

4.

Learning with digital technology²⁶

Given the high priority the Government has placed on learning with digital technology, there are many questions worth asking. How is digital technology being used for learning in New Zealand secondary school classrooms? What opportunities do students have to learn with digital technology? Do these opportunities involve using technology to re-package existing pedagogies, or are there signs that digital technology is being used in innovative ways that involve pedagogical transformation? Are students using online technology for working collaboratively—are they really “connected”? As well as identifying what is happening at the classroom level, we were interested to find out how BYOD policies were playing out in schools and—importantly—how they might be related to students’ access to learning with digital technology.

We asked teachers and principals about students’ learning experiences with digital technology in the classroom. We asked parents and whānau about the importance they placed on their children having opportunities for learning with digital technology, and about their role in providing a digital device.

Many of our questions about learning with digital technology were new questions that have not been asked in previous national surveys. Developing survey items and response options in a sometimes fast-moving space that can capture a rich and relevant picture of current practice can be challenging. As we will see throughout this chapter, some of the items we used for the first time in 2015 achieved our purposes better than others.

²⁶ We thank Rachel Bolstad at NZCER for her helpful advice and feedback on the learning with digital technology component of the National Survey.

The Government's digital strategy prioritises schools having state-of-the-art infrastructure (including reliable high-speed broadband and fully-funded uncapped data), 21st century teaching and learning and equitable access to quality content and resources (Kaye, 2015²⁷). Aiming for a co-ordinated, system-wide shift towards these goals, 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, that provides free advice to schools on how to incorporate digital technology into teaching and learning, and the Virtual Learning Network (VLN), that supports teachers to connect and collaborate with colleagues online. VLN also 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 (e.g., IEA, 2013;²⁸ OECD, 2015²⁹) 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 from 1999 until around 10 years ago. The programme aimed to increase teachers' pedagogical understandings of ICTs in order to support effective classroom teaching and improve student achievement. More recently, Ministry-funded providers such as Te Toi Tupu have 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.

In a November 2015 speech,³⁰ the Associate Minister of Education, Nikki Kaye, said the Government had decided to "make digital fluency a national priority for professional development from 2017" (p. 4), suggesting the Government intends a concerted focus on PLD for teachers once the infrastructure is in place across the country.

Against this backdrop, we wondered if the survey responses would capture a picture of schools that are now well equipped with hardware and infrastructure, and whose teachers are looking for PLD to help them transform what is happening in their classes, rather than simply using digital technology as an alternative delivery mode for existing learning activities. Aware of particular initiatives in low-decile schools, such as the Manaiakalani cluster,³¹ aimed at building teachers' digital pedagogies, we were interested to see what school decile-related differences might emerge from the data.

School infrastructure and support for using digital technology

Ninety-five percent of principals indicated their school's ICT network had been upgraded for ultra-fast broadband. Smaller proportions said their school had adequate expertise (61%) or adequate resources (46%) to support good-quality learning with digital technology. ICT technical support was being undertaken by teachers who were funded over entitlement³² in 15% of secondary schools. Most principals (74%) indicated they can readily access external expertise to keep developing e-learning at their school.

27 Kaye, N. (2015). *Speech to Bett Asia Leadership Summit 2015*. Downloaded 19 November 2015, from <https://www.beehive.govt.nz/speech/speech-bett-asia-leadership-summit-2015>

28 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

29 Organisation 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

30 The text is available at: <https://www.beehive.govt.nz/speech/speech-bett-asia-leadership-summit-2015>

31 See Hipkins, R., Whatman, J., & MacDonald, J. (2015). *Evaluation of the Manaiakalani Digital Teaching Academy*. Wellington: New Zealand Council for Educational Research. Retrieved 25 March 2016, from <http://www.nzcer.org.nz/research/publications/evaluation-manaiakalani-digital-teaching-academy>

32 Each year, school boards receive entitlement staffing from the Ministry of Education, based on school roll numbers. Teachers who are "funded over entitlement" are those who boards fund in other ways.

A BYOD policy was in place at 62% of schools. In 40% of these schools, the whole school was BYOD, with device type(s) unspecified. Slightly more (44% of schools with a BYOD policy) were in the process of rolling out their BYOD policy one year group at a time. A small group of schools (7%) had a school-wide BYOD policy with device(s) specified. For 54% of principals of schools with BYOD policies, the inability of parents and whānau to buy a device for their child was a barrier for a small number of students. Twenty percent reported this was a barrier for a large number of students. For a further 24%, this was not a barrier at all.

Of the 37% of schools with no BYOD policy, 58% provided digital devices that students share (e.g., in a computer lab or spread around the school). Principals of a further 22% of schools without BYOD policies indicated they are still considering how to implement digital devices for learning at their school.

Whether or not a school had a BYOD policy varied with school size. Large schools were more likely to have a BYOD policy in place (81%, decreasing to 36% for small schools).

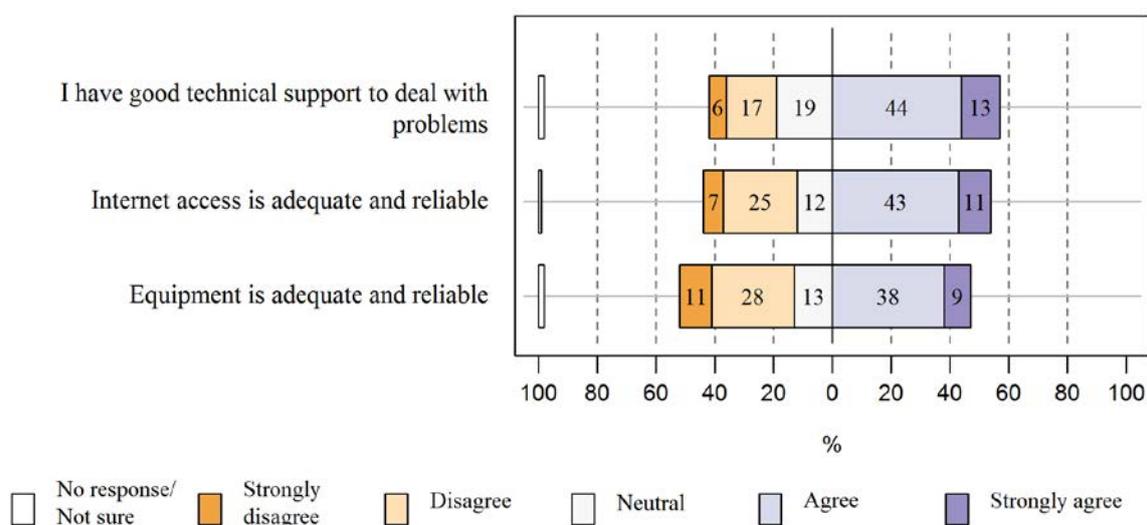
There were some decile-related differences. Principals of low-decile schools were more likely to report that at their school:

- the inability or unwillingness of parents and whānau to buy a device for their child was a barrier for a large number of students (88% of principals at decile 1–2 schools, decreasing sharply to 3% for decile 9–10 schools)
- there is adequate expertise to support good-quality learning with digital technology (60% for decile 1–2, and 43% for decile 3–4, increasing to 72% for decile 9–10 schools).

Forty percent of principals at decile 1–4 schools reported a BYOD policy was in place, increasing to 83% of those of decile 9–10 schools. Principals at three decile 1–4 schools (12% of schools in this decile range) reported having lease-to-buy schemes in place.

We asked teachers about the practical support they have for using digital technology for learning (see Figure 8). Over half the teachers agreed or strongly agreed they have the practical support and Internet access they need to implement learning with digital technology, with fewer (47%) reporting the equipment they have is adequate and reliable.

FIGURE 8 Teachers' views of practical support for using digital technology for learning (n = 1,777)



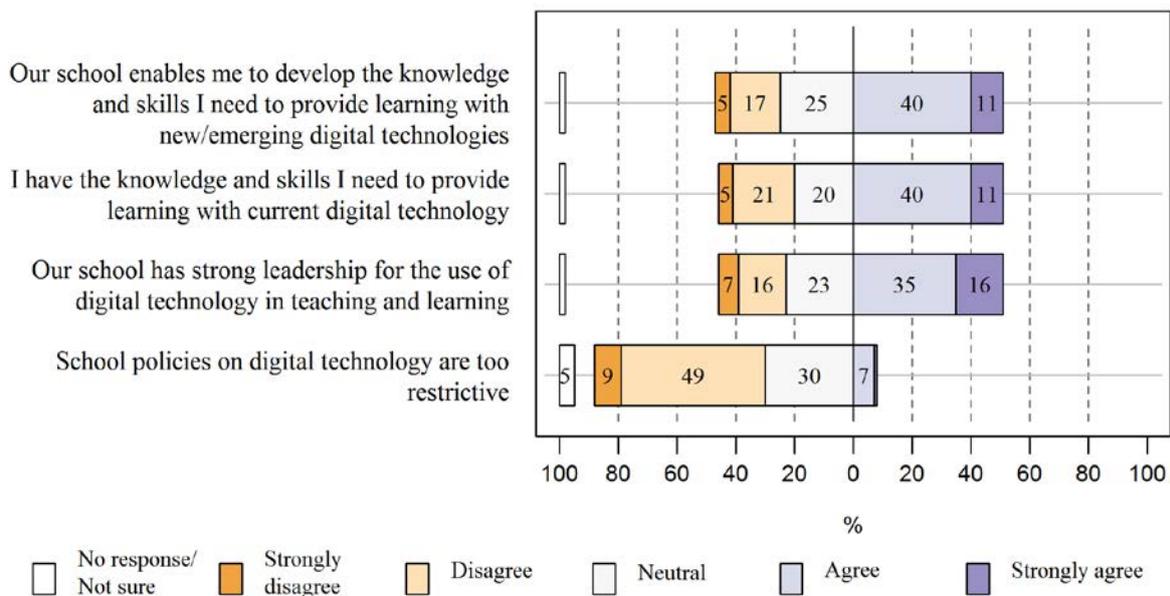
Teachers at high-decile schools were more likely to report having adequate and reliable equipment and good technical support than teachers at low- and mid-decile schools. For example, 51% of teachers at decile 1–6 schools reported having good technical support to deal with problems, compared with 64% of those at decile 7–10 schools. School size was also a factor, with more teachers at large schools (69%) reporting they have good technical support, compared with all other schools (53%).

In the 2012 survey, 53% of teachers agreed or strongly agreed that student use of ICT for learning in their classes doesn't happen because equipment/access is too slow/unreliable/of insufficient quantity. Although the same question was not asked in 2015, the responses in Figure 8 suggest a slight improvement in this situation.

Support for teachers to implement learning with digital technology

Just over half the teachers agreed they had the conditions needed to implement learning with digital technology (see Figure 9). Few teachers thought that their school policies on digital technology were too restrictive.

FIGURE 9 Teachers' views of implementing learning with digital technology (n = 1,777)



There were no decile-related differences in teachers' reports of adequate, reliable Internet access or their having the knowledge and skills they need to provide learning with current digital technology. However, teachers in decile 7–10 schools were more likely to agree or strongly agree their school has strong leadership for the use of digital technology in teaching and learning (61%, compared with 43% of teachers in decile 1–6 schools). Teachers at high-decile schools were also more likely to agree or strongly agree their school enables them to develop the skills and knowledge they need to provide learning with new/emerging digital technologies (57% for decile 7–10, compared with 45% for decile 1–6 schools).

Less experienced teachers were more confident they have the knowledge and skills needed to provide learning with digital technology; 72% of teachers with less than 3 years' experience agreed, decreasing to 43% of teachers with at least 15 years' teaching experience. Unsurprisingly, the trend according to teachers' age closely mirrored this, with teachers under 30 years most likely to agree they have the knowledge and skills needed for this.

Students' access to digital technology

As Table 11 shows, teachers most frequently reported their school provides devices that students share. Just over half the teachers indicated their schools were (also) BYOD schools, with close to two-thirds indicating students can use their BYOD devices in the courses they teach. Very few teachers reported their school providing all students with devices. Half of the "Other" responses were comments that BYOD is still being introduced across the school.

TABLE 11 Students' access to digital technology at secondary schools

Access	Teachers (n = 1,777) %
The school provides devices that students share (e.g., in a computer lab, or spread around the school)	72
Students can use their BYOD devices in the courses I teach	65
We are a BYOD school	53
The school provides devices that are used only in some courses	15
Other	8
The school provides each student with a device	2

There were decile-related differences reflecting more restricted access to digital technology for students at low-decile schools. Echoing principals' responses, teachers in decile 1–2 schools were also less likely to report their school is a BYOD school (24% for decile 1–2, increasing to 66% for decile 9–10), or that students can use their BYOD devices in courses they teach (43% up to 72%, respectively). Because fewer students at low-decile schools had their own digital devices, these schools were more likely than high-decile schools to provide:

- shared devices (85% for decile 1–2, decreasing to 56% for decile 9–10 schools)
- devices for use only in some courses (25%, compared with 9%)
- each student with a device, though this was uncommon (7%, decreasing to less than 1%).

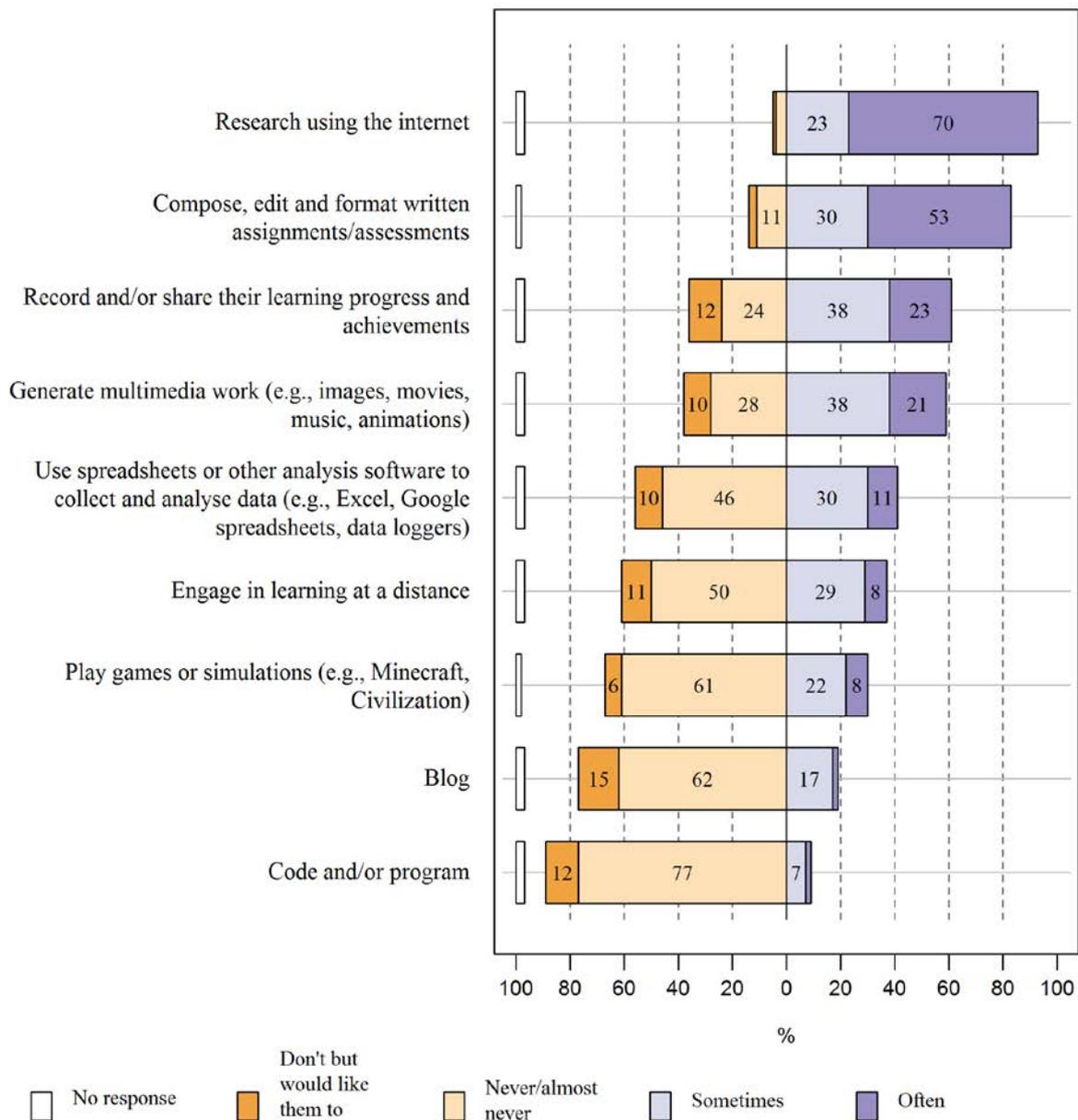
Providing learning experiences with digital technology

Teachers responded to a set of statements to indicate the sorts of learning experiences they were providing in their classes that involved digital technology. While this gives a broad picture of the opportunities students have for learning with digital technology, it does not tell us about the nature of the pedagogy surrounding these practices.

Figure 10 shows teachers' reports of how often students used digital technology for a variety of learning experiences. Using the Internet for research and developing pieces of written work were the most frequent learning experiences, and probably two of the most well-established uses of digital technology. Least frequent practices were coding or programming and blogging.

Since 2012, the proportion of teachers indicating their students sometimes or often use spreadsheets or other analysis software to collect and analyse data had decreased noticeably from 65% to 41% in 2015. The proportion of teachers reporting their students sometimes or often generate multimedia work increased from 48% in 2012 to 59%. There seem to be no obvious explanations for these changes.

FIGURE 10 Learning experiences using digital technology, reported by teachers (n = 1,777)



The only clear decile-related association here was that teachers at decile 1–2 schools were more likely to report their students playing games or simulations (45% responded “often” or “sometimes”, compared with around 30% for all other decile bands).

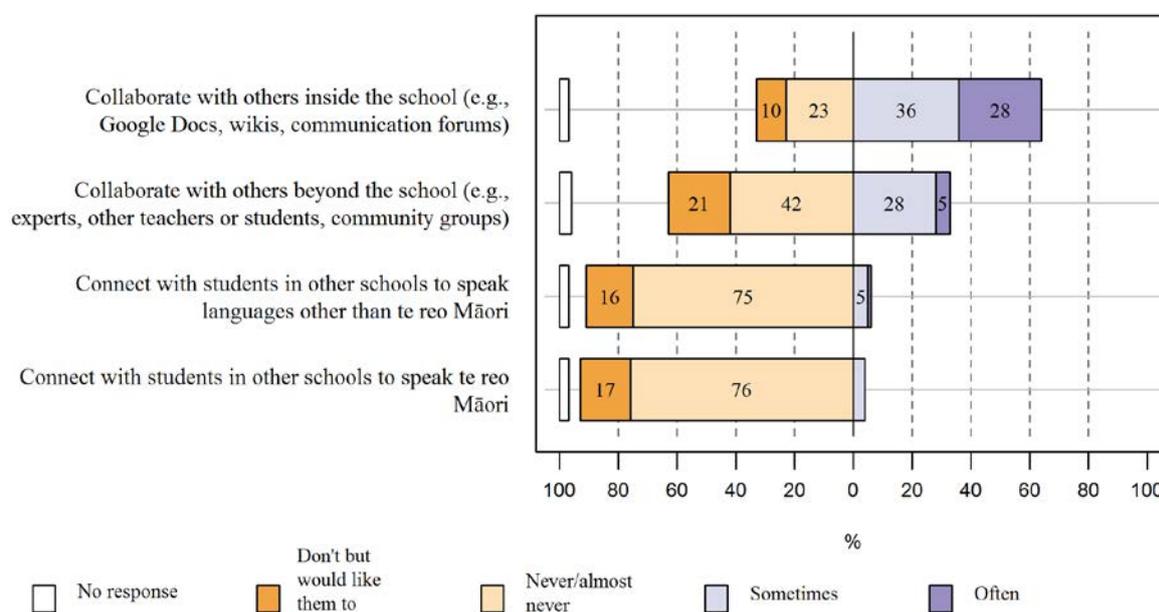
Some unsurprising subject-group differences were evident. Students of English or Languages were most likely to use digital technology to compose, edit and format written assignments/assessments (72%). The subject areas in which students were most likely to sometimes or often use spreadsheets or other analysis software to collect and analyse data were Mathematics and Science (60%). On the other hand, Mathematics and Science students were the least likely to use digital technology to: research using the Internet; produce written assignments; record their learning progress; generate multimedia work; or blog.

According to the 65% of principals who indicated students at their school used distance learning,³³ a median of 5% of students per school used digital technology to engage in learning at a distance (e.g., with an e-teacher). Of this group of principals, 51% said students used VLN for distance learning, 27% used other options (including Te Kura, Google and Office 365) and 8% used online te reo Māori programmes. Massive Open Online Courses (MOOCs) and English Language Learning in New Zealand (ELLINZ) were each used for distance learning by 5% or fewer schools using distance learning. Seven percent of this group of principals did not specify the online platforms their students were using.

The use of digital technology for distance learning was associated with school size. Thirty percent of medium–large and large schools had more than 10% of their students doing this, compared with 13% of smaller schools.

We asked teachers how often students used digital technology for collaborating and connecting with others. We included items about connecting with students in other schools to speak te reo Māori, in particular, to contribute to an overall picture of approaches that are being used to re-vitalise te reo Māori. Nearly two-thirds of teachers reported students using digital technology to collaborate with others at the school, and one-third to collaborate with people beyond the school (see Figure 11). Very little use was being made of digital technology to connect with students in other schools to speak te reo Māori (4%) or other languages (6%). Close to one-fifth of teachers indicated they would like their students to use digital technology to collaborate with others beyond the school, or to connect with other students to speak languages other than English.

FIGURE 11 **Students collaborating and connecting with others using digital technology, reported by teachers (n = 1,777)**



Looking at teachers' responses according to school decile, 59% of those at decile 1–2 schools reported their students using digital technology to collaborate with others inside the school, increasing to 75% for decile 9–10. There was a trend for teachers at decile 1–2 schools to be most likely to indicate they do

33 We cannot tell from the survey whether this means 35% of principals have no students using digital technology for distance learning or whether they might have been uncertain what proportion of students do so.

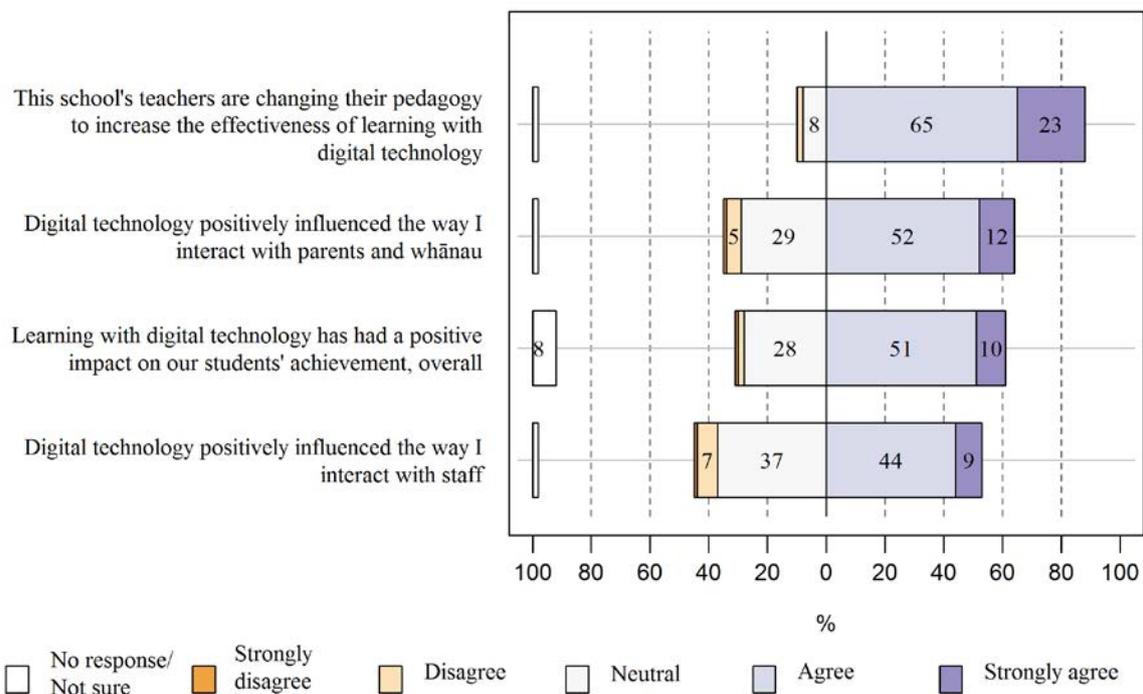
not use digital technology for these purposes, but would like to. For example, 27% of teachers at decile 1–2 schools said they did not use digital technology for their students to connect with students in other schools to speak te reo Māori, but would like to, compared with 14% of those at decile 9–10 schools.

Teachers were also asked how often they use online technologies themselves to collaborate with colleagues in their school and beyond; 85 and 60%, respectively, reported sometimes or often doing so. The nature of what teachers interpreted to be “collaborating” is unknown; for example, these might range from email conversations with another teacher about a student’s learning, to adding comments to an online discussion, to working with several colleagues to develop and revise a joint document online.

Effects of learning with digital technology

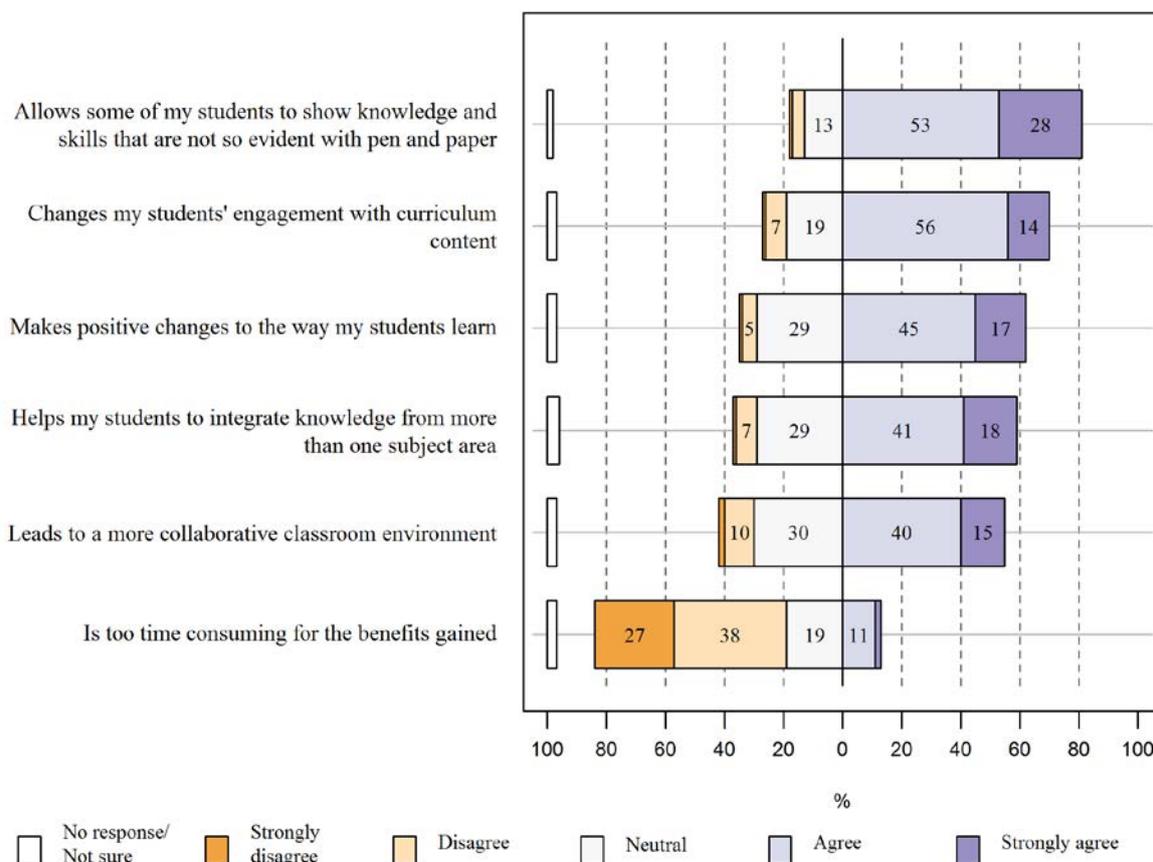
More than half the principals were positive about the effects digital technology was having at their school (see Figure 12). The majority agreed their school’s teachers are changing their pedagogy to get the most out of learning with digital technology. Over half the principals thought that digital technology was positively influencing the way they interact with parents and whānau, and staff. Many also reported a positive impact on students’ achievement.

FIGURE 12 Principals’ views of the effects of digital technology at their school (n = 182)



The responses summarised in Figure 13 show that teachers generally also thought that students gained from their use of digital technology. Few thought that using digital technology for learning was too time consuming for the benefits gained.

FIGURE 13 Effects on students of using digital technology for learning, reported by teachers (n = 1,777)

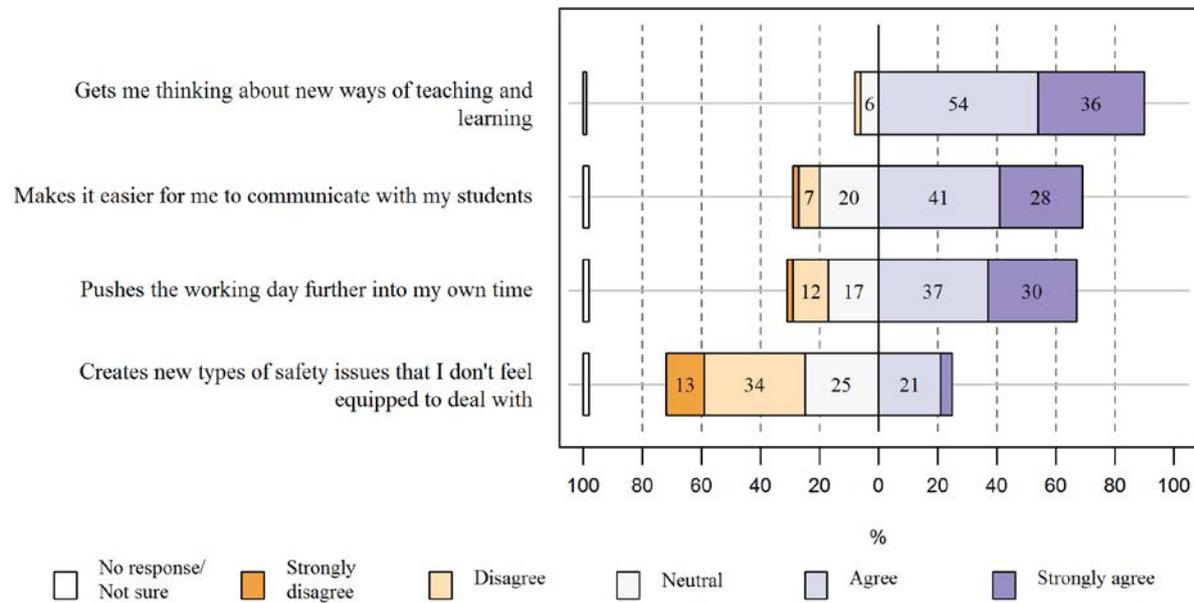


Compared with 2012, there was a slight decrease in the percentage of teachers agreeing that students' use of digital technology helps students to integrate knowledge from multiple subject areas (down from 64% to 59% in 2015). Slightly fewer teachers in 2015 agreed it is too time consuming for the benefits gained (down from 16% to 13%).

Teachers' agreement that digital technology helps students integrate knowledge from more than one subject area was associated with decile; 73% of teachers in decile 1–2 schools agreed, decreasing to 54% of those in decile 9–10 schools.

Students' use of digital technology was getting the majority of teachers thinking about new ways of teaching and learning (see Figure 14). Just over two-thirds of teachers agreed or strongly agreed that students using digital technology makes it easier for them to communicate with their students. However, a similar proportion indicated it pushes the working day further into their personal time. This last point was associated with school decile, with 56% of teachers in decile 1–2 schools agreeing or strongly agreeing, increasing to 72% of those in decile 9–10 schools. This difference is probably linked to students at high-decile schools being more likely to generally be more digitally connected.

FIGURE 14 Effects on teachers of using digital technology, reported by teachers (n = 1,777)

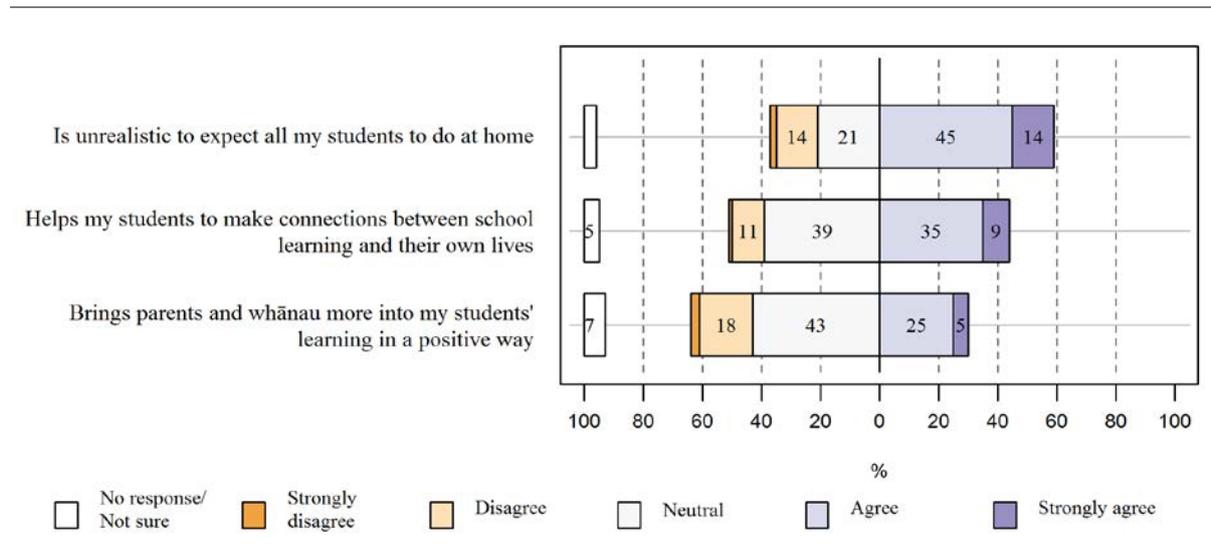


Teachers at high-decile schools were more likely to report new types of safety issues, which they did not feel equipped to deal with, created by students' use of digital technology (29% for teachers in decile 9–10 schools, decreasing to 20% for those in decile 1–2 schools). However, fewer teachers indicated new safety issues they are not equipped to deal with in 2015 (33% in 2012, compared with 25% in 2015).

There was a slight increase from 2012 in the proportion of teachers who agreed they were thinking about new ways of teaching and learning (83% in 2012, 90% in 2015). Also slightly increased was the proportion who agreed that students using digital technology pushes the working day into their own time (62% in 2012, 67% in 2015).

The teacher survey also included questions about the connections between learning at school and at home. Over half the teachers agreed or strongly agreed that it is unrealistic to expect all their students to use digital technology for learning at home. Less than half agreed or strongly agreed that using digital technology was helping students to make connections between school learning and their own lives, or that it brings parents and whānau more into their students' learning in a positive way. It is worth noting the comparatively large proportion of neutral responses to two of these items.

FIGURE 15 Effects on home-school connections of using digital technology for learning, reported by teachers (n = 1,777)



Teachers' comments

Just over half the teachers wrote a comment about their experiences with using digital technology for learning. Although they also made positive comments, more typically, teachers highlighted concerns about using digital technology for learning. Thirty-nine percent of their comments described issues with their school's provision of digital technology for learning. Twenty-eight percent of teachers' comments identified a need for PLD, and more time, to enable them to embed the use of digital technology in their teaching practice. Table 12 shows how their comments were categorised and is followed by illustrative examples, some of which include several themes.

TABLE 12 Teachers' comments about using digital technology for learning

Themes	Teachers (n = 930) %
Issues with school provision of digital technology, technical support and leadership	39
More/better PLD needed, including more time	28
Concerns about negative effects on students' learning and wellbeing of digital technology	18
General positive comment	17
Pedagogical change needed	14
Issues around BYOD and students' access to digital technology at home	13

Teachers' comments about issues with schools' provision of digital technology, technical support and leadership included:

Access to equipment is far too limited. Some subjects are booked/timetabled into computer rooms, which HUGELY restricts access for other classes. I am lucky to get 1 or 2 lessons a term with computers at all.

Need more than 1 computer technician onsite to keep up with 1,200 demands.

Our school is at the beginning of a major overhaul of how we see/use digital technology in the classroom—the plan is to use it widely in all areas of the school; however there does not appear to be a shared goal & no strategic plan as to how to get there! It is rushed & ad hoc.

The following comments are illustrative of what teachers said about the adequacy of PLD, in particular, the time they needed in order to become familiar with technical aspects of digital technology:

Our school has rushed in Office 365 placing too much pressure on staff to upskill without giving them the time to do so. Staff needed time to understand rather than play catch up with the students. I have given up much of my own time to upskilling and learning myself.

More time is needed to be able to learn to use other ways of using digital technology to help with learning. Sometimes students know more about technology than we do and fortunately are often willing to help explain it.

While I am supportive and have set my personal goals around improving my understanding and use of digital technology in my programmes it is extremely hard to find regular time when I can practise it and implement it. It is not enough to do it once because it does not embed it in your normal practice.

Alongside developing technical skills, the need for pedagogical change to get the most out of digital technology for teaching and learning was mentioned in 14% of the teachers' comments:

To be an effective tool rather than a pen/paper replacement I am re-planning each unit as I go i.e., back to a beginning teacher. But this takes a huge amount of time in my evenings to source interactions, etc., that will be meaningful.

It is shifting towards a more student oriented approach to learning, rather than the digital tools alone that is transformative.

Digital technology is only a tool. Used with poor pedagogy it damages learning. Used in the right ways it is a phenomenal tool that enhances resource access, blending with home, and for a range of presentation and activity options.

Eighteen percent of the teachers who made comments voiced concern about negative effects on students' learning and wellbeing of digital technology, with comments such as:

Students are less engaged. It's far too easy for them to have apps/games/other tabs open and alt+tab between them. The students also engage with me, as their teacher, less—they are all just faces looking into screens.

Students' literacy + English abilities decline in grammar, punctuation, literacy and self-expression by having a device that corrects their mistakes without their learning processes input. Depth of knowledge declines.

Seventeen percent of the teachers' comments reflected their positive experiences of learning with digital technology:

I teach low literacy students. iPads are the only device that offers students equal access to the curriculum. An iPad can read to them, text to speech, speech to text, scan and read doc to students, collate their work, organise their thoughts, create videos, record music, create music, spell big words they can think and describe but not write. An iPad with the correct tools/apps and education opens doors.

It is a positive and potentially great tool which has made teaching more efficient and stimulating. There is still a need for thinking skills and learning that D.T. cannot yet fulfil.

Issues related specifically to BYOD were highlighted in comments like these:

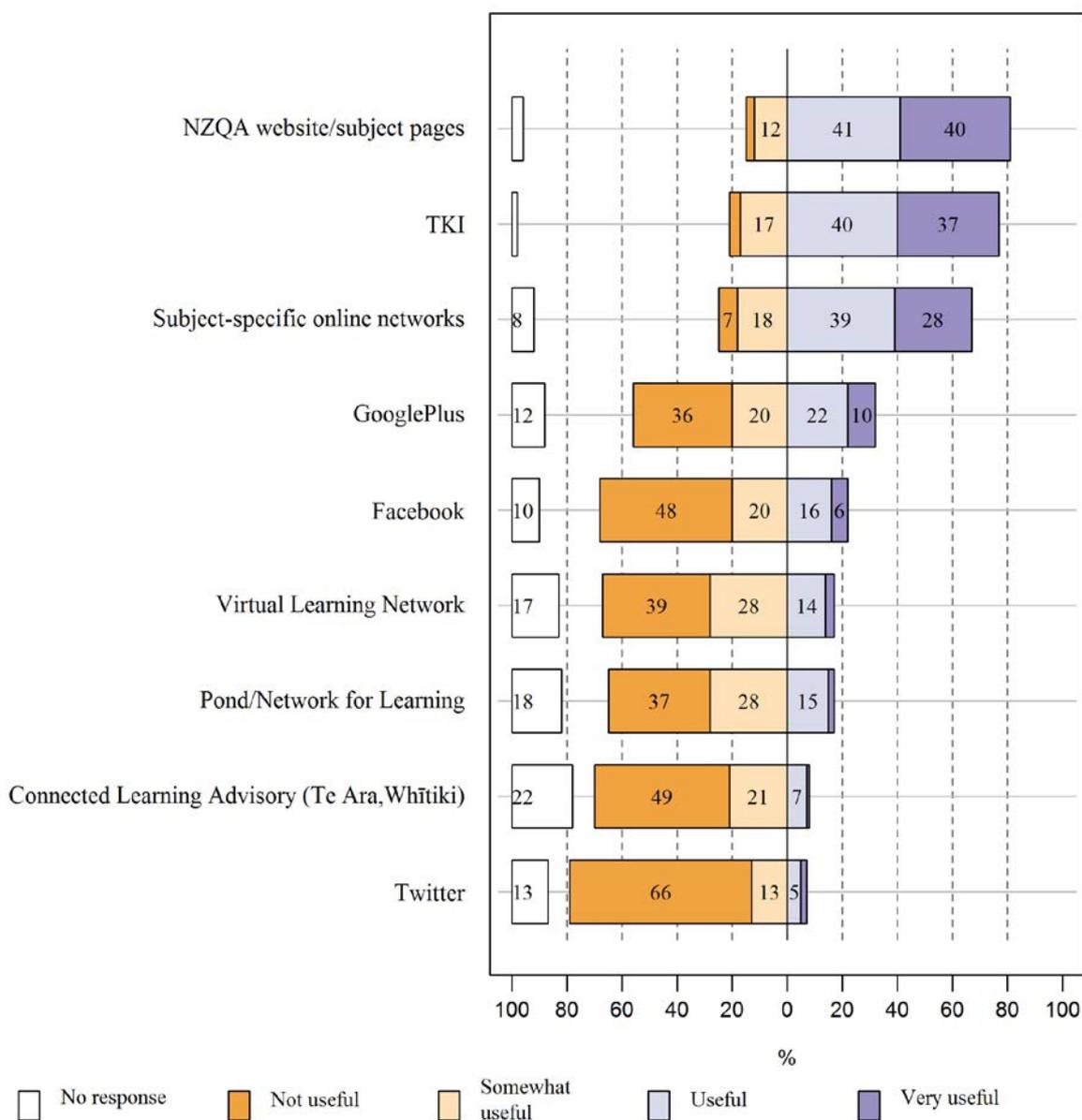
BYOD is great but needs to be communication between intermediate and high school about what devices they are using. iPads ok, but laptops better. Hard for teacher to make sure all they want to do is available on all devices. All iPads or all laptops. Mixture is a nightmare at times.

Not all students are able to BYOD—especially an issue with Pasifika students. Shared devices between siblings, devices confiscated by parents or borrowed by relatives cause disruption to lesson sequences. Many use WIFI at school but have not at home—disrupts homework or collaboration.

How teachers were using online resources and technologies

When teachers responded to the survey in July/August 2015, the online resources they were finding the most useful to support their teaching were NZQA’s website/subject pages, TKI and subject-specific online networks (see Figure 16). Less than one-fifth of the teachers reported finding other government-funded resources (Virtual Learning Network, Pond/Network for Learning and Connected Learning Advisory) useful. In fact, more than one-third of teachers said they are not useful. Whether this is because teachers have looked at them and judged them not useful, or have not yet used them, is unknown.

FIGURE 16 Teachers’ views of the usefulness of online resources for supporting teaching (n = 1,777)

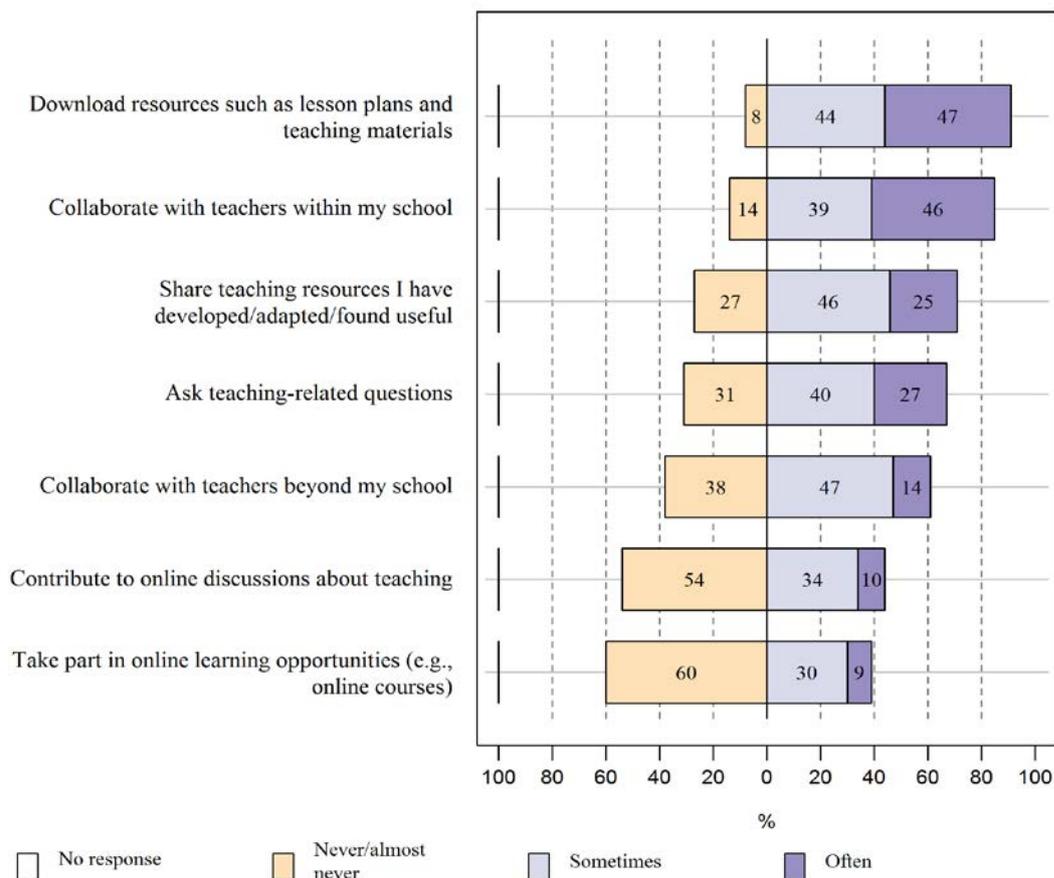


A decile-related difference was evident in teachers' reports that TKI was very useful for supporting teaching (47% of teachers at decile 1–2 schools, decreasing to 33% for decile 7–10). Teachers at low-decile schools were more likely to judge as useful or very useful:

- the Virtual Learning Network (29% for decile 1–2 schools, compared with 14–17% of teachers in schools in other decile bands)
- Pond/Network for Learning (29%, decreasing to 14% of teachers at decile 7–10 schools)
- Facebook (26%, decreasing to 19% of teachers in decile 9–10 schools)
- the Connected Learning Advisory (Te Ara, Whītiki) (14%, decreasing to 6% of teachers in decile 9–10 schools)
- Twitter (12%, decreasing to 5% of teachers in decile 7–8 schools, and 9% in decile 9–10 schools).

So what use were teachers making of online resources? The results summarised in Figure 17 show that they were used often by teachers to download—and to a lesser degree, share—teaching resources, or collaborate with teachers within the same school. Teachers reported less frequent use for activities that involved interacting with others' ideas (apart from those involving colleagues at their school), and online learning. More than half the teachers never or almost never took part in these opportunities or contributed to online discussions about teaching.

FIGURE 17 Teachers' use of online technologies (n = 1,777)



Teachers of Mathematics and Science were the least likely subject group to indicate they collaborated with teachers beyond their school (53%, compared with 66% of teachers of Social Sciences and the Arts—the subject group most likely to do this), or contributed to online discussions about teaching (36%, compared with 53% of teachers of English and Languages).

Teachers also indicated how many people they regularly connected with as part of their professional learning networks (PLN) online. Nearly one-third of teachers did not regularly connect online with anyone as part of their PLN. Just over half reported connecting regularly with up to 20 people and a further 9% with 21 to 50 people. Small percentages of teachers connected regularly with 51 to 100 people, or over 100 people (both figures were 3%). Asking teachers about the number of people with whom they regularly connect online is an indicator that they *do* connect; future surveys might probe the nature of these connections.

In another part of the teacher survey, we asked for their views about their school culture and ways of working (see *Chapter 6: Teachers' perspectives on their work*). There was an association between the frequency with which teachers used online technologies for collaborating with colleagues within their school, and how well they thought ideas were shared in their school. For example, teachers who often used online technologies to collaborate with other teachers in their school were more likely to rate as good or very good the quality of sharing ideas for how to help students improve their performance (76%, decreasing to 52% for teachers who reported never using online technologies to collaborate with their colleagues).

Parent and whānau views of learning with digital technology

When reading this section, it is important to keep in mind that there was an over-representation in the parent and whānau sample of those whose children attended decile 6–10 schools, which the principal and teacher responses show have higher ICT use. We asked what was important for their child's education and 55% of parents and whānau rated opportunities for learning with digital technology to be of high importance. For 8%, digital technology opportunities had helped them choose their child's secondary school.

Seventy percent of parents and whānau reported their child's school had a BYOD policy, and 10% said it did not (a further 19% were unsure). Of this 70%, the majority of parents (79%) had bought a digital device for their child. Fifteen percent of parents with a child at a BYOD school had not bought devices, and indicated the school provided a device for students who didn't have one.

There were some decile-related differences. Thirteen percent of parents and whānau with children at decile 1–2 schools indicated the school has a BYOD policy, increasing to 79% for decile 7–8, and 69% for decile 9–10. Parents with children at decile 1–2 schools were less likely to have bought their child a digital device (13% had), compared with 65% for decile 5–10 schools. Instead, they were more likely to respond that they have not bought a device and their school has devices for students to use if they don't have one (39% of parents and whānau with children at decile 1–2 schools, compared with 15% for decile 9–10). Twenty-three percent of parents and whānau with children at decile 1–2 schools identified the adequacy of digital technology and Internet access as a major issue for the school, compared with 16% of parents with children at decile 9–10 schools.

At the end of their questionnaire, parents and whānau were invited to make a comment about their youngest child's schooling. The very small number (1%) of parents who commented about digital technology made consistently negative comments, such as:

The introduction of BYOD was problematic. Children are under-prepared for timed rests. There are no 'physical' books to study from. I think kids should be given the option of digital or non-digital learning. Buying a device was difficult for us due to cost, we opted for a tablet. Teachers and technology dept not prepared for problems encountered. In private discussions, some teachers anti BYOD. No parent/school consultation/info evenings on BYOD.

Currently only select groups of students have real access to learning with digital technologies. Students using digital tech are only really using it to replace pen and paper. No deeper engagement is happening.

Most contributing primary schools operate with Google Apps for Education, then they go to college and that learning is not supported. Currently they seem to be a lot of bullying, smoking and even drug use.

... we are a lower socio-economic family and cannot afford Internet at home. Therefore my son cannot do homework/revision ... That is dependent on access to the Internet. This is also prevented as we live in the country so he cannot access the Internet on school grounds after school as he has to race to the bus. Thus he has missed out on so much compared to those who have Internet at home. The end result is he will be behind in his studies, unfairly so. This will be an even bigger problem as he advances in years at college.

We feel we have been forced into buying a device for BYOD that doesn't appear to have improved our child's learning in any way.

Trustees' perspectives

Over half the trustees (55%) felt that one of their board's main achievements over the past year was more use of digital technology in learning—an increase from 42% in 2012. Also over the past year, 15% of trustees reported their board had consulted its community about the use of digital technology, and slightly fewer (11%) indicated parents and whānau had raised ICT-related issues with their board. Twelve percent of trustees thought their board needed more experience related to digital technology, and 9% thought their board needed external support and advice in this area.

Summary and discussion

Many of the questions we asked about learning with digital technology were new in 2015, and were intended to provide baseline information against which we can map future change in secondary schools. Looking at the overall picture in 2015, there is evidence that the government provision for strengthening schools' use of digital technology has generally improved the adequacy of schools' digital technology and Internet access since the previous survey in 2012, although issues related to Internet access and reliability of equipment remained for a significant minority of schools. Most schools (62%) had BYOD policies and, as we will see in *Chapter 10: School resources and viability*, more than half of secondary schools relied on parent provision of digital devices.

However, disparities are evident in students' access to digital technology for learning. In a low-decile school, students are likely to be sharing devices which will be available for limited courses. The school-owned devices are more likely to be unreliable and inadequately supported, and these students were less digitally connected. These conditions will prevent students from taking up opportunities to use digital technology for learning at the same rate as those at high-decile schools.

However, we do not want to overlook the challenges facing some high-decile schools. As we will see in *Chapter 10: School resources and viability*, nearly half of decile 9–10 schools were reliant on parents and whānau to be able to provide digital devices for students. This is likely to be resulting in some within-school inequalities. Although more teachers in high-decile schools had good technical support, around a third did not, and a significant majority did not feel enabled by their school to develop the knowledge and skills they need to provide learning with digital technology.

The restricted access in low-decile schools also affects teachers; it will probably mean teachers are unable to make the pedagogical shifts needed to capitalise on the learning opportunities afforded by digital technology. Teachers at these schools are, however, less likely to find that using digital technology pushes their working day further into their own time.

Another issue for teachers was that they felt they needed more professional learning and development to keep their knowledge up to date, with some already feeling left behind. In teachers' comments,

there was a theme of needing time to practise and experiment for themselves before feeling ready to incorporate aspects of digital technology into their daily pedagogy. Finding time to do this within current workloads seemed unrealistic, from teachers' perspectives.

Teachers and principals were generally positive about the gains for students' learning with digital technology. The reported uptake of online opportunities for students to participate in distance learning or e-learning was relatively low.

Working with the data relating to digital technology has highlighted areas to probe in future national surveys. The main area that warrants closer examination is the extent to which the use of digital technology for learning is being accompanied by changes in teachers' pedagogy. From the responses to the teacher questionnaire, we cannot say whether digital technology is being used instrumentally—as a tool to make learning activities that were previously done in other ways, more engaging and time-efficient—or if pedagogical shifts are meaning that digital technology is having a transformative effect on students' learning. Certainly, most teachers are thinking about new ways of teaching and learning, but what is actually changing is less clear.