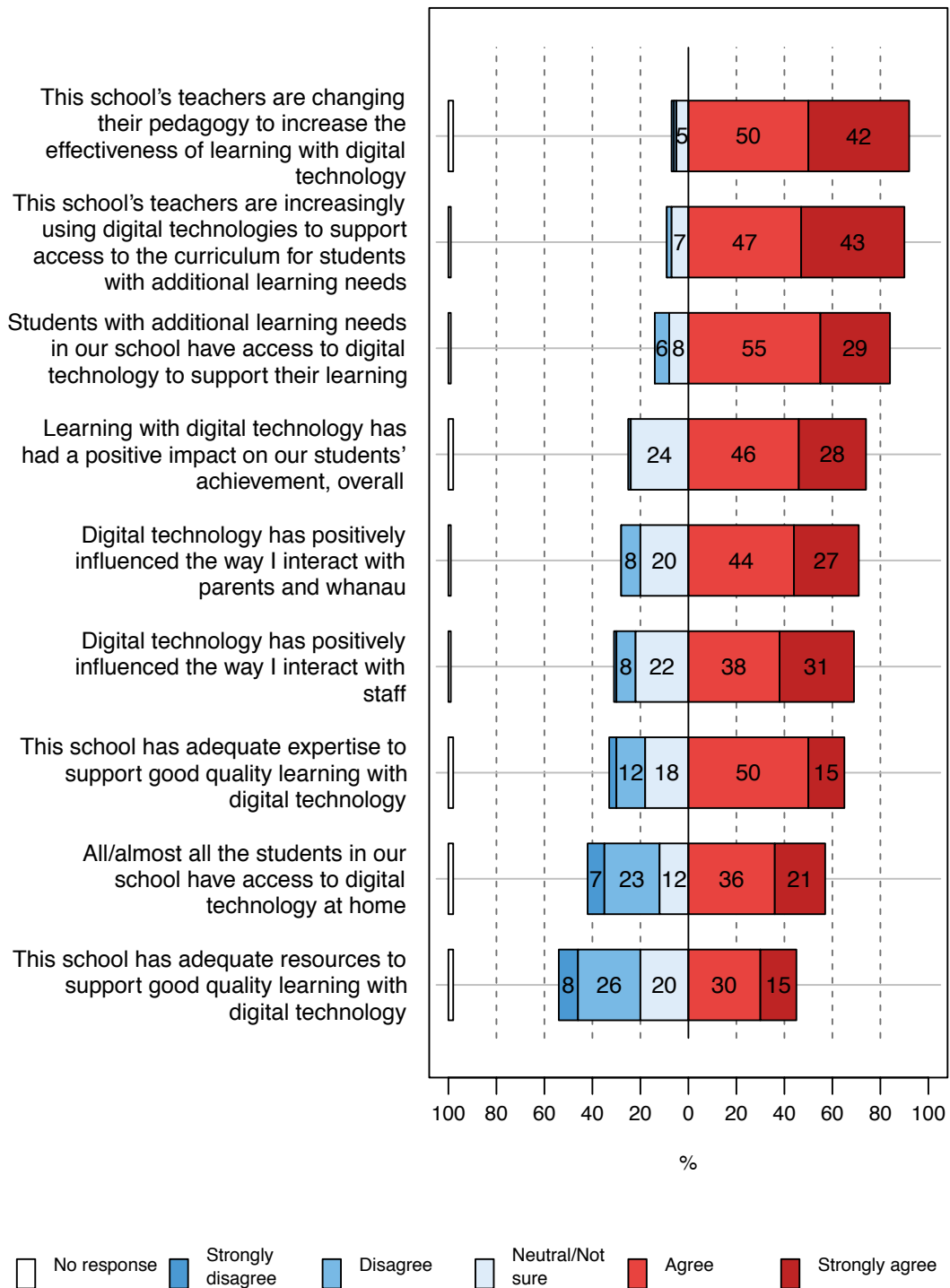
FIGURE 7 **Principals' views on the infrastructure, support, and use of digital technology in their school (*n* = 200)**

	No response	Strongly disagree	Disagree	Neutral/Not sure	Agree	Strongly agree

Digital technology issues in relation to other major issues for schools

Teachers and principals (as well as trustees and parents and whānau) were provided with a list of 25 issues for schools and asked to tick all those they considered to be major issues facing their school. Three items related to digital technology (shown in Table 6). The costs of maintaining and replacing digital technology was the most frequently identified major issue related to digital technology, more so than the adequacy of digital technology and internet access. Issues around inappropriate use of technology were not often identified as being major issues.

TABLE 6   **Views of digital technology as a major issue for respondents' schools**

Major issue	Principals (*n* = 200) %	Teachers (*n* = 771) %	Trustees (*n* = 176) %	Parents (*n* = 504) %
Costs of maintenance and replacement of digital technology	52	35	19	7
Adequacy of digital technology and internet access	20	29	11	5
Dealing with inappropriate use of technology (e.g. cellphones, social networking sites)	8	7	2	2

To put these issues in context, amongst principals, the costs of maintaining and replacing digital technologies was the second most frequently identified major issue (52%), after the general issue "too much is being asked of schools" (53%). Amongst teachers, the cost of digital technology was the third most frequent issue (35%), coming in just behind "too much is being asked of schools" (46%) and "staffing levels/class size" (37%).[16]

The full list of major issues, which includes various issues related to student achievement, teacher professional development, engagement with community and whānau, and other issues will be discussed in the forthcoming overview report of the 2016 national primary and intermediate schools' survey.

Bring your own device (BYOD)

Principals were asked if their school already has, or is considering, a BYOD policy. Just over half the principals said they either already do, or are considering one. Just under half said no. There were decile-related differences in their responses, with a higher proportion of decile 5–6, 7–8, 9–10 schools having a BYOD policy compared to decile 1–2. Of principals from decile 1–2 schools, 64% said their school has no BYOD policy, and 25% are considering one.

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16 Generally, school trustees identified digital technology issues less often, compared with other issues such as property maintenance/development, staffing/class sizes, funding, and other governance issues. Parents/whānau rated digital technology as an issue less often than staffing levels/class size, student behaviour, and various other issues.

TABLE 7   **Schools with BYOD policy, reported by principals (*n* = 200)**

BYOD policy	Principals %
Have a BYOD policy	31
Considering one	20
Do not have a BYOD policy	49

Because of the way the question was asked, principals may have been answering in terms of whether or not the school had a written policy. With hindsight, we could have asked whether the school allows students to bring their own devices to school, as well as whether the school has a policy in place around this.

Further support for teachers

Just over a third of teachers wrote a comment about additional support they needed to integrate digital technology for learning into the curriculum. These comments provide further insight into the everyday challenges and issues teachers encounter with regards to using digital technologies for learning and teaching. There were two very frequent themes in the comments. The first theme referred to issues with access, suitability, and reliability of hardware and infrastructure available, often coupled with comments that schools needed more/additional funding to get sufficient digital technology and keep this up to date. The second common theme related to teachers' perceived PLD support needs.

TABLE 8   **Teachers' comments about additional support needed (*n* = 265)**

Support needed	Teachers who wrote a comment (*n* = 265) %
(Funding for) Sufficient, up-to-date, reliable hardware (including a device for every student) and infrastructure	36
Ongoing support from external expertise/more funded PLD/concerned about teachers' preparedness	33
Time to practise, explore possibilities, implement new ideas from PLD	13
Dedicated funded tech support and maintenance that meet the school's needs	11
Collaboration/problem solving with others—within school, or across local school cluster (some referred to the value of this; others wanted it but didn't have it yet)	9
Challenging to keep up with the rate of change	7
Teacher has had (or is having) appropriate support or PLD/No further external support currently needed	5
Teacher wants more guidance, including which apps / websites to use for which purposes; which hardware is best, etc.	5
Particular challenges/priorities related to teaching young students (NE–Y3)	5
Support for families and whānau to buy devices for BYOD and for using digital tech at home	5

Access, suitability, and reliability of infrastructure, and associated costs

Not enough devices

Some teachers said there simply weren't enough devices available for their students. Definitions of "not enough" ranged from "too few" devices to meet their students' needs, through to some teachers not having *any* devices available for students' use.

> Not enough iPads to be shared around. I have 2 iPads for 24 children.

> Our students have access to NO computers/tablets of any description. The only 'technology' available to them are cameras and a TV screen which can connect to teacher's laptop. Each teacher has a laptop but students are not meant to use them.

> We need more devices—computers, laptops, tablets in our class. Just having two makes it difficult.

Some teachers said that having to share a pool of devices across the school was a limiting factor.

> I would love to have more computers in our school so that if we needed them for learning they were available. I would use the computers A LOT more if I could rely on having them available.

> Limited number of devices restricts us. Growing school—devices shared over more classes.

How much is "enough"?

Teachers expressed different views about how much would be "enough" in terms of students' access to digital technology devices.

> [I would like] more computers i.e. 1 between 2 per class.

> We could always use more devices—1:2 isn't quite enough.

> To completely integrate, needs to be 1:1.

Some simply said it was a case of having "enough" to be functionally useful in the classroom.

> [By] access I do not mean I need 1:1 but the ability to integrate it in all areas and groups, rather than booking pods when available.

> I just need more easily accessible/readily available devices so I can easily integrate use into my programme. At the moment my 1:7 ratio isn't ideal.

Some teachers commented about the *types* of devices available. They suggested they would be able to make better use of technology if all students had the same or similar kinds of devices.

> In order to teach well using ICT at Year 3 and 4 I believe we need devices which are the same rather than a mixture of iPad and computer.

> We do not have a device per student despite attempting BYOD... We also have a range of devices—laptops, google docs, chrome books, macs, iPads—which do not all have the same programmes.

Equity and funding

It was common for teachers to say that schools needed "more funding" to equip them adequately for using digital technology for learning. Some made specific comments about the importance of equitable funding for all schools, and some said the Government should fund schools' technology needs rather than device costs being passed on to parents.

> Schools need more funding to have enough ICT available for all students—especially those who cannot afford it.

> [We need] more support for low decile schools to have digital classrooms. BYOD is not an option.

> I feel there is a need for funding to schools to help in having equitable resources for technology.

An equal amount of funding for every school in NZ to purchase and keep updated technology equipment needs to be looked at.

The cost of apps and resources, and keeping technology up to date

Some teachers talked about the costs associated with keeping pace with changing technologies, including the need to have "up-to-date" technology, both hardware and software.

A number of Apps for special needs children are expensive … times need to change and we should be given additional funds to purchase them.

Need more money to purchase good quality resources for the kids to use.

Some teachers suggested that dedicated funding for in-school or between-school technology support might reduce delays or frustrating issues that limited integration of technology for learning. Some said technical support within their school was inadequate or not available quickly enough for their needs.

Often digital problems are solved by other teachers and/or students quickly/timely rather than waiting to go through official channels—we have to solve them ourselves, as the designated leader is overworked, and under-resourced.

Financial constraints mean that the technical support is not regular and IT problems wait for help or to be fixed for a term or more.

We are very isolated so technology is hard to get. There are limited technicians (one electrician) with knowledge on our interactive boards etc…

When systems crash we can be 'out' for quite some time. Frustrating.

We need to update our class computers and other forms of digital technology as well. If computers are not reliable then staff are less inclined to use them, due to frustration. I use my own personal iPad because I got tired of the tablets the school had not working well.

Professional learning and development needs

Aside from hardware and infrastructure issues, the second major area of comment related to teachers' learning and professional development needs. Many comments simply said teachers needed "more" PLD.

Any support would be great, at the moment in our school we have been given nothing.

Teachers have not had any PD to use google docs or find short cuts on the drive and spend hours trying to figure things out.

Some teachers said they simply didn't know what support they needed yet, due to current inadequacy of access to technology.

Don't know at this point since we (junior teachers) do not [have] adequate technology at [the] moment. It is not until we have it that we will know what support we will need.

Some teachers discussed the need for support that was tailored to their needs, or "just in time", or giving teachers more time to experiment and explore things they had already begun to learn.

It's usually too quick [PLD], only done by experimenting + verbally which does not suit my learning style. Always find I am left hanging while someone in any workshop getting all the attention + help or/and technology lets us down.

I would prefer in-class mentoring over workshops and being told to try it out myself.

Release time for teachers to work in small groups for [professional learning] … or to observe the use of digital technology would be helpful. Funding seems to be tied specifically to platforms, e.g., Microsoft/Google.

> [I'd like] a support person to discuss next steps in e-learning, apps to use [that] I may not know or [have] thought of. Group discussions with support person to continue own development for future learning & skills needed.

> One day courses are useful—but sometimes, presenters have their own 'barrow to push' e.g., iPad focus, when in reality it is not a case of one tool fits all. Hard to know exactly what is most beneficial to put time, money, and energy into!

Others wanted very specific guidance on how to link technology affordances to their goals for teaching and learning, or to meet their particular students' needs.

> More PD on what works already for specific needs/goals.

> I think I need some help using it to differentiate learning.

> Additional support and planning around digital citizenship and cyber safety for teachers, students and parents.

Which apps should I be using?

Some teachers commented that advice and support to find appropriate software would be useful.

> I have a special needs boy and I feel there may be more programs available to support his learning.

> I don't know what I don't know. I always appreciate guidance and support in finding/identifying and using programs/apps/sites to support learning in new ways.

> I would like more PD on the sea of Apps and programs so I can make well considered choices for my year 3 class.

A few teachers mentioned wanting PLD that could at least help them catch up to students, or get ahead of students and what they might need.

> Some PD on making colourful/informative/interesting displays would be useful. The kids are better than me at this.

> Knowing the programs before the students.

> We are just scratching the surface of what we are able to do with technology now, new things are being introduced as reality and readily available on a regular basis. If this is the direction teaching and learning are taking then we need a massive PLD to help teachers and the teachers who are leading.

A small percentage of comments (about 5%) expressed teachers' happiness with their current levels of in-school support and PLD.

> Our school has had whole staff PD throughout the year in Google Docs & iPad apps (teachers released from classes to learn). It's been AWESOME.

> Have had considerable PD this year in apps and Google (docs) which has been very beneficial.

> We have great support with ICT—it is time consuming to set up, but once up and running—it's successful.

Summary

The findings in this chapter identify some of the infrastructure and support challenges teachers and principals encounter regarding the use of digital technologies within their schools. While internet connectivity appears to be good in most schools, and few teachers think their school's policies are too restrictive, some teachers and principals identified challenges accessing hardware or software that is suitable to their needs, at the times at which they or their students need it. The costs associated with keeping technologies up to date were a major concern for more than half of principals. Some principals and teachers raised questions about equity of access for schools or communities who cannot afford these costs.

While teachers and principals agreed that digital technologies can support students with special learning needs, some teachers disagreed that they have the knowledge and skills to support students who may depend on these technologies to access the curriculum.

While more than half the teachers indicated that they have the knowledge and skills they need to provide learning with digital technologies, and that their school has strong leadership for the use of digital technologies in teaching and learning, 20% of teachers disagreed with each of these statements, and some teachers identified specific professional learning and development needs they felt were not currently being met.

6

Teachers' use of digital technologies to support their own work and professional learning

The previous chapters have begun to develop a picture of how primary and intermediate schools are utilising digital technologies to support students' learning. But to what extent are teachers utilising digital technologies to support their own professional work, including extending their own learning and digital networks?

We asked teachers to indicate how often they use various online technologies to support their work and professional learning (see Figure 8). Most teachers say they often or sometimes use online technologies to download resources or collaborate with teachers in their school. It was somewhat less common for teachers to say they go online to ask teaching-related questions, share teaching resources, or collaborate with teachers from beyond their own school. Just under half said they never or almost never took part in online learning opportunities or contributed to online discussions about teaching. However, a small percentage (13%) said they did each of these things "often".

FIGURE 8 **How teachers use digital technology to support their work and professional learning (*n* = 771)**
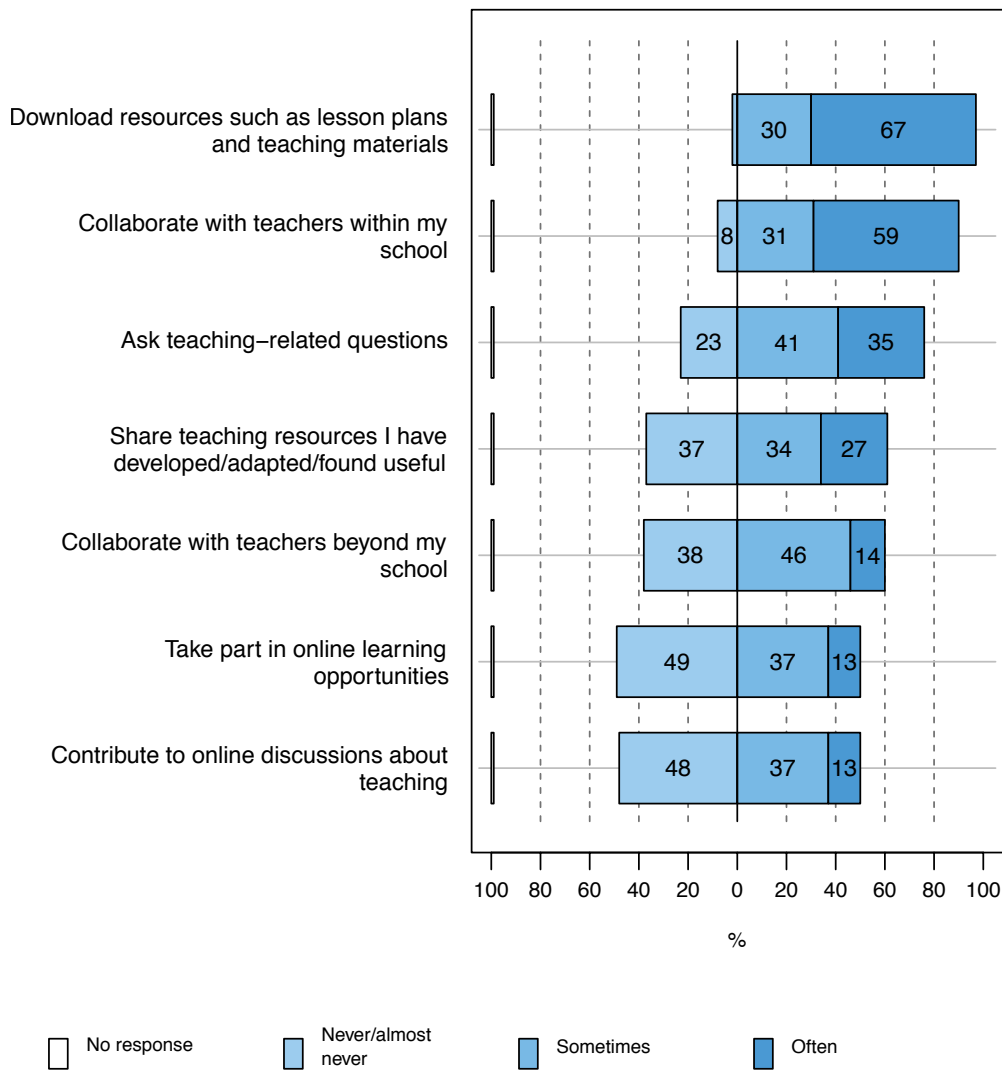
We also asked teachers to estimate how many people they regularly connect with online as part of their own professional learning networks (PLNs). A professional learning network (or personal learning network) usually involves an individual creating their own "network" of educators and other people from whom they seek advice, ideas, and resources to support their professional practice. It is important to note that PLNs can involve both online and offline relationships and communication. However, our question specifically asked about online connections, in order to investigate whether teachers were using the affordances of digital technology to connect and network more widely. As shown in Table 9, more than a third of teachers (37%) say they have no online PLN. Just under half (49%) say they regularly connect with between one and 20 people online as part of their PLN. Just 11% of teachers indicate an online network of more than 20 people.

TABLE 9   **Number of people teachers regularly connect with as part of their online professional learning networks (*n* = 771)**

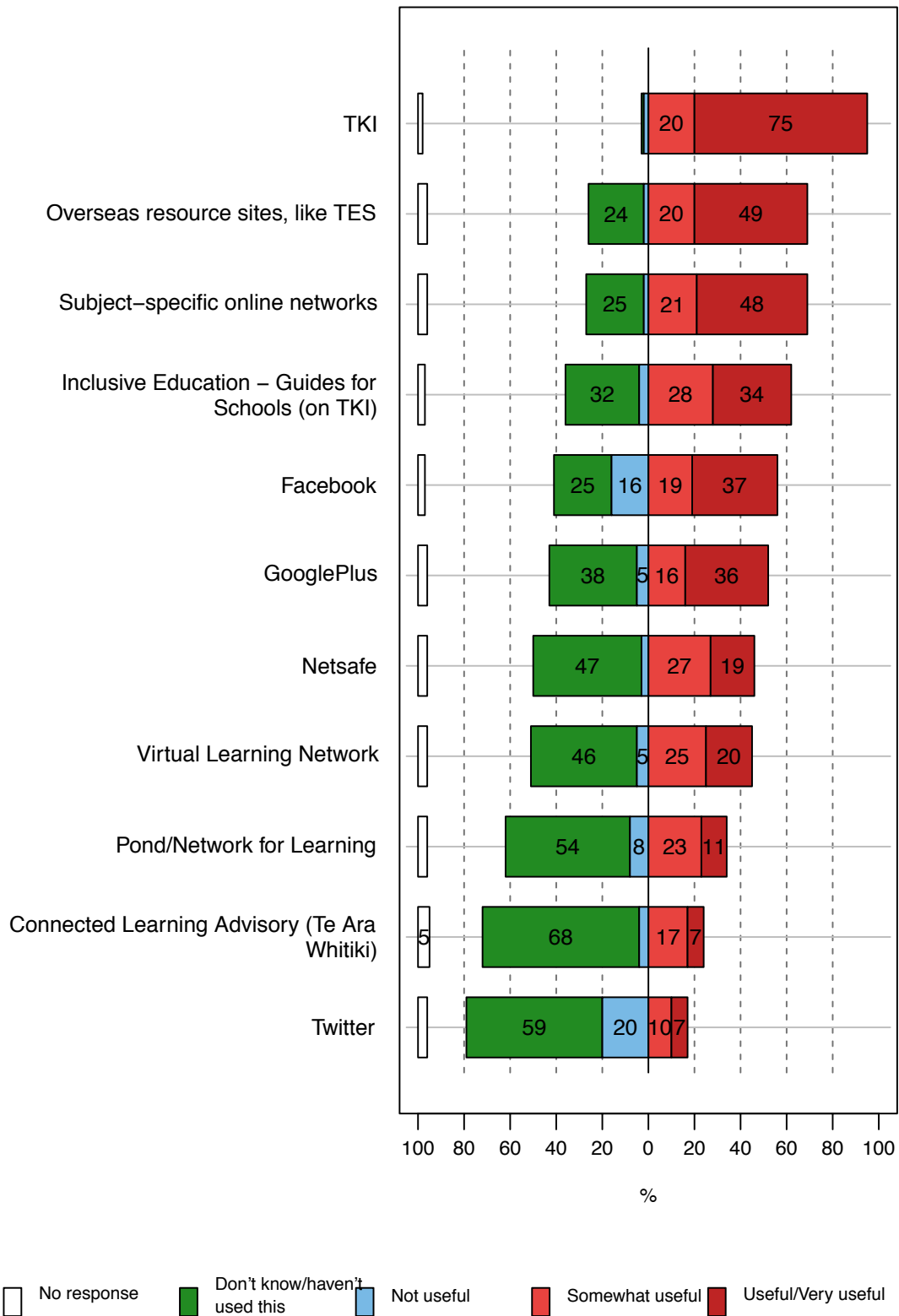| Number of people	Teachers %
None, no online PLN	37
1–20 people	49
21–50 people	7
More than 50 people	4

Online resources teachers use to support their work

We asked teachers to indicate how useful they found a range of websites and online resources in supporting their teaching. The list of sites and resources was compiled to include a range of key New Zealand-specific online resources developed or supported by the Ministry of Education, as well as a few common social media platforms that teachers might use to share or discuss teaching and learning (see Figure 9). The most useful sites, according to teachers, were TKI (75%), overseas resource sites (49%), and subject-specific online networks (48%). The next most useful sites or resources were Facebook (37%), Google+ (36%), and the Inclusive Education guides for schools on TKI (34%).

Most of the online resources shown in Figure 9 were deemed "not useful" by around 2%–5% of teachers. However, more teachers indicated three online resources they consider not useful: Twitter (20%), Facebook (16%), and Pond/Network for Learning (8%).

Aside from TKI, reasonably large proportions of teachers said they didn't know or hadn't used various online resources listed in Figure 9. Around a quarter said they hadn't used overseas resource sites, subject-specific online networks, or Facebook. Just under half didn't know or hadn't used Netsafe (47%) or the Virtual Learning Network (46%), and over half didn't know or hadn't used Pond (54%) or the Connected Learning Advisory (CLA) (68%). In the case of CLA and Netsafe, the key target audience for these services may be people within schools who have a leadership or decision-making role with respect to digital technologies, although both provide resources and advice that could be used by any teachers. In the case of Pond and VLN, both are intended to be for all educators, and provide spaces where teachers can find and share resources as well as discuss teaching and learning.

FIGURE 9 **Usefulness of selected online resources, reported by teachers (*n* = 771)**

Legend: No response | Don't know/haven't used this | Not useful | Somewhat useful | Useful/Very useful

45

Summary

The findings in this chapter suggest that most New Zealand primary and intermediate teachers use digital technologies to find resources and teaching materials, and to collaborate with colleagues within their schools. Teachers are less likely to go online to discuss teaching and learning or to seek out online professional learning, though a small percentage of teachers (13%–14%) do this often. If teachers have an online PLN, this most often involves connecting with between 1–20 other people on a regular basis, and more than a third indicated they have no online PLN.

Three-quarters of teachers find TKI useful for their teaching. Amongst other online resources and websites that teachers might be expected to use, there were quite a few teachers who hadn't used these sites or resources, or didn't think they were useful.

Why aren't more teachers using these online resources, or going online to seek out PLD opportunities? Is it a matter of time pressure, lack of awareness of the resources that are available, or a perceived lack of relevance or usefulness for teachers' needs? Are teachers content with the material they can find on TKI and therefore don't feel any need to utilise other resources? Are teachers' PLD needs and interests being sufficiently well-met by offline learning opportunities that they don't see value in seeking online professional networking and support? While our data cannot answer these questions, they could be useful discussion questions for teachers, school leaders, and those who seek to support teachers and schools online.

7

Parent and whānau views about learning with digital technology

The national survey includes parents and whānau. For pragmatic reasons, we did not ask every school in the sample to send out surveys to a sample of parents and whānau.[17] Instead, a subset of schools was selected from the main sample to approximately reflect the school decile and size characteristics of the sampling frame, and those schools were invited to take part in the parent survey by sending out the survey to the families or whānau of every fourth student on their roll. If a school declined the invitation, another school with the same decile and size characteristics was selected in its place. We contacted a total of 61 schools to achieve a sample of 36 schools taking part. However, only 31 schools returned parent and whānau surveys, with a total of 504 parents and whānau responses received.

The parent and whānau survey included a few questions about digital technologies. We asked parents how important it was to them that their child uses digital technology as part of their learning at school, and to comment on their answers. We also asked whether digital learning opportunities were a factor in choosing their child's school, or whether costs had ever prevented their child from various school activities including using a digital device at school. Finally, we asked whether parents accessed online information about their child's learning and school activities.

How important it is for their child to learn with digital technology at school?

Most parents (81%) said the use of digital technology as part of their child's school learning was of "high" or "medium" importance. Only 15% said using digital technology for learning was of "low importance" for their child's school learning (Table 10).

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17 Asking schools to send out surveys to parents and whānau places some additional burden on the schools as well as NZCER's national survey infrastructure, because additional time and follow-up is required in order to maximise the number of surveys returned. Those schools that are asked to survey parents and whānau are provided with a small koha for this additional request.

TABLE 10 **Parents' views on the importance of their child learning with digital technology at school (*n* = 504)**

Importance	Parents and whānau %
High	36
Medium	46
Low	15
Not sure	1

Parents were asked to comment on why they rated digital technology for learning as being of high, medium, or low importance. Eighty-eight percent of parents wrote a comment, a very high response rate to an open question. The most common themes in parent comments are shown in Table 11.

TABLE 11 **Parent and whānau comments about digital technology in their child's school learning**

Theme	Parents who wrote a comment (*n* = 442) %
Digital technology is ubiquitous: it's the way of the future; we're in a digital age	46
It's important to balance digital technology learning with other kinds of other learning (particularly with young children)	44
General tech skills are beneficial/important to students: need to be confident users; opens up opportunities; without it, they'll be left behind; need to know how to use it safely	37
Concerned about effects on students	7
The child already uses enough tech at home / outside school	4
Schools can provide equity of opportunity for students who can't afford digital technology at home	1

The most common type of comment (46%) was a variation on "digital technology is the way of the future", followed by comments about the need to balance digital learning with other non-digital learning, particularly in the first few years of schooling (44%).

> In the first few years at school I believe reading, writing, and maths need to be the foundation including writing in book. Technology is important as a tool to support learning once the foundations are mastered.

> Technology is useful for learning but I'm more interested in developing emotional literacy and relationship skills.

> Yes our children need technology, but I also feel that learning basic math, i.e., times table etc. should be 'old school'.

> Techno-wise kids love it and can develop tunnel vision as a result. We like a rounded approach.

Parents also talked about the future relevance of digital technology skills.

> Digital technology is very important due to its future requirements in subjects within secondary school. It is a fun way to learn and there are many educational online learning programs to complement traditional methods.

> To keep up in the 'real world' they need to be competent (at a minimum) with digital technology.

A few parents (7%) expressed specific concerns about potentially negative impacts for children, particularly on their eyes, bodies, and concerns about "addiction" or tunnel vision.

> Not good for children's eyes.

> I think children need to learn to read and write properly. Devices used by children can make them not very social and this can inhibit their communication skills.

> These things are addictive to adults so how come we are encouraging our children that 'they need them for homework and [to play] educational games'—that is surely what the developers want us to believe.

A small number of parents said their child already gets enough exposure to digital technology at home, while a handful noted that schools could provide equity of opportunity for students who were not able to access digital technologies at home.

Digital technology as a factor in choosing a school

Only 8% of parents and whānau indicated that digital technology opportunities were one of the specific factors in choosing their child's school. This is perhaps not surprising compared with much more common reasons for choosing a school, such as having an older child or family member at the school (54%), what other families have said about the school (39%), where their child's friends are going (30%), or the child themselves wanting to go there (28%). However, even amongst other specific programmes and offerings in which a school might have strengths, digital technology opportunities were a less common factor than sports and physical activities (19%), environmental projects (13%), cultural inclusiveness and arts programmes (each 12%), and te reo Māori / tikanga Māori (10%).

Do parents access online information about their child's schooling?

We also asked parents and whānau if they have online access to various kinds of information about their child's schooling (Figure 10). More than half (60%) say they can access information about school events and trips online, over a third (37%) say they can access online information about what sorts of things their child is doing in the classroom (including videos or blogs), and 34% can see work that their child wants to share online. Fewer say they can view information about their child's attendance or lateness (15%) or assessment results (13%) online.

FIGURE 10 **Online information parents can access about their child's learning and schooling (*n* = 504)**
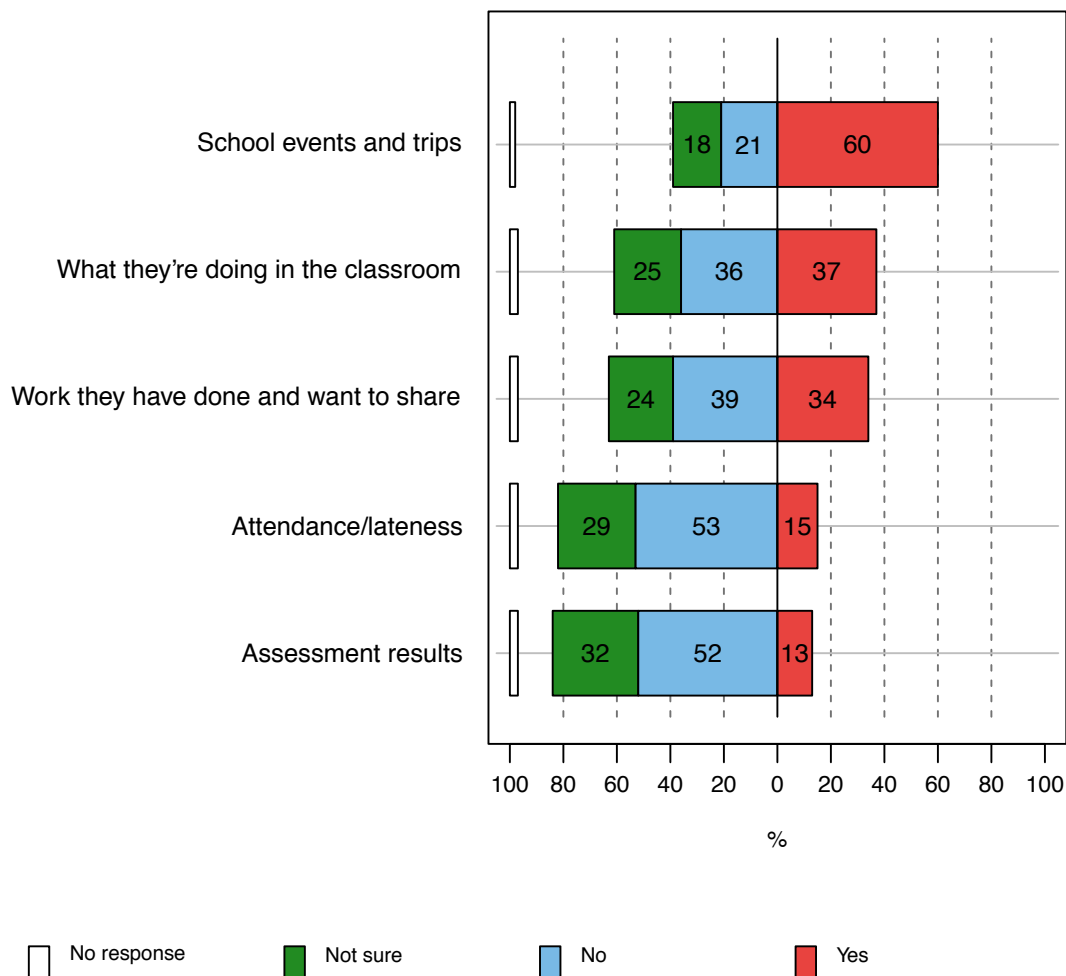
A decile-related difference was evident in two items. Seventy-eight percent of parents from decile 9–10 schools said they had access to online information about school events and trips, compared with 46% of parents from decile 1–2 schools. Regarding accessing online information about what students are doing in the classroom, 27% of parents from decile 1–2 schools answered yes compared with 52% of parents from decile 9–10 schools.

Overall, 69% of parents/whānau answered yes to at least one of the items in Figure 10. We asked them to identify how they accessed this information (Table 12). This was most often done via a home computer or laptop, although over half (56%) did so on their mobile phones.

TABLE 12   **Devices used to access online information about child's schooling**

Device	Parents and whānau who access online information about their child's schooling (*n* = 350) %
Home computer/laptop	85
Mobile phone	56
Work computer/laptop	19
Other	9

Summary

Most of the parents and whānau who responded to the national survey indicated that it is important for their children to have opportunities for learning with digital technology at school, though this is not the most important factor in choosing a school. Parents and whānau see digital technologies as being ubiquitous and "part of the future", but also value their children having a balance of other learning activities and opportunities. Some parents and whānau have online access to information about their child's school learning. This is more likely to be information about school events and trips than about what's happening in the child's classroom or work children have done that they want to share. Few parents indicated that they can access online information about their child's achievement or attendance.

Discussion

Overall, data from the 2016 national survey of primary and intermediate schools presents a complex picture regarding the role and impact of digital technologies for learning and teaching. In terms of infrastructure, most schools now have reliable internet access, but many still have some challenges in terms of students having sufficient access to digital devices for learning. Many principals consider the ongoing costs of maintaining and upgrading digital technologies to be a key issue.

In terms of the use of digital technologies for teaching and learning, the most common digital learning practices tend to involve various kinds of digital document production, skill practice, and/or research on the internet. Other practices that involve students using emerging digital technologies to create multimedia or code/program are less common, as are co-curricular opportunities to engage with makerspace activities or student gaming/coding clubs. These findings mirror the general patterns identified in previous national surveys of both primary/intermediate and secondary schools, with document production and internet research remaining the most common uses for digital technology in the classroom. Interestingly, many teachers seem keen on the idea of students using technology to communicate, collaborate, or share their learning beyond school walls, although this doesn't currently happen often in most classrooms.

Teachers and principals generally hold a positive view of the impact of digital technologies on student engagement, attitudes, and achievement, though additional data would be necessary to substantiate these views. Teachers also tend to think that digital technologies give students greater control over their learning and can support students with additional learning needs. Both principals and teachers indicate that pedagogies are changing as a result of digital technologies.

In terms of their own professional work, most teachers use digital technologies to find and retrieve teaching resources, some go online to ask questions or discuss their professional practice, and a smaller proportion seek out opportunities for online PLD or actively build their own online PLN. TKI is one of the most used and useful go-to resources for teachers, while fewer teachers are using a range of other online resources specifically designed to promote reflection, networking, sharing, and discussion amongst New Zealand educators. While some teachers think digital technologies have pushed the working day further into their own time, very few thought that the use of digital technologies for learning was too time-consuming for the benefits gained.

Questions to consider

Some of the survey results raise further questions which may be valuable points of discussion for school leaders, teachers, policy makers, boards of trustees, and parents/whānau in making ongoing decisions about the integration of digital technologies for learning in schools around New Zealand.

Infrastructure and equity

- What system-level policies and investments can help to ensure equity of access and support so that all students, at all schools, can benefit from learning with digital technologies?
- What ongoing system-level policies and investments might support greater efficiencies and/or reduce costs to schools with regards to investment and maintenance of digital technologies for learning?
- What helps school leaders make good decisions regarding investment in, and maintenance of, digital technologies, particularly as technologies and needs change over time?

Benefits and impacts of learning with digital technologies

- The prevalent view amongst teachers, school leaders, and parents/whānau was that using digital technologies for learning is generally beneficial for most students. Are adults and students able to articulate why and how digital technologies might strengthen or enable different, or better, kinds of learning opportunities? What new insights can arise when ideas about learning with digital technologies are critically examined in schools and communities?
- When talking about the future of learning, teaching, and curriculum, is there a risk of focusing too much on digital technologies, and not enough on wider questions about learning and teaching? For example, what supports teachers and students to be powerfully engaged and transformed as learners and practitioners, and how might digital technologies be used to create or support these conditions for learning in schools?

The use of digital technologies for learning

- Aside from document production and internet research, why aren't teachers and students more often engaging in learning activities involving the use of digital technologies to create, connect, and share learning, and/or things that can only be done with digital technologies?
- The survey results suggest many teachers would like their students to be using digital technologies to connect, communicate, and collaborate in their learning with people beyond school walls. If so, why wasn't this happening more often? What support is available for teachers who want to get these things happening in their schools and classrooms?
- Why were learning activities such as coding/programming, gaming clubs, or makerspaces still relatively uncommon in primary and intermediate schools?
- What other kinds of valuable digital learning opportunities might be happening in schools that we were not easily able to pick up through our survey questions?
- How are innovative and effective digital learning and teaching practices developed and shared within schools, and between schools?

The inclusion of digital technologies in the curriculum

- How can school leaders and teachers design learning opportunities with digital technology that reflect the needs of their community and align with their local curriculum?
- What are the advantages and disadvantages of thinking about digital technology as a tool? Are there other metaphors (other than the tool metaphor) for thinking about digital technologies which might assist schools to think creatively about the way teachers, leaders, and students use digital technologies for learning?
- How does, or could, digital technologies be used to enact the vision, principles, and key competencies in *The New Zealand Curriculum*, alongside learning objectives associated with the technology learning area and other learning areas?

Teachers' own use of digital technologies

- How are teachers learning, reflecting, and refining their practices around learning with digital technologies, both online and offline?
- Why aren't more teachers utilising various online resources designed to support reflection, networking, sharing, and discussion amongst New Zealand educators? Does it matter?
- Is face-to-face and in-school professional learning and collaboration meeting teachers' professional learning and development needs so well that they do not need to seek out additional online learning or professional learning networks?
- What other factors might limit the extent to which teachers go online for professional reflection, support, or advice? For example, is it related to time constraints, familiarity with platforms and resources that may be useful, or comfort levels with operating in the online environment?
- To what extent does teachers' own use of, interest in, and comfort with using digital technologies in their personal and professional lives enhance or diminish the kinds of learning opportunities they can provide or support for their students?

These questions, and additional questions arising from the data in this report, may be useful in supporting ongoing conversations about the future of learning with digital technologies in New Zealand schools. School leaders and teachers can also find further guidance, support, information, and discussion forums relevant to many of these questions through the Connected Learning Advisory / Te Ara Whītiki service.[18]

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18 See http://elearning.tki.org.nz/Ministry-initiatives/Connected-Learning-Advisory-service