Engaging apprentices in the construction industry in the online environment

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Executive Summary

COVID 19 accelerated the rapid shifts in Aotearoa New Zealand to technology-enabled learning for education and training. To make effective use of this technology, learners require appropriate digital skills including digital knowledge, competence, and attitude. However, with a recent study suggesting 20% of the adult population (800,000 adults) have digital skills deemed to be below entry level, the ability of many adults able to take advantage of the online environment, and have equitable opportunities is in question.

This report explores the online experiences of Te Pūkenga-BCITO (Building and Construction Industry Training Organisation) work-based apprentices. The move to online learning occurred in 2021 and involved the use of a digital tool using a Learning Management System (LMS) called MyBCITO. Apprentices were encouraged to change to using the online environment to communicate and engage with the training advisor, to participate in online activities such as completing online quizzes, or to read/refer to written resources. Since this major learning and training change, little work has been done to explore the apprentices' experiences of these changes, and gain insights into the impact of factors which may enhance or disadvantage them as learners and trainees in digital engagement.

A review of the key literature highlights that for individuals to participate and succeed in the online learning environment key components must be present or attended to. Each learner must not only have appropriate digital skills, but these must also be underpinned by suitable literacy skills. Skilled readers are able to effectively optimise the use of digital technology while less-skilled readers are disadvantaged. Strong literacy skills support the user in understanding the demands of tasks and help in making suitable decisions about device types or whether working with paper-based resources will be more appropriate. The learning experience is positive when the lack of appropriate literacy or digital skills is identified and addressed at the start of the learning journey.

In addition to digital skills, individuals must be able to connect to and afford appropriate technology and have ongoing training for new tools and initiatives. Supporting these factors is each individual's learner agency; their self-belief and understanding how to learn. Individuals will be disadvantaged if one or more of these is absent in the online experience.

To explore their digital experiences, Te Pūkenga-BCITO apprentices were surveyed online and interviewed in person about ownership and use of devices, access to data, how they used MyBCITO, and their confidence with digital technology. Overall, 952 apprentices responded to the survey and 27 apprentices were interviewed. The interviewees were also asked to complete an LNAAT assessment to measure their literacy skill. While LNAAT provides insights into the general literacy levels of each individual, there is currently no consistent approach to assess their digital skills

as they begin their learning journey, despite a lack of such skills being a potential barrier to effective engagement.

What emerged from the experiences of this group was the interconnected relationship between enablers and barriers. The absence of some factor in digital engagement will be a barrier for one apprentice but when present will act to enable engagement for another. While apprentices in this study were, over-all, enabled by consistent access to the internet and all owned a device, if the device was not fit-for-purpose or relevant to the type of task this acted as a barrier for effective engagement. For some, the potential barrier of a lack of relevant digital and literacy skills was addressed with ongoing support and targeted training. Lack of timely support and training acted as a barrier for others.

For Te Pūkenga-BCITO apprentices who are enabled in the digital environment appropriate literacy, timely support, connectivity, and fit-for-purpose devices act as 'wrap arounds', facilitating ongoing development and growth of digital skills, as well as increasing effective online engagements. Literacy is the foundation for digital skills and scaffolds ongoing uptake of evolving digital technologies.

Individuals must be able to connect to and afford the technology and have ongoing training for new tools and initiatives. Individuals are disadvantaged if one or more of these are absent in the online experience. Overarching the skills, training and accessibility is the need for each apprentice to have learner agency; the apprentice must have self-belief in their ability to learn and understand that this is a lifelong process.

Work must be ongoing with apprentices in the construction industry, and elsewhere, to understand individuals' experiences when training in the online environment and to better appreciate what can be done to support individual success and agency.

Note: It is intended that this report will be primarily of use to Te Pūkenga-BCITO staff and contribute to increasing understanding of the digital capacity and ongoing digital needs of apprentices in the construction industry. However, it is hoped that the information will be of use in informing those in other trade training and beyond, as to how best support and maintain quality experiences for those engaging in technology-enabled education and training.

Recommendations

The eight recommendations of this report are presented below. Some reflect existing processes which will continue to enable online experiences, while others provide a medium-term goal towards enhancing online learning and training experiences.

Support initiatives, informed by diagnostic assessment, and designed to address literacy and digital skills development, and technology know-how, are a priority and must be provided as part of Te Pūkenga-BCITO training.

It is recommended that to enhance the online experience of apprentices:

1. The structured process continues to be used to identify the general literacy, language and numeracy skills of an apprentice.
2. The ongoing support initiatives continue to address individual LLN needs, including the development of learner agency.
3. A structured, standardised process is developed in a timely way, using a collaborative approach within Te Pūkenga-BCITO and implemented to ensure that digital skills are assessed in the early stages of an apprentice's training to inform appropriate digital support requirements.
4. A process to provide appropriate digital skills training is developed and promoted to apprentices throughout their qualification.

Regarding access to the internet, devices and other resources it is recommended that to enhance the online experience of apprentices:

5. A process is developed and implemented to determine where access to the internet and/or fit-for-purpose devices is restricted due to factors including affordability. Where access to either or both is restricted, the process allows for connectivity and the use of a device to be made available for the purpose of training and learning.
6. Consideration is given to continuing to make available, and supply, paper-based resources to apprentices when training information is text-dense, or a hard copy best meets the learning needs of an individual.
7. The function of MyBCITO and resources available on the platform continue to be developed to increase effectiveness of online learning capability.

For Te Pūkenga-BCITO apprentices who do not engage with MyBCITO, it is recommended that to enhance understanding of enablers and barriers for this group:

8. Further investigation is conducted with apprentices who do not engage online to gain more insight into barriers to their online engagement.

Introduction

Background

Digital technology is playing an increasingly important role in our lives, and many of the services we use and rely on are now available with a connection to the internet and the click of a button. In Aotearoa New Zealand a recent study reports that 95% of people go online at least a few times a week with most using online services every day, and 82% of adults have access to both a smartphone and a laptop/desktop computer (BNZ, 2022).

Digital technologies have revolutionised the way we receive and use information (OECD, 2021). There have been rapid shifts to technology-based entry points for, among other things, basic services such as access to government agencies, day-to-day services such as banking, and increasingly for adults, a move to technology-enabled learning for education and training. For example, an established 'seat' of education and learning, the University of Auckland, markets itself as New Zealand's Premier Online University and has developed Auckland Online, with 100% online course delivery and no on-campus requirements or on-campus block courses (Auckland Online, 2023). Auckland University is not unique in introducing online learning systems like this in the traditional classroom-based tertiary sector.

Vocational education too, is said to have entered a new, more sustainable era with the formation of Te Pūkenga-New Zealand Institute of Skills and Technology (Te Pūkenga) aiming to reimage vocational learning to provide integrated on-campus, on-job, and online vocational education and training right across the country (TEC, 2020). On 1 April 2020, as part of the New Zealand Government's vocational education reforms, Te Pūkenga took over responsibility for industry training and apprenticeships from most industry training organisations (ITOs), with the Building and Construction ITO (BCITO) joining what was then named Te Pūkenga Work Based Learning Ltd in October 2021.

All BCITO apprentices are now enrolled in Te Pūkenga-BCITO and as of May 2023 there were 20,375 active apprentices training and learning with the organisation. This makes Te Pūkenga-BCITO the largest educational organisation supporting on-job training in Aotearoa New Zealand's construction industry. The core model of on-job training for these construction workers remains the same with the employer training the apprentice, and a Te Pūkenga-BCITO training advisor conducting assessment via a series of professional conversations over the period of the apprenticeship.

Te Pūkenga-BCITO introduces online methods

Learners in the construction industry are not excluded from the move online. In common with adult training and learning systems worldwide, Te Pūkenga-BCITO has introduced online methods to support learning practices and has developed, and now promotes, the use of online learning supported by a digital toolkit called MyBCITO, a Learning Management System (LMS) built on the Canvas platform. As with many tertiary education organisations, the move towards developing an online platform was significantly hastened by the Covid-19 pandemic which brought an urgent need to quickly adapt the existing service model (Nicki Alori, Digital Learning Product Owner Te Pūkenga-BCITO, personal communication, April 19, 2023). MyBCITO went live in June 2021.

While an apprentice can complete their construction-specific learning without digital engagement, the use of MyBCITO is encouraged. The digital platform continues to evolve, making use of the broad range of tools Canvas offers. While this research focuses on the learner experience of the online platform, the tool is also used by training advisors and employers. From the learner perspective, MyBCITO uses include communication with the training advisor, uploading photos and information about work tasks for comment, completing online quizzes or to read/refer to written resources.

Online engagement vs online learning

There are differences in how my MyBCITO is used. Apprentices can use the tool for functional activities such as uploading information and photos, and communicating with the training advisor. This is **online engagement**, and the required skills are like those used for digital activities such as using social media or watching a YouTube clip for recreation. Apprentices can potentially learn online when they complete quizzes and read/study written resources on MyBCITO. This is **online learning,** which may require a deeper set of cognitive skills. The nature of construction industry on-job learning and the current MyBCITO platform makes it more likely that MyBCITO is mainly used for functional online engagement and less for online learning. However, a proposed next phase of development for MyBCITO would see the inclusion of additional interactive tasks and other resources focused on fostering learning. Understanding that there are differences in the knowledge, skills and mindset necessary for engagement, as opposed to learning is an important part of the exploration of online experiences.

Holistic approach to learning

The use of MyBCITO is strongly promoted partly as a useful tool for all the functions listed but also because a holistic approach to learning views the implicit digital skills as crucial for future professional competence (Susie Jacka, Learning

Practice Manager, Te Pūkenga-BCITO, personal communication, April 19, 2023). This approach is compatible with an equity focus in Aotearoa New Zealand, which has the goal that everyone will gain the skills to participate and benefit from a digital world (Department of Internal Affairs Te Tari Taiwhenua, 2019). The MyBCITO tool was introduced in 2021, and while the organisation routinely surveys users and evaluates feedback to refine and update the tool, more work is required to explore in depth how it is for the apprentices to engage and learn online, and what enables the experience and what may act as barriers.

Digital Skills and Digital Literacy

To make effective use of this online tool, and to benefit from any education and training delivered in the online environment, individuals require appropriate digital skills underpinned by digital literacy. A precise definition of digital skills in 2023 is yet to emerge but it can be thought of as a combination of a digital mindset (hardware, software, information systems, security, and innovation), knowledge (theoretical comprehension and understanding), competence (cognitive and practical know-how) and attitude (value and beliefs) (Digital Skills Organisation, 2020; Gekara, Snell, Molla, Karanasios & Thomas, 2019).

Digital literacy is necessary to develop and build digital skills. It is assumed younger generations are quite familiar and capable with technology and the label 'digital natives' is frequently used. Digital natives are defined as the generations born after 1980 who have grown up in the digital age.

However, familiarity and confidence, and competence are quite different, and it may be the skills needed for online engagement are only some of the skills required for effective online learning. Digital natives are not always equipped with adequate skills or the digital literacy in terms of understanding and using digital information, which is key to learning online (OECD, 2021).

Digital skills in Aotearoa New Zealand

Without the digital skills to adopt digital technology individuals risk being excluded in the online world. BNZ's research into digital capability in Aotearoa New Zealand (BNZ, 2022) demonstrates the ongoing joint efforts of business with Government and the Digital Equity Coalition Aotearoa (DECA) to support digital inclusion. BNZ measured the digital skills of Aotearoa New Zealand adults using groupings of 34 relevant skills to form six categories (BNZ, 2022). The categories are:

- foundational,
- communicating,
- transacting,
- problem solving,
- handling information and content,
- online safety.

The UK Essential Digital Skills Framework was used and modified to inform the framework (GOV.UK) 2019. Examples of relevant foundational skills include: under foundational: turning on a device, using email (communicating); resetting a password (online safety).

To be assessed as having **Essential** digital skills, a person must have all the entry level digital skills in the foundational category and at least one skill from each of the other five categories. Individuals who do not have all the skills listed in the foundational category are identified as **Below essential** digital skills. Twenty percent of the adult population (800,000 adults) have **Below essential** digital skills and 15% of study participants aged under 40 (i.e., those deemed to be digital natives) are in this **Below essential** digital skills category (BNZ, 2022). It is estimated that only 75% of these adults are able to learn online. Without the skills to embrace digital technologies many people risk being left behind (BNZ, 2022).

If an individual is assessed as having all 34 of the relevant skills using the BNZ measures, they are categorised as **Essential plus** digital skills. As part of the research, a closer examination of digital skills in the workplace occurred and revealed that while around 65% of construction staff surveyed said they used digital skills a lot, only around 25% of these construction workers were assessed as having **Essential plus** digital skills (BNZ, 2022).

One consideration as to why individuals have **Below essential** skills and low digital literacy may be that general literacy skills are fundamental to any type of learning and over 1.3 million of Aotearoa New Zealand adults live with low literacy skills (Furness, Hedges, & Piercy-Cameron, 2021). Further, the learning and literacy demands for adults in the 21st century are complex and varied and are ever changing in the digital age (Sabatini, O'Reilly, Dreier, & Wang, 2020). Digital literacy

does not exist in a vacuum and interacts with other capabilities including general literacy and numeracy; sound, robust literacy and numeracy skills underpin digital literacy (OECD, 2021). A necessary characteristic of adult literacy proficiency is the flexibility to adapt one's skills to the ever-changing literacy environment, and in today's digital environment, adult literacy demands are expanding to include abilities to access resources, integrate information across multiple sources, and then be able to utilise, and critique them (Durgunğolu, Gençay, Cantűrk, & Kuşçul, 2020; Sabatini et al., 2020).

Without a sufficient level of literacy, adults will be unlikely to fully meet the challenges in acquiring the technology skills necessary to successfully deal with the modern digital workplace and beyond (Wicht, Reder, & Lechner, 2021). If learners are required to participate and thrive in the online learning environment, more needs to be known about their digital skills and literacy levels when they commence learning so appropriate support can be put in place.

Digital skills framework

Attempts have been made to develop an Aotearoa New Zealand framework to describe and understand digital skills levels. In 2018 the Skills Highway and the Learning Wave developed a draft framework to describe digital skills with a focus on a continuum of practice (Alkema & Murray, 2018). Four levels of digital skills descriptors were proposed at that time to allow judgements about learners' skills: Foundation, Emergent, Competent and Advanced. However, in 2022 Chauvel reported that it was unclear how far work on this model had progressed. Chauvel also argued that in the Work Based Learning (WBL) context in Aotearoa New Zealand there appears to be variable approaches and practices with little external guidance in understanding the digital skills and literacy of adult learners and their online learning experiences (Chauvel, 2022).

Generally, current digital support needs in WBL contexts are identified through training advisor meetings (Chauvel, 2022), with support provided in some cases by external providers with different initiatives being engaged in by some of the WBL groups. A recent review of WBL in Te Pūkenga (Chauvel, 2022) found while there is not currently a tool to assess digital skills of learners there is a desire to collectively develop a diagnostic tool. The development of such a diagnostic tool would potentially provide a standardised, consistent approach to effectively determine digital skills, and support learners to appropriately access technology and engage in learning (Chauvel, 2022).

Very recent research (Alkema, 2023) brings this need for a digital skills framework for Aotearoa New Zealand to the fore and proposes a set of options for consideration. Understanding and meeting the needs of learners with supposed varying levels of digital skills is an acknowledged priority and work and discussion to develop a digital skills framework appears to be progressing.

Well-developed digital skills will enable a learner in the online environment and conversely less developed digital skills can act as a barrier to learning. Alkema (2020) suggests that those learners most in need of support are those who are not familiar with the technology or have lower digital literacy skills. Other enablers and barriers to learning in the online environment are discussed in the following section.

Enablers and Barriers in the online environment

Reading in a digital world

Reading skill can be an enabler for the online learner (Alkema, 2020) but being a less-skilled reader can act as a barrier (OECD, 2021). Readers in the digital age must master reading skills to understand and use new digital practices; reading in digital environments requires many more self- organisational skills with evidence suggesting learners benefit from knowing effective reading strategies (OECD, 2021). Readers without a repertoire of effective reading strategies may be at a disadvantage.

There are growing signs that for skilled readers, when reading in a digital world, there is an increase in the cognitive processing demands expected, including to be able to be navigate across multiple sources and continuously evaluate the quality and validity of these (OECD, 2021; Sabatini et al., 2020). Competent readers can adapt to the purpose of each reading task, and this plays an underlying role in coordinating the different cognitive processes involved in reading online. Skilled adult readers are enabled in the online reading environment. For less skilled adult readers the demands for online reading can act as a barrier to their online experience.

While PISA (Programme for International Student Assessment) data reports on adolescent readers, and caution must be used when relating this to adult readers, the data shows strong adolescent readers can perform well both in print and digital reading. Results from the study highlight the importance of teaching and learning effective reading strategies to bolster reading in digital environments (OECD, 2021).

A hidden barrier to online reading may be that studies have shown that reading text from screens caused more overconfident predictions of performance than reading from paper. Learners have also shown weaker performance and metacognitive awareness of their performance on assessments based on reading from screens compared to paper (OECD, 2021), suggesting that self-identification of ability to operate in the online environment needs to be considered with caution. Learners may not be aware of what they do not know and what they cannot do.

Access to devices and the internet

There is no doubt that digital technologies offer great opportunities, including what, how, where, and when we communicate, recreate, and learn (OECD, 2021). To take advantage of these opportunities individuals must have access to devices and the internet. The Digital Inclusion Blueprint (Department of Internal Affairs Te Tari Taiwhenua, 2019) is an Aotearoa New Zealand initiative focusing on achieving digital inclusion, an outcome where all have equitable opportunities to participate in society using digital technologies (Digital Inclusion Research Group, 2017).

Access is one of the four elements of digital inclusion outlined in the Blueprint. It is defined as "having access to digital devices, services, software, and content that meet our needs at a cost we can afford; and being able to connect to the internet where you work, live and play. Access is a broad element, which can be broken into three key parts: connectivity, affordability, and accessibility" (Department of Internal Affairs Te Tari Taiwhenua, 2019, p.10).

Worldwide, round 4.6 billion people have access to the internet (Avast, 2023) and smartphone usage has gone from a curiosity owned by a few to something used by two billion people. These international trends are reflected in Aotearoa New Zealand (Department of Internal Affairs Te Tari Taiwhenua, 2019). A 2022 Aotearoa New Zealand report shows a steady upward trend in numbers of people having internet connection to their home with over 95% being connected (Kantar Public Research Report, 2022), and 91% of people having home internet access via a mobile device (BNZ, 2022). Eighty-nine percent of Aotearoa New Zealanders have access to a device at all times, with a further 9% having access when they need it (BNZ, 2022).

Despite the increasing availability not everyone has equal digital opportunities. Internationally, the gaps in access to, and use of, the internet for certain groups of people persists (Dulfer et al., 2022; Schwartzbach, 2022). It is estimated that 6% of UK homes (around 1.5 million) don't have any access to the internet (Avast, 2023). Similarly, there are still those in Aotearoa New Zealand who lack the ability to connect to the internet at home due to cost or lack of infrastructure. Others may have internet access, but don't know how to find and use the information and services they're interested in (Department of Internal Affairs Te Tari Taiwhenua, 2019).

In addition, recent research highlights the importance of having the appropriate device for effective digital engagement and not having to rely on a smartphone for every type of digital task (Australian Apprenticeships & Traineeships Information Service (AATis), 2022). People who cannot access and use the internet or may not have the appropriate device for the task, are increasingly at a disadvantage (Department of Internal Affairs Te Tari Taiwhenua, 2019). Equal access is an enabler in the online environment and lack of equal access can be a barrier.

Lack of training in digital technologies

The government supports a vision that all Aotearoa New Zealanders have what they need to participate in, and contribute to, and benefit from the digital world (Department of Internal Affairs Te Tari Taiwhenua, 2019). However, these needs vary and are context dependent, and will continue to be this way, as individuals require different outcomes from being online at any one time. In some situations, the needs will be more than just being able to use digital tools appropriate for everyday online engagements but rather being able to use them with flexibility, and with a range of transferable skills (Dean & Skujins, 2019). Digital skills requirements continue to evolve, and this will involve individuals regularly upgrading their digital skills and know-how and receiving targeted training in how to use new tools and initiatives. Individuals need to build a habit of regular digital training (AlphaBeta, 2022). The skills and knowledge required to use, for example, social media or email are different from the skills and knowledge needed for online research or technical writing.

Competence with different aspects of the functions of online technologies is an enabler while not being able to use the required tools may be a barrier to effective engagement.

Appropriate training in the use of relevant technologies enables online learning. A review in the Australian Vocational Education and Training (VET) sector identified that not ensuring learners are appropriately prepared for, and supported to, undertake learning online, is one potential barrier to learner success (Australian Skills Quality Authority, 2023). In Aotearoa New Zealand, Alkema (2020) found that individuals in the foundation education sector were enabled to learn in the online environment when they are taught how and supported to use specific technologies. However, not only do individuals need to know how to use specific technologies but, to avoid disengagement, the online learning platform and resources need to be easy to navigate and use and the resources well- structured, up-to-date, and engaging (Griffin & Mihelic, 2019).

Learner Agency

Key to successful uptake of, and engagement in, the online environment is a positive mindset to learning. Effective learners are willing to engage in learning generally and accept that constantly learning new skills, systems and content is a lifelong process. This is referred to as learner agency and lack of agency is a barrier to learning including in the digital environment. Learners with agency know how to learn, how to self-manage their learning, and have problem-solving skills. Learners with agency have self-belief that their actions can overcome difficulties (Whitten, 2020). Lower-skilled adults employ fewer behaviours consistent with learner agency than higher-skilled adults (Whitten, 2018). Lower-skilled adults lack learner agency,

and for them, learning skills and problem-solving skills must be consciously and explicitly developed alongside the development of other skills including literacy (Whitten, 2020).

Without agency learners cannot respond to the challenges of the digital age and benefit fully from all that the online environment offers and requires. Even if everyone could develop current digital skills requirements immediately, new technologies will inevitably emerge, bringing with them unforeseen demands (Avast, 2023), with competency levels acquired at any one time becoming outdated and inadequate (Whitten, 2020). Digital skills requirements continue to evolve, and this involves regularly upgrading individual digital skills and knowledge. Individuals need to build a habit of regular digital training (AlphaBeta, 2022). Individuals with learner agency can respond to the challenge of ongoing learning in the digital space, individuals without agency do not have the self- belief in their learning ability to thrive and benefit from the supports offered.

Agency is the essential component in enabling the desired outcome of positive online experiences whether they be functional, everyday tasks or those that facilitate learning. Learner agency is overarching, equipping individuals with the self-belief and attitude to apply and maintain their training and skills, making online engagement and learning possible.

Summary

Various factors act to enable online engagement and learning, or act as barriers when they are not part of an individual's skill set or experience. These factors include digital literacy, underpinned by overall literacy, which is the foundation for digital skills and scaffolds ongoing uptake of evolving digital technologies. Additionally, skilled reading ability ensures individuals optimise online information and learning while less skilled readers may be unable to benefit fully. To be enabled individuals must be able to connect to and afford the technology and have ongoing training for new tools and initiatives. Supporting all this is each individual's learner agency. Individuals are disadvantaged if one or more of these is absent in the online experience.

There is increasing reliance on digital technology and engagement in all aspects of life, and this includes a shift to digital tools to manage and facilitate training and learning. Little work has been done with apprentices in the construction industry to understand their experiences training in this online space and this understanding is key to appreciating the effectiveness of training and learning and what can be done to support apprentice success. This study seeks to explore further the impact of factors which may either enhance or disadvantage construction industry apprentices' online experiences.

Approach

The key research question for this work is:

What are the experiences of apprentices who are encouraged to engage with Te Pūkenga-BCITO in the online environment?

The sub-questions are:

— What are the enablers and barriers for apprentices as they engage in the online environment?

— To what extent do the trainees have effective access to the online learning including i) access to device, ii) access to the internet, iii) support with online learning.

The research used two data collection methods:

a) An online survey of Te Pūkenga-BCITO apprentices

b) Interviews with Te Pūkenga-BCITO apprentices

Survey

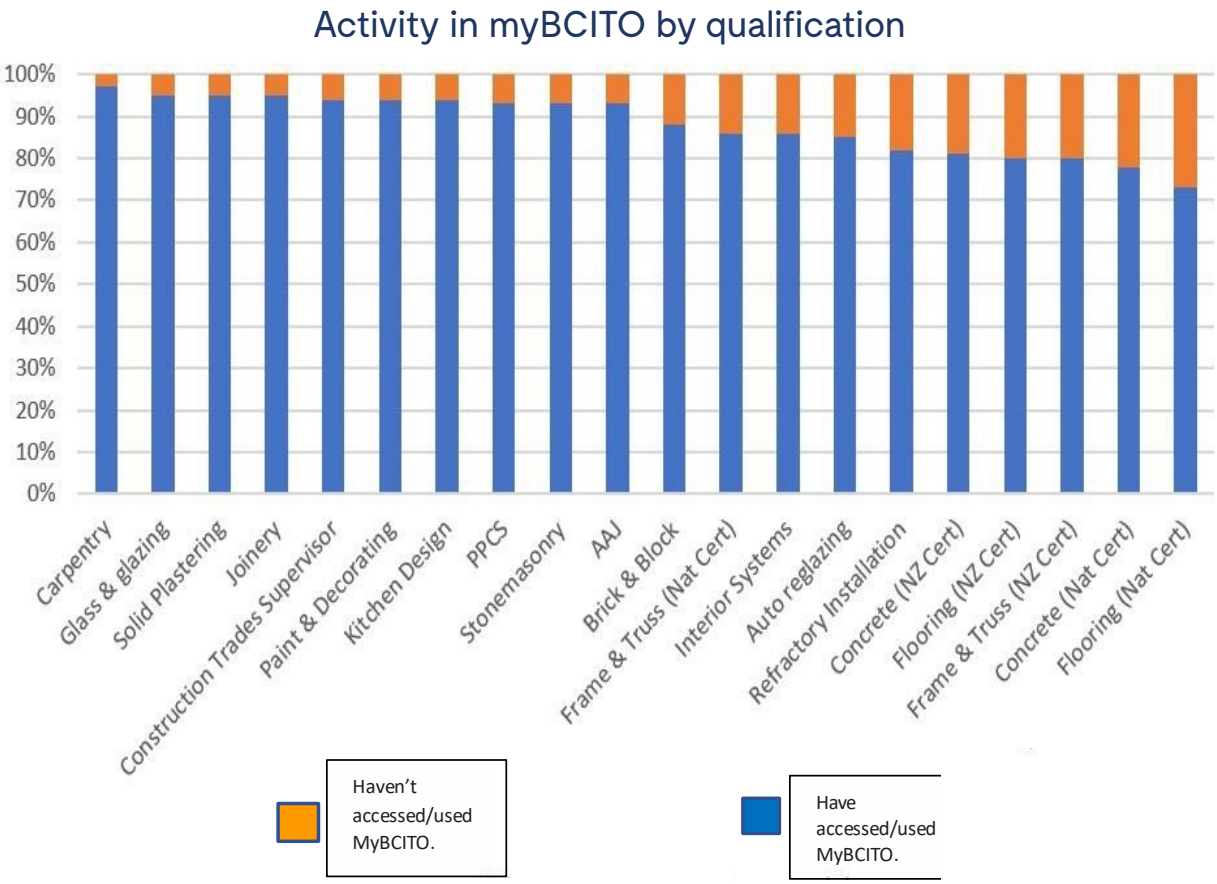
Questions pertinent to the research topic were developed and tested with a variety of interested parties across the organisation. The survey was reviewed by people experienced in developing surveys and minor changes were made. An explanation for the survey, with a link, was sent out via Survey Monkey to all 22,470 apprentices on the BCITO data base. The message was sent on MyBCITO, and the training advisors also shared it through email. The survey was run from November 2022-January 2023.

The purpose of the survey was to provide the opportunity for as many apprentices as possible to have input into information about their experiences in the online environment including on ownership and use of devices, access to data, and barriers in online engagement. Overall, 952 apprentices responded to the survey. This was just over a 4% response rate. The survey questions are attached as Appendix A.

It is acknowledged that an online survey, with almost 87% of respondents reporting they were made aware of the survey via MyBCITO, is only capturing the experiences of apprentices who engage online, and it may be felt the 'voice' of apprentices not using MyBCITO is not heard. However, data on MyBCITO activity provided by the Te Pūkenga-BCITO Digital Group indicates that very high percentages of apprentices in each qualification have engaged with MyBCITO (see Figure 1) (Nicki Alori, Digital Learning Product Owner Te Pūkenga-BCITO, personal communication, April 19, 2023). High numbers of apprentices potentially

had the opportunity to view and complete the survey. This study is about online engagement experiences, and the survey responses provide insights into online experiences of a large group of learners in the construction industry.

Figure 1: Activity in MyBCITO by qualification



Further, a comparison of demographic details of the age ranges, genders, and ethnicities of all Te Pūkenga-BCITO apprentices with the survey participants supports that a broadly representative sample was achieved. Percentages of Māori, Pacific Peoples and Pākehā who responded to the survey are greater than the percentage of each group enrolled as Te Pūkenga-BCITO apprentices (see Figure 2). Age group comparisons show that over 70% of all Te Pūkenga-BCITO apprentices and of those who responded to the data are under 35 years old, or the group considered to be digital natives or those considered to have grown up with digital technology (see Figure 3).

Figure 2: Ethnicity of Te Pūkenga-BCITO apprentices and survey participants

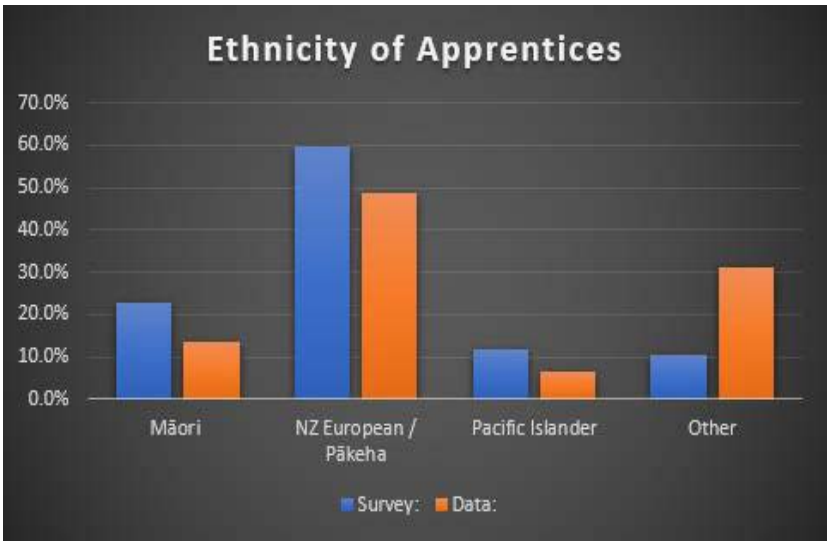
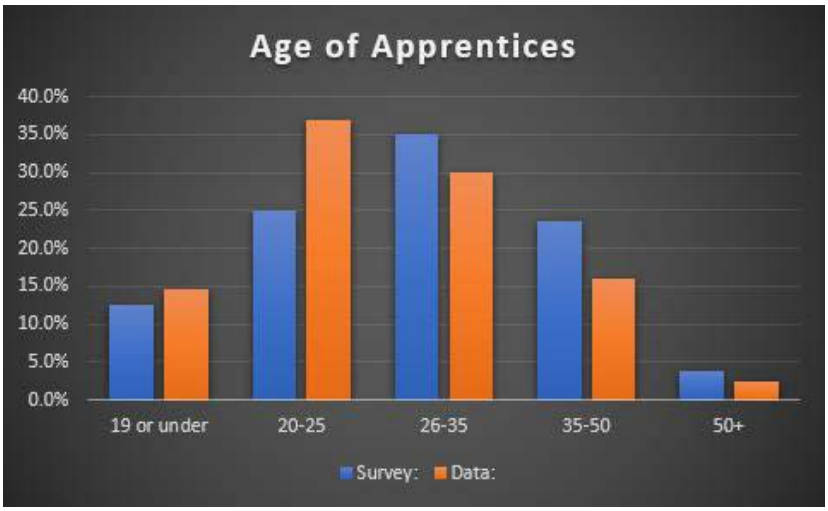


Figure 3: Age range of Te Pūkenga-BCITO apprentices and survey participants



Over 90% of Te Pūkenga-BCITO apprentices identify as male with the rest of the group identifying as female. Just over 86% of survey respondents identified as male, one participant as gender neutral and the rest as female. By far the largest group of respondents (67%) were doing a carpentry qualification and that corresponds with around 70% of all Te Pūkenga-BCITO apprentices who are enrolled in that qualification.

Interviews

The interviews were conducted between February and April 2023. An interview question guide was developed to keep the interviews focused and ensure all aspects of the research questions were covered. Open-ended prompts were included in the question guide. The questions and prompts were reviewed by the nine members of the research team who were to conduct the interviews. Minor alterations were made prior to commencement of interviews. The research team

met via Zoom after a first round of interviews for calibration purposes and the lead researcher reviewed scripts and audio files as each interview was completed to maintain consistency.

Interviewees were asked questions about what devices they owned and preferred to use and why, how confident they felt with digital technology and why they felt like this, and questions about how they accessed and used MyBCITO. The semi-structured prompts allowed for the 'why' questions to probe into the experiences of the online learners.

Responders to the survey were asked to give contact details if they were prepared to be contacted to take part in this interview phase of the study. Although over 800 responders gave their contact details and some were contacted and took part in the interviews, other participants for the interviews were also recruited through the networks the research team have throughout the country within the organisation. This purposive (convenience) sampling approach was used to capture different experiences with online learning (Creswell, 2013; O'Donoghue, 2007) with additional participants selected on the basis they were willing to participate and able to answer the research questions (Punch, 2009).

Of the 27 apprentices who participated in the interviews, 13 identified as female and 14 as male. Five participants identified as Māori or Pacific Peoples, one as Asian and the remaining as Pākehā (three of whom were South African). Twenty-three of the participants were 35 years or under. Fourteen were based in the North Island, while 13 lived and worked in the South Island.

As part of the interview participants were asked to complete the Literacy and Numeracy for Adults Assessment Tool (LNAAT). This is a government funded online adaptive diagnostic tool primarily designed to provide reliable information on the literacy skills of each adult. Each research participant was sent a link and unique code to the task via email and asked to complete the task in their own time. The online LNAAT Snapshot Assessment (Reading, Youth version) was used. A paper-based Reading assessment (low level) was made available to participants who did not want to complete the task online. Participants were advised it may take around 20-30 minutes to complete. LNAAT measures adult literacy, language and numeracy (LLN) skills on a six-step progression with Step 1 being the lowest skill level and Step 6 being the highest. Te Pūkenga-BCITO resources, apprentice tasks and the speaking and listening demands, both on-site and in professional conversations used to assess, have been mapped to the Adult Literacy Progressions (which underpin LNAAT) to determine the skill Step required (Ako Aotearoa, 2022).

Two participants chose to complete the paper-based version of the LNAAT task that was then posted to a member of the research team to be marked. One participant did not complete the task after taking part in the interview. Twenty-four participants completed the online version of the task. The LNAAT task was included

as part of the individual interviews to provide additional insights into existing literacy skills of each participant and LNAAT Step scores were considered as part of the overall analysis of data collected.

All interviewed participants gave informed consent to participate in a 20-30-minute interview (either face-to-face or by phone) and to complete the additional LNAAT task. Participants who completed both received a $50 Prezzy Card. The interview questions, participant information sheet, and consent form are attached as Appendices B & C.

Data analysis

The first set of data, the survey responses, were quantified, and the numbers examined alongside the research questions. The comments made by respondents in the survey were considered as part of this process to build greater understanding of the responses. Along with this examination of the survey, the second set of data, the interview responses, was analysed. Interviews were repeatedly listened to, and notes were read and reread as needed.

Throughout consideration of all data, focus was given to the responses and what they revealed about the online experiences and what may be an enabler or a barrier for each participant. Coding procedures were used to identify common responses and themes that emerged. The research questions were used as a focus throughout each review to enable the researchers to identify viewpoints that were then reduced into themes.

The LNAAT results were considered as part of the exploration of the interview data. The Step level achieved by each participant was noted alongside comments made about experiences reading and engaging online both using MyBCITO and the internet generally.

Findings

Survey

Overall, 952 apprentices responded to the survey, although as it was not mandatory to reply to any one individual question, the number of individual responses to any one question varied. The just over 4% response rate is comparable to the response rate the organisation gets for other large-scale surveys they administer and does provide many apprentice responses to consider.

To attempt to gain increased understanding of the digital experiences of the apprentices, the survey asked questions about ownership and use of devices, type of internet access and usage, self- assessment of technology skills and questions regarding MyBCITO use. Questions had response options which a participant could select including an option to add a comment. For some questions more than one option could be selected.

Ownership and use of device

Almost 98% of respondents (932 of 952) owned and used a smartphone and of the 949 participants who responded to a question about mobile data, 81% said they had a plan that was enough for their needs with around 80% of respondents reporting that they used mobile data all or most of the time at work. A small number

of responses commented on the need to top up data before the end of the month and pay extra for that. Nineteen respondents reported that 'their work' paid for their data or that they were able to use WiFi at work. In terms of access to the internet at home, 947 participants responded with 98% responding positively but 18 apprentices (2%) didn't have access at home.

Technology skills and confidence

When questioned about technology skills and confidence some interesting differences are evident. While 923 apprentices (87%) replied that overall, their skills are good or great, of special interest in this study are the 13% of apprentices who reported not feeling positive about their skills including seven of these apprentices who responded that they feel their skills are 'Terrible, I don't really use technology'. Given that respondents were in an online environment and demonstrated some level of digital literacy to do the survey, it is possible many other Te Pūkenga-BCITO apprentices who did not attempt the survey may not have done so because their digital literacy and confidence was not adequate to enter and complete the survey. Although this is speculative, more investigation is needed to understand the digital skills needs of all apprentices in the increasingly online learning environment.

Overall, 92% feel confident using the internet always or most of the time and although generally levels were high (all over 70%), minor confidence level differences emerged with the use of various devices and Apps. However, 781 respondents answered the question on barriers to using MyBCITO with less than half (354 respondents or 45%) stating they have no barriers and use MyBCITO when they need to.

Barriers to using the online environment

The barriers to learning using the online environment (i.e., using MyBCITO) that respondents gave can be grouped into three categories: lack of appropriate digital skills and knowledge, poor access to a device and/or the internet, and finding time to do it. The first two are of interest in this study which is about experiences while online rather than the realities and experiences of working and learning generally. Respondents could select more than one of the responses, so numbers are considered individually not as a total number (and percentages are rounded). The responses that relate to lack of digital skills are:

- I don't fully understand how to use MyBCITO (145/781 or 18.5%)
- I am not very good with online technology (46/781 or 6%),
- If I had training on how to use it when I started (112/758 or 15%),
- If I was better at reading and maths (63/758 or 8%), and
- If there was someone there to help me understand it (89/758 or 12%).

Responses that relate to barriers around access to a device and/or the internet are:

- MyBCITO is too hard to use on my smartphone (111/781 or 14%),
- My phone is broken or too old to use for MyBCITO (35/781 or 4.5%),
- Others in my whānau need to use the device/technology (12/781 or 1.5%),
- I don't have regular access to the internet (29/781 or 4%),
- I do not have enough internet data (43/781 or 5.5%),
- If I had a better smartphone (112/758 or 15%), and
- If I had better internet access (85/758 or 11%).

The disclosure of these barriers is particularly interesting in that, as previously stated, the survey respondents are a group who have engaged online to do this and demonstrate some level of digital skills and access in doing so. Without further investigation we can only guess as to why there was non-engagement in the survey and surmise that barriers to do with skill and access may be a factor.

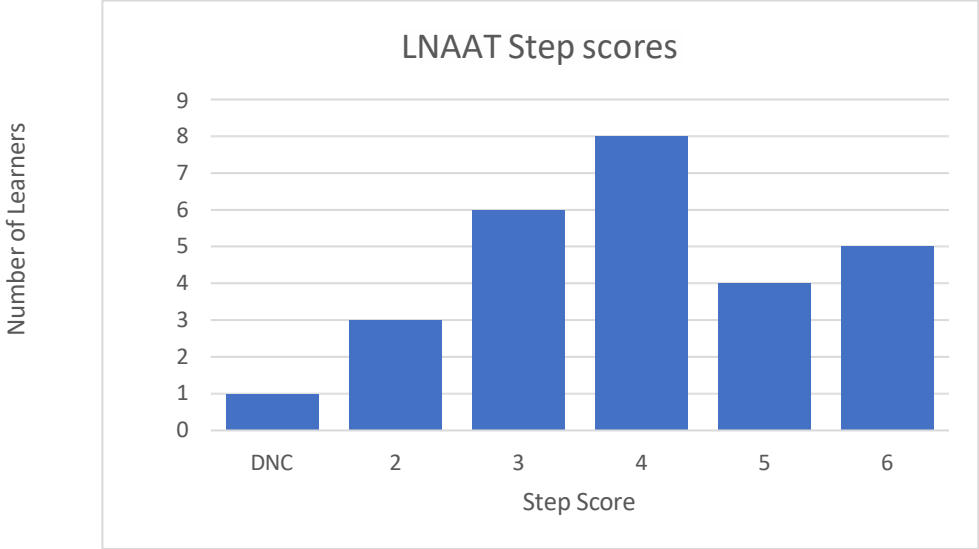
Interviews

Twenty-seven interviewees were asked to complete a LNAAT assessment and asked questions about what devices they owned and preferred to use and why, how confident they felt with digital technology and why they felt like this. Questions were also asked about how participants accessed and used MyBCITO.

The LNAAT results ranged from Step 2 to Step 6 with one participant not completing the task. Nine of the 27 interviewed learners returned LNAAT scores at Step 3 or below. Eight participants are at Step 4, four at Step 5 and five are at Step 6 (see Figure 4). The demands of many LLN tasks in the construction qualifications can be at Step 5-6 (Ako Aotearoa, 2022). LNAAT results at Step 3 and below can indicate that an individual may have challenges with many of the LLN demands of the construction qualifications the apprentices are completing.

Interview responses were considered along with LNAAT results to build understanding of the online experiences. Three themes emerged around factors that enabled or proved a barrier to effective online engagement: a) confidence and skills level, b) device and connection type, and c) who and what is there to help.

Figure 4: LNATT Step scores of Te Pūkenga-BCITO apprentices



Confidence and skills level

When asked directly about confidence level, 22 participants said they were confident or very confident using their device for general everyday tasks such as online shopping, banking, and communicating with others.

> *I use it for everything.*

Generally, reasons for the levels of confidence were to do with success with use and familiarity with the device.

> *You can pretty much find everything you need on google so it is not hard working out how to do things.*
>
> *I am 22 so it is all pretty innate for me.*

For others, confidence came from having or developing skills to manage the literacy demands. Responses such as these demonstrate learner agency and a positive mindset to learn.

> *I have good strategies, processes for doing it.*
>
> *I have dyslexia but I've learnt tricks for it-grown up with it.*
>
> *I have developed strategies-might be slower but I get there.*

Similarly, most participants stated they felt confident or very confident using MyBCITO. One participant did not use the tool and when asked why said, *"probably 'cause I went to use it, couldn't work how to use it".* Some participants, despite initially stating they felt confident engaging with the tool, also stated that they didn't use it often and had difficulties understanding how it worked. Other respondents expressed low confidence levels, or that they were less skilled readers,

when asked how confident they felt with technical skills when going online both generally and with MyBCITO.

> *Ahh not very good…I can do the basic stuff but other than that… -sometimes I struggle with terms and the way sentences are laid out… I can use basic apps and my skills are average…I don't use the internet as well as I could-don't use google much. Sometimes I need help to find what I'm looking for. Reading-I struggle with a lot of the content mainly 'cause I don't understand some terms and words.*

Interestingly, the comments to do with low confidence and reading challenges were made by participants who scored at Step 2 in LNAAT or by the respondent who did not attempt LNAAT. The participant who did not complete LNAAT stated in the interview that they avoided reading so it may be that the non-completion was related to low confidence with literacy.

A pattern emerged of some participants understanding what they know and need to know, that there were things they didn't know, but of having confidence in their ability to learn or manage new tasks if they needed to. Attitudes such as this reflect strong learner agency. Participants who made comments such as this scored at Step 4-6 in LNAAT.

> *Feel confident with my reading-feel I can do all the things I need to…*
>
> (Are there any tech skills you need to develop?) *…for the apprenticeship I am doing I don't think so…*
>
> *There's always stuff I don't know about but that's because I don't really need it so much-I'm sure there's half the stuff on the phone I don't know how to do…I don't need to do it.*
>
> (How do you feel about your skills?) *Pretty good-there are some things that I don't know but when I figure it out I get better.*

Confidence and literacy levels enable or hinder effective digital engagement. Responses of participants who express confidence with digital technology and demonstrate appropriate literacy skill express positive experiences using the online tool. Where participants talk of limited or no engagement with MyBCITO they also discuss lack of confidence and reading challenges.

Device and connection type

All respondents owned a smartphone and only four participants did not own or have access to another device, generally a laptop or desktop. Twenty-five participants said the smartphone was their preferred device, with the remaining two preferring to use a laptop or desktop. The reasons given for this preference were around familiarity with the device, ease of use and convenience.

The phone is good 'cause I always have it with me. Can take phone anywhere-it is small.
If I didn't have my phone, I am pretty sure I'd be lost.

Although the smartphone was overwhelmingly the preferred device, participants discussed using different devices for different tasks. When using MyBCITO, the smartphone was the preferred on-job device for taking photos of tasks to send to the training advisor to help inform the professional assessment conversation. However, a strong view emerged that when annotating the photos or reading the resources on MyBCITO, a device with a larger screen and a keyboard was optimal.

I find the laptop and phone easier for different things.
Use my phone to take /upload photos but then at home use my computer for writing. Combination of both is most effective way for me.
Phone's the most convenient 'cause you literally always have it on you but the laptop is usually the easiest 'cause of keyboard and mouse-lot quicker than what you canwrite/navigate with your thumbs.
The computer is more functional for things like MyBCITO...

Respondents indicated a marked preference for a larger screen when reading and well over half indicated that they use printed resources, supplied to all apprentices, by choice rather than accessing them online on MyBCITO.

Paper copies are good because you can highlight, make notes.
Do you use the books?-*Oh yes-I prefer them*
I find it easier to read my books-don't like to look at a screen all the time.
I can't read a whole book on my phone-that would do my head in. If I didn't have hard copies, I'd print them out.

One participant remarked on a device preference when engaging in online learning.

When using my laptop, I am more in study mode...don't get sidetracked by stuff like someone messaging me –

Generally, access to the internet was not a barrier for these interview respondents either in terms of connectivity or data. Some spoke of being on worksites where there was occasionally no mobile coverage or connectivity and one lived in a very remote part of the country without mobile coverage or internet access at home. All said that this wasn't a major barrier for them, and they just waited until they were somewhere they could connect. Most had WiFi access at home, a few also had access at work. For a small number affordability of data was an issue.

Had to down grade data plan for financial reasons-sometimes runs out now.
Sometimes can't open the app 'cause I have no mobile data.
House has no wifi, data money runs out. Paying for data can be a hassle.

Many participants spoke of having unlimited data plans with the cost being part of the routine monthly spend.

> *Work in affording data to our budget*
> *Just part of my plan.*

Everyone interviewed had a device they could use to connect socially and for work. Having access to fit-for-purpose devices enabled the online engagement in the work context of most participants.

Overall, there was adequate access to the internet, and this was not a barrier for online engagement. Lack of affordability of mobile data put a small number of those interviewed at a disadvantage when trying to engage with MyBCITO.

Who and what is there to help

People and practices facilitate work-related online engagement and conversely where supports are not in place the online experience is discouraging and can have long term negative consequences. Appropriate training in the use of new technologies is enabling. Respondents, despite feeling confident about their digital skills, spoke of frustrations and difficulties encountered in initial engagements with MyBCITO with some confusion evident as to the name of the tool.

> *I had initial problems using MyBCITO.*
> *MyBCITO took some getting used to at first.*
> *Difficult initially, I was not given enough guidance. Initial upload difficulties.*
> *Do you use MyBCITO?* No-I use that Canvas app.
> *I think so-I'd have to check what it is...Yep I do use it- I have canvas on my phone.*

For some the frustrations have persisted.

> *I find it hard to use MyBCITO and not sure if I am doing things right.*
> (What is stopping you using it)-*probably 'cause I went to use it, couldn't work how to use it.*

Others spoke of trouble-free experiences with a scaffolded approach to using the tool.

> *The TA did a workshop right at the beginning before I even logged in. The TA did an induction workshop for MyBCITO which was useful.*

Being able to access appropriate on-going support contributed strongly to a positive online experience as did a suitable environment in which to do things. For a few respondents demands of family life were a barrier to being able to access MyBCITO after work hours, but most of the 17 respondents who uploaded at least once fortnightly said they made the time to do it and home was the preferred space for this.

I go to my mates when I need help with updates or using a new App... I have people who help.
Instant access to my TA through MyBCITO. She's great...TA is amazing...great support. Space to do things helps.
Try and do stuff on MyBCITO at home-more peaceful environment, can think better.

Having timely, appropriate support with online engagement enables the interview respondents in

their use of MyBCITO. Initial frustrations in understanding and managing the functions of the online tool proved to be a long-term barrier for a few, while for others, initial training/workshops in the use of the tool led to positive experiences. Having a suitable environment in which to think and use MyBCITO supports effective use of the tool.

Discussion

This research explored the experiences of apprentices who are encouraged to engage with Te Pūkenga-BCITO in the online environment and attempts to better understand what enables and hinders apprentices as they do this. Of particular interest in this study is:

- access to appropriate devices
- access to the internet or connectivity
- timely support with online engagement.

These sit alongside digital skills underpinned by general literacy and together they make up the four 'wrap arounds' which when present act to enable online engagement. However, if any one of the four is absent or inadequate this can be a barrier to effective engagement. For example, the online engagement may not be useful if there is good internet access, ownership of one or more devices, but the user has insufficient skill to be able to navigate MyBCITO.

Access to devices and the internet

Generally, for the apprentices who took part in this study, access to a device does not appear to be a barrier. Of the 27 apprentices interviewed, all owned a smartphone and of 952 apprentices surveyed almost 98% owned and used a phone. This number is higher than the 89% of adults in the general population reported to have access to a device in the BNZ report (2022), but as all the participants in this research are employed it may be that affordability may be less of an issue than in the general population.

Restricted access to the internet, a broad concern for government (Department of Internal Affairs Te Tari Taiwhenua, 2019), was generally not a barrier. Over 80% of survey respondents said they had a mobile data plan sufficient for their needs and many interview participants spoke of having unlimited data plans with the cost being budgeted for, or part of the routine monthly spend. This supports findings of other Aotearoa New Zealand studies (e.g., Alkema, 2020) where access to the internet and data do not appear to be a barrier. However, even though a relatively small number, participant responses that reflected that affordability of data was an issue, serves as an alert to Te Pūkenga-BCITO that additional support may be needed in some instances if the shift online is to be inclusive. Access to the internet because of cost is a barrier for some.

Fit-for-purpose device

Apprentices in this study had high levels of device ownership and access. Commonly this device is a smartphone but both survey and interview participants clearly expressed preferences about using differing devices for different types of engagement, with a screen larger than that on a smartphone being preferred for writing and reading.

As previously discussed much of what is currently required on MyBCITO is functional engagement e.g., uploading photos, short written texts, as opposed to online learning when text may be lengthy

or difficult to understand or require sustained attention. Overall, more understanding of what promotes effective online learning is required but reading on paper has been found to result in better comprehension than reading the same text on a screen (OECD, 2021), so caution must be exercised if there is to be increased emphasis in the future on the digital platform as the main source of information for apprentices. Research findings elsewhere support that having to rely exclusively on the small screen of a smartphone can be a hindrance to effective online learning (Australian Apprenticeships & Traineeships Information Service (AATis), 2022; Darko-Adjei, 2019; Liu, 2012).

Consideration of device requirements for effective online learning must sit alongside an examination of literacy requirements. Effective reading online, like all reading, requires an individual to be a skilled reader with most competent readers able to effectively optimise the use of digital technology and make decisions about when paper-based, or device-base is better (OECD, 2021).

The device apprentices use when going online must be fit-for-purpose and relevant to the type of engagement required. If the apprentice wants to take photos on-site and upload them for their training advisor to view, then a smartphone may be the best fit. If the apprentice wants to annotate the photos before sending or read up on a particular technical practice, then a tablet or laptop may be best. Strong literacy skills support the apprentice in understanding the demands of the tasks (Sabatini et al., 2020) and making suitable decisions as to device type (OECD, 2021). Some apprentices in this study are not skilled readers and some do not have unhindered access to a device other than a smartphone. In both cases these apprentices are disadvantaged and the online experience for them may not be positive or motivating. Strong literacy skills including digital literacy and access to a fit-for-purpose device are enabling wrap arounds.

Access to support

Contributing to the wrap arounds which facilitate positive online experiences, or hinder when not available, is timely access to support as and when needed. This support may include help with appropriate literacies and general digital technologies, or targeted teaching in the use of specific software (Alkema, 2020). Te Pūkenga has as a fundamental guiding principle that it helps learners learn in a way that suits their life and that learners are the centre of what they do (TEC, 2020). The key to effectively supporting learners is for those working with learners to understand and respond to individual need.

While LNAAT is available and used as a way of assessing general literacy and numeracy need, there is currently no consistent approach to assess the digital literacy and skill of learners as they begin their learning journey in the digital age. Apprentices in this study spoke of initial frustrations learning to use MyBCITO. Others spoke of the usefulness of initial training workshops that enabled a positive experience engaging online. Others commented on the ongoing barrier of lack of understanding of how to use the online tool. Knowing what digital support each apprentice needs and responding appropriately will ensure individuals are not unduly disadvantaged in required online engagement. The development of a diagnostic tool to assess digital literacy and skill has been acknowledged as an urgent requirement to support learners to appropriately access technology and thrive in the online environment (Alkema, 2023; Chauvel, 2022). This report endorses this call.

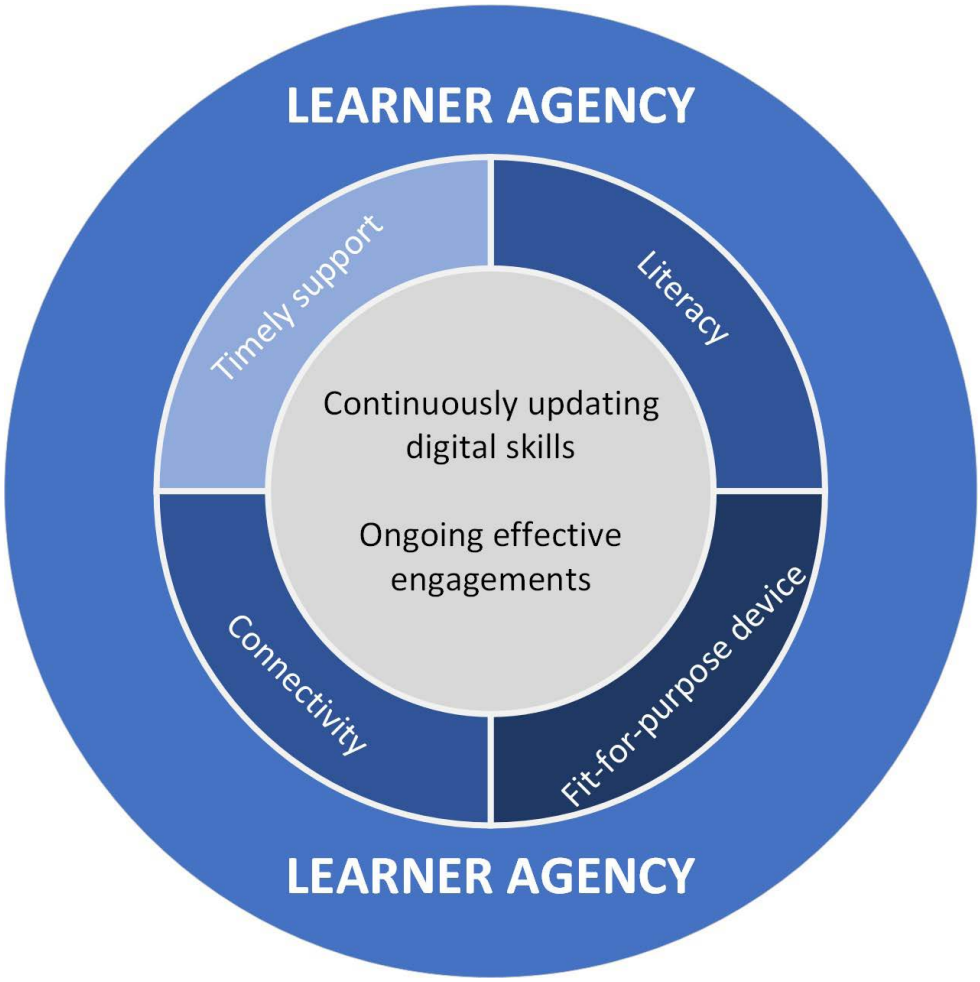
To be enabled, individuals must have initial support if required, as well as ongoing training for new tools and initiatives. Individuals are disadvantaged if this is absent in the online experience.

The essential component: Learner agency

The four wrap arounds, literacy, timely support, connectivity, and fit-for-purpose device, enable ongoing development and growth of digital skills, as well as increasing effective online engagements. However, the process is not sustainable unless learners have learner agency, the understanding of how to learn, how to self-manage their learning, and how to solve problems (Whitten, 2020).

Individuals who are less-skilled often demonstrate low learner agency (Whitten, 2018) and for them, learning skills and problem-solving skills must be explicitly developed (Whitten, 2020).

Figure 5: Enablers for effective online engagement



Lack of agency limits learners' ability to respond to the continuously evolving demands of the digital age. Individuals with learner agency are enabled in the digital space and agency is the essential, overarching component that surrounds and supports the four wrap arounds of access to appropriate devices, access to the internet or connectivity, timely support with online engagement, and literacy. Agency, access to technology, appropriate support, and literacy scaffold continuously updating apprentices' digital skills and ongoing effective online engagements (see Figure 4).

Recommendations

This report has explored the online experiences of Te Pūkenga-BCITO apprentices in online engagement and has specifically sought to understand enablers and barriers for this group of construction workers. Enablers and barriers that emerged from the experiences include timely support with online engagement, access to the internet and access to appropriate devices and learning resources.

Strong learner agency and strong general LLN skills are fundamental to being able to take full advantage of online engagement. The existing practices of assessment of these skills and initiatives to address skill development must continue. A process to inform specific digital skills support does not currently exist and must be developed in the medium-term.

Regarding learning, literacy and digital skills support, it is recommended that to enhance the online experience of apprentices:

1. A structured process continues to be used to identify the general LLN skills of an apprentice.
2. Ongoing support initiatives continue to address individual LLN needs, including the development of learner agency.
3. A structured, standardised process is developed using a collaborative approach within Te Pūkenga-BCITO and implemented to ensure that digital skills are assessed in the early stages of an apprentice's training to inform appropriate digital support requirements.
4. A process to provide appropriate digital skills training is developed and promoted to apprentices throughout their qualification.

Considerations include:

- Appropriate professional development for relevant staff must continue to ensure the needs of each apprentice are identified and addressed.
- Existing models/frameworks or processes in regard to assessing digital skills are finalised and are used to inform what is implemented.
- Development of the process to assess digital skills can be done in collaboration with other Te Pūkenga work-based training groups to expediate the development.

To take advantage of the training and learning opportunities afforded by digital technologies individuals must have access to the internet, fit-for-purpose devices, and printed resources when they are best suited to the task required. Lack of access to any one of these may put a learner at a disadvantage.

Regarding access to the internet, devices and other resources it is recommended that to enhance the online experience of apprentices:

5. A process is developed and implemented to determine where access to the internet and/or fit-for-purpose devices is restricted due to factors including affordability. Where access to either or both is restricted, the process allows for connectivity and the use of a device to be made available for the purpose of training and learning.
6. Consideration is given to continuing to make available, and supply, paper-based resources to apprentices when training information is text-dense, or a hard copy best meets the learning needs of an individual.
7. The functions of MyBCITO and resources available on the platform continue to be developed to increase effectiveness of online learning capability.

This report explores the experiences of apprentices who responded to an online survey or had the confidence to be interviewed and respond to questions about their digital practices. It is acknowledged that this largely captures the 'voice' of apprentices using MyBCITO and further investigation of experiences of those who do not engage in the work-based online environment may provide further insights as to what may be enablers or barriers for engagement.

Regarding Te Pūkenga-BCITO apprentices who do not engage with MyBCITO it is recommended that to enhance understanding of enablers and barriers for this group:

8. Further investigation is conducted with apprentices who do not engage online to gain more insight into barriers to their online engagement.

Concluding comments

Digital technologies have revolutionised the way we access and use information, including how we learn and train to do new things. The skills required to fully engage in technology are now essential life skills. For Te Pūkenga-BCITO apprentices this digital shift has meant a move to an online tool to enhance communication with training advisors and support the training process.

For engagement and learning with this tool, and online technology in general, to be a positive and empowering user experience the online platform and resources need to be continually evolving ensuring they are easy to navigate and use, and the resources are well-structured, up to date, engaging and designed to facilitate learning. Each apprentice must have access to wrap around enablers including adequate digital literacy underpinned by overall literacy, access to appropriate devices, access to the internet and timely support with online engagement. Digital literacy and general literacy together are the foundation for digital skills and scaffold ongoing uptake of evolving digital technologies. Individuals must be able to connect to and afford the technology and have ongoing training for new tools and initiatives. Individual apprentices are disadvantaged if one or more of these are absent in the online experience. Overarching the skills, training and accessibility is the need for each apprentice to have learner agency; the apprentice must have self- belief in their ability to learn and understand that this is a lifelong process.

More work must be done with apprentices in the construction industry and elsewhere to understand individuals' experiences when training in the online environment and better appreciate the effectiveness of training and learning for them and what can be done to support individual success and agency.

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Appendix A

Digital Survey

1. How did you receive this survey?

- [ ] Through myBCITO
- [ ] From my Training Advisor
- [ ] Other (please specify)

2. My age group is:

- ◯ 19 years and under
- ◯ 20-25 years
- ◯ 26-35 years
- ◯ 35-50 years
- ◯ Over 50 years

3. I identify as:

- [ ] Māori
- [ ] NZ European / Pākeha
- [ ] Pacific Islander
- [ ] Other (please specify)

4. I identify as:

- ◯ Male
- ◯ Female
- ◯ Other (please specify)

5 I live and work in:

Auckland

Bay of Plenty

Canterbury

- ◯ Gisborne
- ◯ Hawkes Bay
- ◯ Marlborough
- ◯ Nelson
- ◯ Northland
- ◯ Otago
- ◯ Southland
- ◯ Tasman
- ◯ Waikato
- ◯ Wellington
- ◯ West Coast
- ◯ Other (please specify)

6. I live in a:

- ◯ City
- ◯ Small town
- ◯ Rural area

Comment:

7. The trade I work in is:

8 have been a BCITO apprentice for:

Less than a year

1-2 years

2-3 years

0 3-4 years

0 Over 4 years

9. I own and use (tick all that apply)

- [ ] A smart phone (iPhone or Android)
- [ ] A tablet or iPad
- [ ] A laptop or computer
- [ ] Other (please specify)

10. My mobile internet data access is:

- ◯ I have none
- ◯ A limited plan (that's enough for my needs)
- ◯ A limited plan (that isn't enough for my needs)
- ◯ An unlimited plan

Comment:

11. I have access to free wifi at work

- ◯ Always
- ◯ Usually
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

Comment:

12 I use my mobile internet data at work

All the time

Most of the time

I sometimes run out of mobile data

◯ I often have no mobile data

Comment:

13. When using my mobile internet data at work, I have reliable coverage

◯ Always

◯ Usually

◯ Sometimes

◯ Never

◯ N/A I don't use mobile internet data

Comment:

14. I have access to the internet at home

◯ Yes

◯ No

Comment:

15. I have reliable internet coverage at home

- ◯ Always
- ◯ Usually
- ◯ Sometimes
- ◯ Rarely
- ◯ Never
- ◯ N/A I don't have internet access at home

Comment:

16. In general, I feel that my technology skills are:

- ◯ Great and I can work out everything I need to
- ◯ Ok and I can work out most things
- ◯ Basic and I sometimes need help to work out things
- ◯ Not so good and I often need help to work out things
- ◯ Terrible, I don't really use technology

Comment:

17. I feel confident when using:

	Always	Most of the time	Sometimes	Hardly ever	Never
A Smartphone:	◯	◯	◯	◯	◯
A Tablet:	◯	◯	◯	◯	◯
A Laptop/Computer:	◯	◯	◯	◯	◯
The internet:	◯	◯	◯	◯	◯
Apps:	◯	◯	◯	◯	◯

Comment:

18. I use the myBCITO website / app

- ◯ Daily
- ◯ Weekly
- ◯ Monthly
- ◯ Never
- ◯ I don't know what myBCITO is?

19. I use myBCITO mostly:

- ◯ At home
- ◯ At work (in my break time e.g. during lunch)
- ◯ At work (my employer gives me time to use it)
- ◯ Other (e.g. on the bus home)

20. Are there any barriers to using myBCITO (tick all that apply)

- ☐ I don't fully understand how to use myBCITO
- ☐ myBCITO is too hard to use on my smartphone
- ☐ my phone is broken or too old to use for myBCITO
- ☐ Others in my whānau need to use the device/technology
- ☐ I do not have regular access to the internet
- ☐ I do not have enough internet data
- ☐ Other (please specify)
- ☐ I don't see the relevance for me in my apprenticeship
- ☐ I'm not very good with online technology
- ☐ I can't use my device at work at all
- ☐ I can only use my devise during breaks
- ☐ I am too busy outside of work
- ☐ I have no barriers and use myBCITO when I need to

21. It would be easier to use myBCITO if (tick all that apply)

- ☐ If I had access to a tablet/iPad
- ☐ If I had access to a laptop/computer
- ☐ If I had a better smartphone
- ☐ If I had better internet access
- ☐ If I had training on how to use it when I started
- ☐ Other (please specify)
- ☐ If I was better at reading and maths
- ☐ If I had more time outside of work
- ☐ If there was someone to help me understand it
- ☐ If it was easier to use

22. I mainly access myBCITO using (tick all that apply)

- ☐ Smartphone
- ☐ Tablet/iPad
- ☐ Laptop
- ☐ PC/desk top computer
- ☐ Other (please specify)

23. If you use more than one device which one is easiest for using myBCITO:

- ◯ Smartphone
- ◯ Tablet/iPad
- ◯ Laptop
- ◯ PC/desk top computer
- ◯ N/A (I only use one device)

Comment:

24. If you use myBCITO often and successfully, what has helped you (tick all that apply)

- ☐ I did an online course that helped me
- ☐ My Training Advisor helped me
- ☐ My friends or whanau helped me
- ☐ My employer or workmates helped me
- ☐ It was easy and I worked it out myself

Comment:

25. If you are happy to answer some further questions and go into the draw to win one of five $100.00 Prezzy Card, please type your contact details below and we'll be in touch.

Name:

Email:

Appendix B

1. Introduce yourself, get comfortable and explain what and why- (follow this loose script). We are going to have a chat about your experiences using the internet and your devices as well as MyBCITO and doing other work things online. The information we get from you and others will be used to write a report on how the internet is used by apprentices in the construction industry. Your name and details will never be used just the ideas and thoughts you share with us. This should take about 20-30 mins. Is that OK with you?
2. Ethics. **If face to face** give each participant a paper copy. Go through it with them and explain and get it signed. This document must be kept and returned to the research lead. If the interview is **over the phone or Zoom** read the statement out, ask them if they agree, note that the interviewee has agreed and you sign it and date it. This document must be kept and returned to the research lead.
CHECK IN-Is there anything else you'd like to ask about at this point?

3. Demographics

Contact details (so we can send the Prezzy card when you complete the interview and the online or paper task). This information will not be used for any other reason.

Name _____

Address _____

Phone number _____

Email _____

Age group (tick which applies) 19 years and under

☐ 20-25 years

☐ 26-35

☐ 35-50 years

☐ Over 50 years

I identity as

☐ Māori

☐ NZ European/Pakeha Pacific peoples Other (Specify)

I identity as

☐ Male

☐ Female

☐ Other (Please specify)

I live and work in _____

This is

☐ a city

☐ a small town

☐ a rural area

The **trade I work in is** _____

I have been a **BCITO apprentice f**or _____

4. As I have explained we are interested in your experiences using the internet. What devices do you own and/or commonly use?

_____

_____

_____

5. In this next part we will talk about how confident you feel with using your device(s)

How do you feel about your technical skills when going online *e.g. can you use the internet for everyday things and can you fix basic problems for yourself?*

_____

_____

Tell me a little about why you feel this. *E.g. I do all my banking, shopping and communications online, I use common APPS to look things up/sort out stuff I need to know*

_____

_____

Tell me about whether you find a particular type of device more useful/easier to use? *Unpack any differences with different devices if this comes up*

_____

_____

How do you feel about your reading skills when you are online. *Most of the words are ok to read/understand? I generally understand what I am reading. Tell me about whether you have any difficulties reading and understanding information you see online*

_____

_____

How are your navigating skills? *e.g. can use the internet for everyday things and can mostly find what you need/want. Tell me a little about why you feel this.*

_____

_____

Tell me about any skills you feel you could build/develop which might help you get more from your device *e.g. better search skills, keeping information sorted and filed on your device*

_____

_____

Who mostly assists with difficulties (both technical and understanding what you read) if you have any *e.g. Family and friends, internet company.*

_____

_____

6. Next we'll talk about **ways you use your device**(s):

What do you do online *e.g. social media, internet banking, online calendar, work resources*

Tell me about the apps you use and what you use them for *What's App, Immersive Reader, Facebook, Instagram*

How do you learn about new Apps? How do you learn and keep up with many of the new things on offer?

7. Now we talk about '**going on line**'

How do you generally access the internet e.g. *do you just use mobile data (pre-paid plan, top up when you can...), log in to other peoples' Wi-Fi, have Wi-Fi at home*

What can be some hassles with having to login/go online e.g. *affording data, poor connectivity, getting access to the device when you need it...?*

What sort of mobile data do you use? Do you get to use the WI-FI at work?

Do you ever use community facilities to go online e.g. *Wi-Fi at local library, devices at community centre*

8. I want to ask you about **using MyBCITO**

Do you use MyBCITO -if the answer is Yes-proceed with the questions in section a. If the answer is No-go straight to the bottom of section a) and only ask the questions in section b).

a) Can you tell me a little about what device(s) you mostly use to upload/work on MyBCITO.

_____

Is this/are these your own devices? ____ Tell me more about why you like using this device and what are the features that make it good/easy to use when working on MyBCITO? *What's it like reading the theory work on your phone?*

_____

_____

What are some of the difficult or hard parts of using this device (s) for MyBCITO? *What can be hassles with using MyBCITO?*
Do you prefer using your phone to access learning resources or 'the books' that you're provided... why's that?

_____

_____

How often do you use the device for MyBCITO *e.g. daily, weekly, not much at all*

_____

_____

Where do you mostly do uploads *e.g. home, in the car at smoko...*

_____

_____

What is the most useful feature for you in MyBCITO *e.g. The progress view, Assignment's tab, Quizzes, Ability to upload photos, Work submission*

_____

_____

Can you tell me about any other things that sometimes make using MyBCITO difficult *e.g. Family distractions/obligations, sports/hobbies, lack of motivation...*

_____

_____

Is there anything that would make accessing myBCITO and learning online easier?

_____

_____

b) Only to be asked if the participant does **not** use MyBCITO
Tell me why you do not use MyBCITO. *Why do you feel this way, what is about it that puts you off/stops you using it. What might help you or encourage you to have a go?*

CHECK IN- Is there anything you'd like to add about using devices for your learning and training before we finish off?

Explain about the next step –Next we do the literacy task.

1. We can complete the task here together on my computer.
2. You will be sent an email with a link to the online task you must complete. Click on the link in the email and you will be sent a code to enter so you can begin the task. This task needs to be completed with 7 days.
3. Here is a paper form of the task which you must complete and post back using this envelope. This must be done within 7 days.

Once you have completed the task and submitted it you will be sent the Prezzy card. Thank you for your time.

Appendix C

Ethics document face-to-face

February 2023

Thanks for agreeing to talk with me. I work for BCITO and I am part of a team working to find out more about experiences of BCITO apprentices using the internet for work and learning. This is part of a research project contracted by Ako Aotearoa. It is not a compulsory part of your course and your involvement is voluntary.

I will be asking you some questions about how and when you use your devices and the internet as part of your apprenticeship. I am part of a research team that will use the information you give me together with other information from a larger online survey to write a report. Anything you tell me is confidential and anonymous and you will not be identified in anyway.

If you do decide to participate, you have the right to:
› not answer any particular question
› change your mind about participating at any point before the interview finishes
› ask questions about the research at any time
› be given a summary of the findings of the research when it is finished (approximately June 2023)

The questions should take about 15-25 minutes. I will take notes as we talk and the interview is being taped so it can be listened to again if needed. All this information is stored in password protected computers, and using BCITO procedures. You are also required to complete a literacy task (either online or in paper form) which will also take about 20-25 minutes. Once the task and the interview are completed you will be given a $50 Prezzy card as a thank you for helping with the research.

Please complete the form below.

Consent form

I have read the Information Sheet and have had the details explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree to participate in this study under the conditions set out above.

I understand that my name will not be used in any outputs of the research.

Interviewer name: _____ Date of interview: __ /__ / 2023

Participant name: _____

Participant signature: _____

Ethics document phone or Zoom interview

February 2023

Phone/Zoom use. To be read out. Please complete a separate form for every phone or Zoom interview.

Thanks for agreeing to talk with me. I am going to read you a statement. I want you to listen carefully.

I work for BCITO and I am part of a team working to find out more about experiences of BCITO apprentices using the internet for work and learning. This is part of a research project contracted by Ako Aotearoa. It is not a compulsory part of your course and your involvement is voluntary.

I will be asking you some questions about how and when you use your devices and the internet as part of your apprenticeship. I am part of a research team that will use the information you give me together with other information from a larger online survey to write a report. Anything you tell me is confidential and anonymous and you will not be identified in anyway.

If you do decide to participate, you have the right to:
› not answer any particular question
› change your mind about participating at any point before the interview finishes
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The questions should take about 15-25 minutes. I will take notes as we talk and the interview is being taped so it can be listened to again if needed. All this information is stored in password protected computers, and using BCITO procedures. You are also required to complete a literacy task (either online or in paper form) which will also take about 20-25 minutes. Once the task and the interview are completed you will be given a $50 Prezzy card as a thank you for helping with the research.

Consent form: Please answer yes if you agree with each of the following statements

I have been read the Information Sheet and have had the details explained to me. Yes ☐

My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time. Yes ☐

I agree to participate in this study under the conditions set out above. Yes. ☐

I understand that my name will not be used in any outputs of the research. Yes ☐

Interviewer name: _____

Date of interview: _____ /_____ / 2023

Participant name: _____

Ako Aotearoa

Nā āheitanga ā-mātauranga, ko angitū ā-ākonga
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