Scoping a Digital Skills Framework for Aotearoa New Zealand

Discussion Paper

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1. Introduction

The purpose of this research is to scope a digital skills framework for Aotearoa New Zealand and to present options for taking this forward. This has been done through a desktop literature review conducted in February/March 2023 looking at what is happening in Aotearoa New Zealand and digital skills frameworks that have been developed and used in a sample of overseas jurisdictions. The research answers the following questions:

1. What is the definition of 'digital literacy and skills'?
2. What is the rationale for a digital literacy and skills framework in Aotearoa New Zealand?
3. What international policies and frameworks exist, and what research and/or evaluation is available about these frameworks?
4. What might a digital literacy framework for Aotearoa New Zealand need to include?

The purpose of a framework

At the outset there needs to be clarity about the purpose of a digital skills framework.[1] This work is for education purposes. It is a framework to be used to inform the teaching, learning and assessment of adults' digital skills. It will support a coherent approach to the teaching and learning of digital skills such as that provided by the *Learning Progressions for Adult Literacy and Numeracy* (Tertiary Education Commission, 2008).

[1] The term 'digital skills" is used in this report and the rationale for this is provided in the following section.

2. Key point summary

» Definitions

- No single agreed definition exists, with the terms digital literacy and digital skills being used interchangeably. Generally speaking, digital skills are those needed to safely use digital devices and online tools to communicate, transact, create, and problem-solve.

» Rationale for a digital skills framework

- Full participation in society (life, community, work) requires digital skills.
- Equity and inclusion.
- Figures vary on digital skill levels, but the most recent survey in Aotearoa New Zealand found around 20 percent of the adult population do not have essential digital skills (BNZ, 2022).
- There is increasing demand for digital skills for work.

» Frameworks and content

- Skills are variously called digital elements (NZ); competencies (Australia); skills components (Canada); standards (UK); dimensions (EU); elements (Maryland, USA).
- There is commonality across frameworks in terms of the content, i.e., what is included in digital skills: using devices; creating content; communicating; transacting; problem solving; and staying safe.

» Options for developing a framework for Aotearoa New Zealand

- Align / integrate with the Learning Progressions for Adult Literacy and Numeracy (Tertiary Education Commission, 2008).
- Develop a new, broad essential skills framework that incorporates digital skills.
- Develop a standalone digital skills framework.
- Work with the Digital Inclusion Outcomes Framework that has been developed by the Department of Internal Affairs under the brand digital.govt.nz.

3. Definitions of digital literacy, skills, and inclusion

It is important to start this work with definitions, noting that Alkema (2020, citing Hadziristic, 2017; International Federation of Library Associations (IFLA), 2017; and Gekara, Snell, Molla, Karanasios, & Thomas, 2019) reports on "blurred boundaries" especially in relation to digital skills and digital literacy which are terms often used interchangeably. Perhaps one of the issues for defining 'digital' is that its meaning varies between people and time. "The digital world is evolving exponentially, meaning it cannot be defined to one fixed point" (Digital Equity Coalition Aotearoa, n.d., p. 9). This point is supported by Belshaw (2021, p.26), who talks about it in a different way by referring to the definitional issue as one of ambiguity in that definitions of digital literacies are "*plural, context dependent and need to be co-constructed* to have power" and not be unambiguous.

Wignall, Roberts, and Scomazzon's (2022, p. 31) thinking aligns with this. These researchers note there is "intense interest in digital capability across all education sectors, but the definition of digital literacy and its place in educational frameworks is not yet settled". This conclusion aligns with earlier thinking by the National Centre for Vocational Education Research (NCVER) that there is no agreed definition (Gekara et al., 2019). In their review of a number of frameworks for UNESCO, Law, Woo, de la Torre, and Wong, (2018, p. 6) also note the differing definitions of digital literacy and developed their own definition based on the commonalities they found.

> "Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competences that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy."

Earlier work by Digital Future Scotland (2016) gets around the definitional complexities by saying, "…we cannot have a simple and single definition. As the definition of literacy continues to evolve then our definition of digital literacy also needs to be flexible enough to respond to an ever changing world". However, Digital Future Scotland (2016) goes on to say that it is difficult to teach skills if there is no definition to give direction to what might be taught.

In Canada, Bali (2016) notes the difference between *digital skills and digital literacy,* with the former being about 'what and how' – which tools to use and how to use them, and the latter about choices people make in relation to why, when, who, and for whom. This is similar to The Australian Council for Adult Literacy's (ACAL) (2020, September 28) thinking, whereby digital skills are the "mechanics of using technologies" and digital literacy is about the interaction of literacy and numeracy practices with technology. ACAL (2020) goes on to say that using this definition means digital skills (e.g., turning on a computer, downloading an app) are not enough on their own.

The European Literacy Policy Network (ELINET) (2016) talks about digital literacy being a "broad term with three dimensions which align with the notions of traditional literacy. These are: being able to make meaning from language and pictures (the operational dimension); having a repertoire of practices that support engagement online (the cultural dimension); and being critically literate in the online environment.

The American Library Association (ALA) (n.d.) incorporates skills into their definition of digital literacy, "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills". Schwartzbach (2022) notes these skills are collectively called "digital readiness". Likewise, Education Scotland (n.d.) incorporates skills into their definition of digital literacy which,

> "encompasses the capabilities required for living, learning and working in a digital society. It includes the skills, knowledge, capabilities and attributes around the use of digital technology which enable individuals to develop to their full potential in relation to learning, life and work. It encompasses the skills to use technology to engage in learning through managing information, communicating and collaborating, problem-solving and being creative, and the appropriate and responsible use of technology."

The National Library of New Zealand (n.d.) provides a definition of digital literacy for the compulsory schooling sector. It is "the ability to find, evaluate, use and create digital content in meaningful ways that require critical and creative thinking skills" and requires the following strategies:

- critical thinking — questioning how authentic, valid and useful digital information is
  - communicating and collaborating with others in the digital space
  - using digital tools to design and create compelling original content
  - using digital tools to access, use and share information.

It is probably worth noting that the actions outlined above are relatively broad and operate in a learning environment, whereas the adult sector generally takes a wider perspective and considers the elements of participation — including everyday life, employment, and social inclusion. Belshaw (2021, pp. 42–43) is clear in his work that digital literacies are social practices and talks about the eight elements required to develop digital literacies: cultural, cognitive, constructive, communicative, confident, creative, critical, and civic.

Also in Aotearoa New Zealand, the Digital Inclusion Research Group (2017, p. 2) comments on the broad range of terms that are used to describe digital skills and says the term "'digital capability' refers to the skills required by New Zealanders for living and working in a digital economy". The New Zealand Digital Skills Forum (n.d.,

p. 9) defines digital skills as the "skills needed to find, evaluate, utilise, share and create content using information technologies and the internet".

ChatGPT, perhaps drawing on the sources listed above, says digital skills are the technical ability, and digital literacy is the understanding of how the technology works, how to use it effectively and how to protect oneself and one's data when using the internet. Digital competencies are a combination of technical, interpersonal and problem-solving skills needed to succeed in digital environments (ChatGPT, personal communication, March 7, 2023).

Digital inclusion is not the focus of this work, but the definition is placed here for the connection it has to the work of agencies and organisations in Aotearoa New Zealand and because definitions of 'inclusion' incorporate digital skills, which are necessary for digital inclusion. This connection is made by Reder (2015) whereby digital inclusion encompasses access and use of information, and communication technologies and the training that enables this. It is also made by the New Zealand government's definition of digital inclusion from *The Digital Inclusion Blueprint,* which is "... hav[ing] convenient, reliable access to affordable, accessible digital devices and an internet connection, and [confidence to] use them in everyday life" (Department of internal Affairs, 2019). In this blueprint, digital inclusion has four elements: motivation, access, skills, and trust. The blueprint also takes cognisance of the principles of Te Tiriti of Waitangi and through Te Whata Kōrero is providing the space for tangata whenua to lead on the development of digital inclusion issues for Māori.

In the USA, one of the elements of digital inclusion is access to digital literacy training. Digital skills and digital literacy are seen as necessary for being able to "utilize available technology for individual and social benefit, requires changes across all education systems, from K-12, post-secondary, and lifelong education" (Rhinesmith, Dagg, Bauer, Byrum, & Schill, 2023, p. 8).

3.1 Comment

The brief summary of the literature above highlights the 'defining' challenge. For the most part researchers and agencies differentiate between digital skills and digital literacy. To date in Aotearoa New Zealand this has been avoided through the use of the term digital inclusion. However, for the purposes of this report the term 'digital skills' is used to encompass concepts such as literacy, skills and competencies. These concepts need to be viewed through both acquisition / proficiency and practice lenses, as the two interact and repeat over time (Reder, personal communication, March 27, 2023).

4. Digital skills as an essential skill

Over the last 20 years Aotearoa New Zealand has built a solid infrastructure that supports the teaching and assessment of literacy and numeracy for adults in foundation education (Alkema 2021; Walker 2022). The details of this work and the rationale are set out in Tertiary Education Commission documents.[2] To date, the work in education agencies has been in keeping with the traditional notions of literacy and numeracy, as exemplified in the Adult Learning Progressions (Tertiary Education Commission, 2008), with little attention being given to literacy in the digital mode.

In contrast, in international organisations with an education focus, digital skills are being recognised as important and fundamental as traditional literacy and numeracy. But there is recognition that digital skills are reliant on having literacy and numeracy skills (Bashir & Miyamoto, 2020) and applying these in digital contexts. As the OECD (2019, p. 5) notes,

> "Given this expansion of digitalisation into all areas of life, digital and data literacy are already considered to be core foundations. Being literate in this context requires the ability to read, interpret, make meaning of and communicate through digital texts and sources from a variety of online media. It also requires the ability to evaluate critically and filter information that is so easily produced."

However, and as this report shows, increasing the digital literacy skills of New Zealanders is not just the responsibility of education agencies and organisations. As the BNZ (2022, p. 3) research report notes, both the private and public sectors have a role to play in building these skills.

[2] *LITERACY AND NUMERACY ACTION PLAN 2008-12: Raising the literacy, language and numeracy skills of the workforce.* (Tertiary Education Commission, 2008a, p. 13); *Adult Literacy and Numeracy Strategy 2012* (in Alkema & Rean, 2013); Literacy and Numeracy Implementation Strategy 2015-2019. (Tertiary Education Commission, 2015, p. 16).

5. Rationale for developing digital skills

For some time, we have known that to participate in the world of learning, life, and work and for equity and inclusion, there is an increased need for access to digital technology and the knowledge and skills to use it. These skills can be viewed as an extension of traditional literacy and allow people to take advantage of and participate in a digital world (Belshaw, 2021; Green, 2020). Gekara et al. (2019) say there are three categories of digital skills requirements – basic skills for everyday life; skills for the general workforce; and specialised skills for professionals.

5.1 For life

The European Literacy Policy Network (ELINET, 2016, p. 2) talks about digital skills as essential skills along with language, literacy and numeracy and notes the "centrality and ubiquity of digital devices in contemporary life has led to profound changes in literacy practices at home, school, work and play". This view is supported by the European Commission (2020) who also notes the need for increased capacity and capability in education organisations to deliver digital education.

In the draft Australian National Foundation Skills Framework 2022–2023, the Australian Government (n.d.) reports that while the traditional foundation skills of literacy and numeracy remain important, there is an increasing demand for digital skills. This thinking is supported by the Australian Council for Adult Literacy (ACAL).

Reading health information, filling in forms, participating in remote GP appointments, applying for jobs, working from home, online shopping, critically analysing online news, and other tasks many of us take for granted, now require new strategies for those who are not highly literate. What those strategies are is as yet unclear (ACAL, 2020, August).

While digital skills became a must-have during the pandemic, in reality, this had been the case for some time (Avast, 2023; Bashir & Miyamoto 2020; BNZ, 2022). The pandemic highlighted the need to be able to engage in online environments "for service delivery, information, and making payments" and for education purposes (Guenther, Young, & Smede, 2021, p. 2). Avast (2021) adds 'dating' to this list and the BNZ (2022) found that just over half the people in their study said the internet helped them express their culture, faith or religion. "Young people, Pacific Peoples, Māori, and Asians are even more likely to agree that the internet offers them this benefit" (p. 13).

The pandemic pushed people into using online environments and it is unlikely they will return to their previous ways of operating. For example, in the study by Avast (2021, p. 9), 31 percent of New Zealanders in the study said they will "continue to do more things online after the pandemic as it makes life easier".

5.2 For work

Cedefop's (2020) research found 85 percent of European Union (EU jobs) require basic digital skills and 70 percent moderate levels of information and communications technology (ICT) skills. In their review of the skills required for work in Canada, Palameta, Nguyen, Lee, Que, and Gyarmati (2021) say literacy and numeracy play a key role in around 70 percent of jobs. However, they also note the importance of social and emotional skills combined with digital and literacy and numeracy skills. From a digital skills perspective, the researchers say these skills are important because,

> "Digital technology has changed the way you find and share information, solve problems, and communicate with others. Most jobs now use digital skills, and you need them when you apply other skills such as reading, writing or numeracy. Digital skills help you keep up with changing demands in the modern work place. In daily life you need digital skills to connect safely socially and to make use of online resources and services (Palameta, et al., 2021, p. 22)."

Research from the UK (Centre for Economics and Business Research Ltd (Cebr), 2018) further puts an economic spin on the benefits of basic digital skills, including time savings, earnings, employment, transactions, communications, and ability to use online services.

5.3 For equity, inclusion and wellbeing

The National Adult Literacy Agency (NALA) in Ireland puts an equity lens across literacy, numeracy and digital skills. "These skills enable people to reach their full potential, be active and critical participants in society and help address poverty and social exclusion" (National Adult Literacy Agency (NALA), 2020, p. 8). The research reports on the extent to which digital skills are used in everyday life along with the increasing need for them in the workplace.

The equity argument is also promoted by Schwartzbach (2022) in the United States. He notes that work to date has focused on building the infrastructure, but recently shifts have been made to emphasise inclusion and equity. To achieve this, Schwartzbach (2022) says attention needs to be paid to how to get more people to adopt digital technology through, for example, digital literacy education. This point is also made by Rhinesmith et al. (2023) who include digital literacy training in their definition of digital inclusion.

Aotearoa New Zealand has also taken an equity focus with the *Digital Inclusion Blueprint*. Here the intent is for everyone "to participate in, contribute to, and benefit from the digital world" (Department of Internal Affairs Te Tari Taiwhenua, 2019, p. 5). The importance of social inclusion is highlighted in the BNZ's survey findings (2022, p. 13). They report that being able to interact online "[reduces] someone's loneliness by 20% [and] is estimated to be worth $20,200 (using a

method to monetise wellbeing impacts) … [and as such] they are valuable to health and wellbeing".

The challenge in the Aotearoa New Zealand context is adoption. A recent study conducted through talanoa sessions with Māori and Pacific Peoples (Digital Equity Coalition, n.d.) found 18 percent of the participants did not want to adopt technology because of their concerns around harm. In line with this thinking, the BNZ (2022) study found Pacific Peoples, disabled people, and Māori are more likely to experience digital harm than the total population.

Also, in relation to adoption, other recent research in Aotearoa New Zealand provides information that might contribute to lack of uptake. Firstly, Kantar Public (2023) reports access to and cost of the internet is more of a concern for Pacific Peoples than others. Secondly, Elers, Dutta and Elers (2022) report that digital inclusion is not a priority for Māori and Pacific Peoples who are struggling with poverty, even though there is an increasing requirement by government agencies for online interaction. However, in contradiction to this, the Digital Equity Coalition (n.d.) found widespread use of social media by Māori and Pacific Peoples, so there is a foundation on which to build digital skills development.

5.3 Comment

This literature shows the shift in the discourse from the economic benefits to the role digital skills have in participation in life generally and people's sense of inclusion. Interestingly the BNZ (2022) has been able to monetise this and place a value on health and wellbeing. Whatever the rationale is, there is no denying that digital skills are now essential skills.

6. The digital skills of adults in Aotearoa New Zealand

6.1 Digital skills levels

The most recent data from an international perspective on digital skills come from the 2014 Survey of Adult Skills, part of the OECD's Programme for the International Assessment of Adult Competencies (PIAAC). From a proficiency perspective, 44 percent of New Zealanders are reported as having "strong digital skills" (Satherley, 2021). Having strong skills refers to those on levels 2 and 3 of a three-level framework.[3] However, the converse of this is that the remaining 46 percent do not have strong skills. Thirty-one percent have skills at level 1 on the framework, meaning they can use familiar technology where little navigation or problem solving is required. Other points of note from Satherley (2021, p. 4) include:

- Digital skill levels correspond closely with literacy and numeracy skills
- Younger people, on the whole, had stronger digital skills than people older than their mid- forties
- The more often people use their digital skills at work, the stronger their skills and the higher their average pay rate
- There are wide ethnic disparities in digital inclusion.

In 2021 the BNZ (2022) conducted research using Computer-Assisted Telephone Interviewing (CATI) with just over 1,200 respondents. They used the UK's *Essential Digital Skills Framework* (see Appendix D), which has been modified for the Aotearoa New Zealand context. The list of questions is in Table A1 in Appendix A. The research concluded that 20 percent of the population (800,000 adults) have below essential skills. These people "tend to be from low-income households, have less education, and be disabled" (BNZ, 2022., p. 5). Further findings from this research are provided later in this paper.

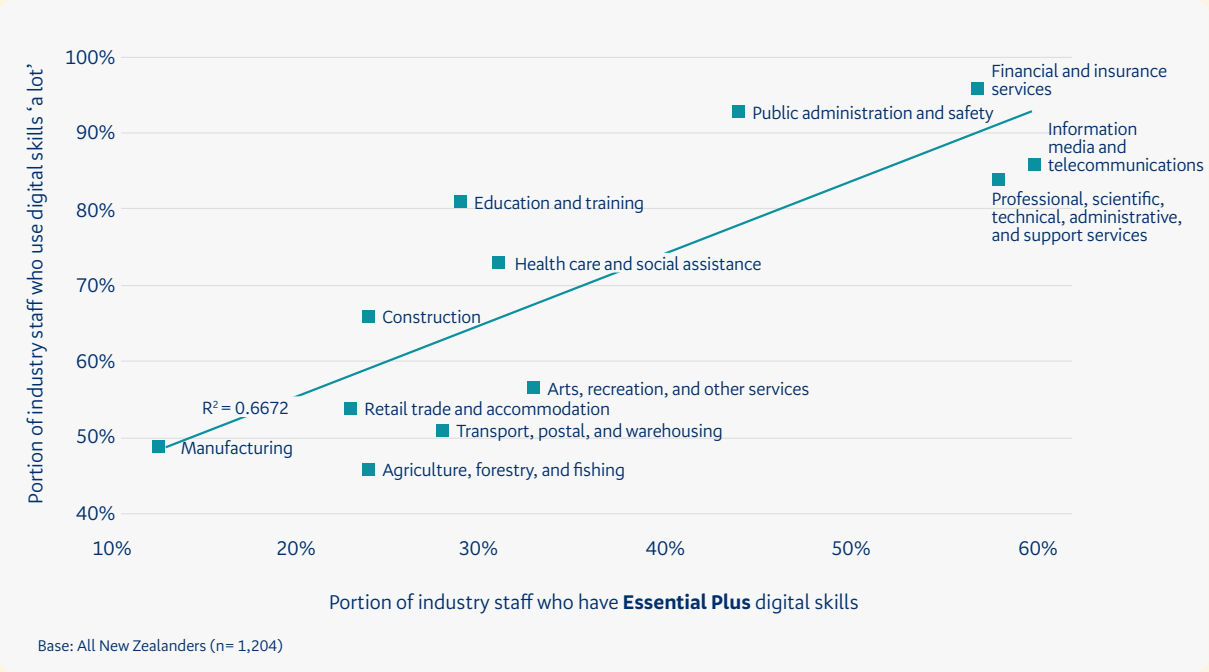
6.2 Digital skills use

In March 2023, Internet New Zealand released its 2022 report (Kantar Public, 2022) showing internet usage is higher than it previously was, with 95 percent of those surveyed using the internet once a day at home. They see it as having benefits for accessing information, communicating with friends and for online shopping.

Digital skill use by industry is reported on in the BNZ (2022) report. The figure is included here as a succinct way to show skills use and associated skills levels.

[3] Levels 2 and 3 involve use of generic and specific technology; navigation; the use of multiple steps to solve problems; and the evaluation of the relevance and reliability of information.

Figure One: Digital skills and use by industry



Source: BNZ, 2022, p. 11.

6.3 Comment

Both the BNZ study and the PIAAC study show that while we have a reasonable percentage of the population with higher digital skills, we also have those who would benefit from further support and training that would help improve their adoption, trust and skills. However, to do this, a framework that describes skills for teaching and learning purposes is required.

7. Examples of existing frameworks

This section looks at a sample of frameworks in Aotearoa New Zealand, Australia, Canada, the United Kingdom, Ireland, the European Commission, and Maryland in the United States. It also considers the wider policy settings in which they reside and reviews / evaluations where these have been conducted. However, in relation to the latter, little has been done given the newness of the frameworks that have been developed.

7.1 What Aotearoa New Zealand has been doing

The mantle for developing digital skills has been picked up by a number of organisations and government agencies in Aotearoa New Zealand. For example, the former group includes Digital Equity Coalition Aotearoa; Digital Inclusion Alliance Aotearoa; Internet New Zealand; IT Professionals New Zealand; NZ Tech; and NZRise. The latter group includes: the Ministry of Business, Innovation and Employment; the Ministry of Education; the Tertiary Education Commission; and the Department of Internal Affairs. Libraries Aotearoa are also working in the digital space.

However, little work has been undertaken in education policy in relation to digital skills. The Tertiary Education Commission (TEC) acknowledges its growing importance, but places this form of literacy as one of the "other literacies (such as financial, digital, health, community, family/whānau and cultural)" (TEC, 2015, p. 18). The TEC's focus remains on the traditional notions of literacy and numeracy, as these are seen as the "foundational base of skills and knowledge" (ibid).

The Industry Training Federation developed a draft framework for trial in workplace literacy programmes (Skills Highway & The Learning Wave, 2018.). This started with three levels of proficiency (emergent, competent, and advanced) across the categories of access (mindset), core knowledge and skills, and contextual digital literacies. The framework was trialled and revised to include a foundation level but got no traction at a policy level. (See Table A2 in Appendix A.) However, The Learning Wave (n.d.) has progressed the work.

Building from the four elements in the New Zealand government's *Digital Inclusion Blueprint,* noted above (motivation, access, skills, and trust), the skills referred to are further described in the *Digital Inclusion Outcomes Framework* (Digital.govt.nz, n.d.). Based on the *Essential Digital Skills Framework in the UK* (see below) the digital skills are: foundational digital skills; communication; handling information and content; transacting; problem-solving; being safe and legal online. Note this is the framework the BNZ used in their research cited above on the digital skills of New Zealanders.

The Office for Seniors has an *Essential Digital Skills/Literacy Evaluation Framework for Seniors,* see Table A3 in Appendix A. This has three dimensions: the ability to connect to the internet using different devices; the ability to carry out online

activities safely and with trust and confidence; and understanding technology and the digital world. The framework has a number of criteria for measuring the extent to which those who have received training have developed their digital skills.

7.2 What Australia has been doing

Australia has a history of work in adult foundation skills and has introduced a new draft framework, *National Foundation Skills Framework 2022 to 2032*, which focuses on foundation skills, including digital literacy. Australia also has a draft *Digital Literacy Skills Framework (*DLSF), developed for the *Foundation Skills for Your Future Program*[4] (Australian Government, 2020) and based on the Australian Core Skills Framework (ACSF). It has three interactive dimensions: three levels of performance; four variables that influence performance (support, context, text complexity and task complexity); and three domains of communication (personal and community, workplace and employment, and education and training) (See Appendix B).

The framework was developed for use as a reporting tool in subsidised training programmes that support the development of both traditional literacy and numeracy skills and digital skills. It has also been used to inform the content and assessment of training programmes and to create a digital literacy licence for people aged 15-25. However, it has not yet been trialled on a large scale or validated (Wignall, Roberts, & Scomazzon, 2022).

While the DLSF was added as a sixth core skill to the ACSF, the review by Wignall et al. (2022) found the structure of the ACSF was not suitable for describing digital literacy. Further, the review found that references to applications and devices should be avoided, as these become outdated and it is more important to focus on what learners are trying to achieve, rather than the technology they are using (p. 31). The review recommends updating the ACSF to embed digital skills into the core skills, rather than as a stand-alone skill. One suggestion made by the reviewers was to align any revisions to PIAAC.

Australia has released version 1 of the *Digital Capability Framework*,[5] which the reviewers recommend, as it describes digital capabilities in a range of work and everyday contexts (Australian Government, 2022). Given it is "accessible to employers, educators, governments and individuals [it] has the potential to become the pre-eminent Australian framework" (Wignall et al., 2022, p. 2).

[4] See https://www.dewr.gov.au/foundation-skills-your-future-program. Approved providers work with employers or individuals (employed or recently unemployed) to develop and deliver training programmes that meet their needs.

[5] This framework is based on the European Union's *DigComp Framework* - See later in this report https://publications.jrc.ec.europa.eu/repository/handle/JRC128415

The *Digital Capability Framework* groups digital competencies into five focus areas:

- Information and data literacy
- Communication and collaboration
- Digital content creation
- Protection and safety
- Technical proficiency and problem solving.

Wignall et al. go on to say,

> "The capabilities are described across four broad levels of proficiency (each with two sub-levels) organised around concepts of complexity and autonomy. Plain English titles for the proficiency levels are Foundation, Intermediate, Advanced and Specialised. The Foundation level is focused on the basic skills required to participate in society and work and captures simple tasks undertaken with some level of guidance; tasks that correspond closely with the proficiency level addressed by the DLSF (2022, p. 28)."

Of note in the Australian context is that, in addition to the ACSF and the DLSF, technical discipline-specific skills are also described in industry qualifications and there are two employability skills frameworks – the *Employability Skills Framework and the Core Skills for Work Developmental Framework.* However, one of the issues found in the Wignall et al. (2022) review was that practitioners thought there was a lack of cohesion between the frameworks and wanted greater clarity and articulation of how the frameworks relate to each other.

NCVER undertook a review of digital frameworks (Gekara et al., 2019, p. 20) and concluded that for the workforce the following digital skills are required:

- digital knowledge (theoretical comprehension and understanding)
- cognitive know-how (involving the use of logical, intuitive, innovative and creative thinking in the digital space)
- practical know-how (including the use of digital tools such as hardware, software, information and security systems)
- competence (ability to learn, adapt and apply digital knowledge in a new setting)
- 'digital' attitude (value and beliefs).

7.3 What Canada has been doing

Like Australia, the Office of Literacy and Essential Skills (OLES) in Canada has updated its existing foundation skills framework, *Essential Skills.* In May 2021 this became *Skills for Success* - nine skills that are needed for employment (Government of Canada, n.d.). This was done because of the "pressing need for a modernised skills framework that is responsive to a changing world and provides consistent language and a common understanding of skills constructs" (Palameta et al., 2021, p. 1).

The definition of 'digital' which is one of the skills in the framework is "[the] ability to use digital technology and tools to find, manage, apply, create and share information and content" (Palameta, et al., 2021, p. 21). In the revised framework, what is encompassed within digital skills has been expanded in recognition of the "rapid technological advancements [and] increasing digital adoption in all realms of work, learning, and life" (Nguyen, Auclair-Ouellet, Kaufmann, Pullman, & Palameta, 2022, p. 6).

Digital is broken down into the following components:

- Use digital devices including computers, tablets, smart phones, and other handheld devices
- Use common digital tools to complete tasks
- Use digital information
- Use online tools and platforms
- Apply safe and responsible practices online
- Update and upgrade digital skills.

See Figure C1 in Appendix C for a breakdown of each of these components, which are further supported by three proficiency levels – entry, intermediate, and advanced. No assessments have been developed for digital skills with the reviewers stating further work is needed in this area.

> "It may be possible to create context-specific assessments and training programs to target these skills, but whether it is feasible to generate a context-free assessment of transferrable Digital skills beyond the basic skills remains an open question, especially given the fast-changing nature of the modern Digital skill needs (Palameta et al., 2021, p. 60)."

Canadian practitioners were, on the whole, satisfied with the *Skills for Success* framework, including that the approach aligned with the learning traditions of indigenous cultures. While they were especially pleased to see the inclusion of the social emotional components, they were also pleased to see digital skills go beyond computer use. They thought this would help learners "keep up with the rapid technological advancements in digital communication" (Palameta et al., 2021, p. 34).

7.4 What the United Kingdom (UK) has been doing

In 2015 the UK developed the *Essential Digital Skills Framework* and updated this in 2018.[6] There are five categories: communicating, handling information and content, transacting, problem-solving, and being safe and legal online. In addition to the five categories, the framework includes foundation skills which underpin the essential

[6] See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/738922/Essential_digital_skills_framework.pdf

digital skills (See Appendix D). The framework has a learner focus with each of the categories having "I" statements (practice indicators) in relation to what learners can do, with life and work examples of activities.

In 2019, *National Standards for Essential Digital Skills* were released (UK Department of Education, 2019a). There are standards for: using devices and handling information; creating and editing; communicating; transacting; and being safe and responsible online. Skills statements, and descriptors of what learners are expected to be able to do, guide what practitioners are expected to teach and what learners are expected to achieve.

The essential digital skills standards are across two levels – entry level and level 1 – and describe the digital skills needed for work and life. These standards are intended to be used by organisations as they develop new essential digital skills qualifications. The two levels are underpinned by foundation digital skills learners are expected to have before enrolling on a course that leads to an essential digital skills qualification[7] which, since 2020, is funded for those 19 and over in England who do not have the digital skills they need for life and work. Courses are classroom-based for around 33-50 hours.

The UK Department of Education (2019b) undertook an impact assessment of the standards. This was consultation about the standards rather than an evaluation, and changes were made to the draft standards based on the impact assessment. Points worth noting from the impact assessment include:

- agreement to the two levels, rather than dividing the sub-entry level into three entry sub-levels for maths and English
- the draft standards use plain English and technical language only when required
- care has been taken to ensure consistency with literacy and numeracy skills.

The Joint Information Systems Committee (Jisc),a not-for-profit digital services and resources company, has developed a digital capabilities framework (Jisc, 2022). While it is intended for use by staff in tertiary education organisations, it can also be used by students. There are six elements contributing to digital proficiency and productivity: digital creations, problem-solving and innovation; digital learning and development; digital identity and wellbeing; information data and media literacies; digital communication, collaboration and participation.

[7] See https://www.gov.uk/guidance/free-qualifications-for-adults-with-low-digital-skills#:~:text=The%20essential%20digital%20skills%20qualification%20offer-In%20April%202020&text=The%20new%20standards%20set%20out,is%20assessed%20against%20these%20standards.

7.5 What Ireland has been doing

The National Adult Literacy Agency (NALA) called for a revised approach to the development of adult skills in Ireland in its report, *Literacy for Life* (Lajoie, Cohen, & O'Neill, 2020). This asks for a refocused policy approach to supporting adults in developing their literacy, numeracy, and digital skills that connect these skills to resilience.

In 2021 the Government of Ireland released *Adult Literacy for Life: A 10-year Adult Literacy, Numeracy and Digital Literacy Strategy.* The approach links to wider cross-government work that spans health, pathways to employment, social inclusion, and wellbeing (Government of Ireland, 2021). Four pillars underpin the approach, one of which is to expand the investment in digital skills provision. This provision is to be linked to the *DigComp 2.2: The Digital Competence Framework for Citizens.* The progress / success of this action will be measured by a decrease in the "share of adults in Ireland without basic digital skills from 47% to 20%". The intent is to measure this using the Digital Economy and Society Index (DESI) which is used to monitor Europe's overall digital performance.[8] There is also an intention to develop a core skills framework.

7.6 What the European Union (EU) has been doing

Digital skills for work and life are at the forefront of the European Union policy agenda. The *Digital Education Action Plan 2021-2027*[9] has two strategic priorities: to foster a high-performing digital education ecosystem and to enhance digital skills and competences for the digital age. The European Union has established a comprehensive set of actions to support these priorities.

Alongside this work, the European Union has updated their original digital competences framework to, *DigComp 2.2: The Digital Competence Framework for Citizens* (Vuorikari, Kluzer, & Punie,2022). An earlier version of this framework, DigComp2.1 is described as "one of the most comprehensive frameworks of digital skills for citizens" (Bashir & Miyamoto, 2020). *DigComp2.2* has five dimensions: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving (see Appendix E). Each of these is broken down into four proficiency levels: foundation; intermediate; advanced; and highly specialised. As with the Essential Digital Skills Framework in the UK, the proficiency levels are broken down into a series of "I can" statements. The framework is supported by reports and guides for implementation.

Law et al., (2018) conducted a review of 47 frameworks for UNESCO. The review did not include frameworks used in Australia, New Zealand, the UK or the USA. The

[8] See https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2022

[9] See https://education.ec.europa.eu/focus-topics/digital-education/action-plan

researchers found five commonalities: “purpose of the framework, competence areas and competences, learning domains (such as knowledge, skills and attitudes), how the tasks are to be performed and the digital tools to be used” (p. 10). This review was undertaken before the development of the frameworks described earlier in this report.

7.7 What Maryland, USA has been doing

The Maryland Department of Labor (2021) has a *Digital Literacy Framework for Adult Learners.* This consists of “seven interconnected elements: Technical, Civic, Communicative, Collaborative, Computational Thinking, Investigative, and Productive” (p. 5). The framework has a description of the elements, situational examples (life, academia, and employment), and guiding questions for learners. For example, the questions in the technical element which is about “physical navigation and operation of digital tools, structures and conventions” ask, “do I know … am I confident … am I able?” (p. 8). See Appendix F for an example. The elements are not levelled.

7.8 Comment

The frameworks have similarities in terms of the content that is expected to be taught and learnt (see Appendix G). However, the approaches vary. For example, Canada and Australia have incorporated digital skills into revised essential skills / core skills frameworks; and the UK, Aotearoa New Zealand, the EU and Maryland, have standalone frameworks. The UK framework is also linked to qualifications.

8. Where to next?

This report shows that the potential development of any digital skills framework would not be starting with a blank slate given the considerable amount of work that has already been undertaken overseas and in Aotearoa New Zealand. Therefore, four options can be considered for progressing work on a digital skills framework.

8.1 Option One: Integrate with the adult learning progressions

At the outset of this scoping exercise, it was envisaged that a digital skills framework would slot in with the Adult Learning Progressions (Tertiary Education Commission, 2008) either as a standalone framework or as an incorporation into a wider, re-envisioned Adult Learning Progressions Framework. However, as this work progressed, it became clear that such an approach would result in:

- assigning the development of digital skills to the foundation education space
- assigning responsibility for the work to educators and education agencies.

Section 7.2 shows when this approach was used in Australia – adding digital skills to the existing ACSF – the format was not suitable and was not appreciated by practitioners.

8.2 Option Two: Develop an essential skills framework

Given the Adult Learning Progressions were developed in 2008 there is a need to re-envision them and consider the development of a wider essential /core skills framework similar to those in Canada and Australia. This would have the advantage of including digital skills within a wider range of skills that are required for life and work. This would be a larger, but timely piece of work, given the recognition from the OECD (2019, p. 5) for the school sector that some "cognitive core foundations need to be updated" for 2030 and given:

- what it means to be literate and numerate now and in the future
- the need for data literacy, good physical, social and emotional wellbeing.

However, the development of such a framework would require a policy reset in relation to essential skills and foundation education generally. In the current tertiary education environment, it is unclear the extent to which there is the appetite for the development of such a framework, or the time and funding, given the major ongoing reform of the vocational education sector.

8.3 Option Three: Develop a standalone digital skills framework

A standalone framework, such as that developed in Maryland, provides a straightforward solution. The content can be informed by the frameworks outlined above and proficiency levels could be developed to support the teaching, learning and assessment of adults' digital skills. The advantage of this option is that, while

it would require funding, it is a contained piece of work that can be progressed. The disadvantage is the stand-aloneness and lack of connection into existing frameworks in Aotearoa New Zealand.

8.4 Option Four: Work with potential partners to further develop the digital inclusion outcomes framework

As noted in Section 7.1, the mantle for developing digital skills has already been picked up by several organisations and government agencies in Aotearoa New Zealand. Interest in assessing the nation's digital skills has also been picked up by the BNZ, who note in their 2022 report (BNZ, 2022, pp. 3-4).

> "Work to increase the digital skills of New Zealanders is broad in scope and we all have a role to play. It requires both the public and private sector to collaborate to build a digitally savvy Aotearoa. … What is clear is that more needs to be done if, as a nation, we are to reap the opportunities of a more productive and sustainable digital economy. … Bridging the digital divide needs to be woven into our education system, our workplaces, and our most affected communities through the support of localised solutions for local problems, designed and led by local people."

Therefore, a framework developed by education agencies alone is not the most suitable approach. Rather, Aotearoa New Zealand would be better served by a collaborative approach and look to undertake further work on the current framework e.g., develop proficiency levels (e.g., entry, intermediate, advanced) for the skill domains in the Digital Inclusion Outcomes Framework. This framework is described as a work in progress that is looking to undertake further work to include the Māori world view of wellbeing into the framework. This would provide a coherent approach for those accessing skills development through education providers, communities and workplaces.

8.5 Recommendation

Given there are benefits and drawbacks to each of the options outlined above, they require further discussion with the sector. This can be done via a webinar convened by Ako Aotearoa.

9. Conclusion

There is no denying that digital skills are now essential skills, just as the traditional forms of literacy and numeracy are. This is signalled in the titles of some of the frameworks, e.g., Skills for Success in Canada; Essential Digital Skills in the UK. These skills are now required for full participation in life, community and work, yet Section 6 above shows that in Aotearoa New Zealand there is still a considerable percentage of the population without the skills to do this. Consequently, there is a need for education and training and there needs to be a coherent framework to guide what is taught and learnt. The options suggested in Section 8 show some possible approaches to be considered. These can be further discussed with government agencies and the sector in order to determine a feasible, practical and manageable way forward to progress a digital skills framework.

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Appendix A: Aotearoa New Zealand

Figure A1: Aotearoa New Zealand – Digital Inclusion Outcomes Framework

- **Foundational digital skills:** People are able to use the internet (for example, they know how to use devices, operating systems and browsers, and connect to WiFi).
- **Communication:** People are able to communicate, collaborate and share using online systems and tools (for example, word processors, email, social media and messaging apps).
- **Handling information and content:** People are able to find, manage and store digital information and content securely (for example, use search engines, create files and folders).
- **Transacting:** People are able to register and apply for services, buy and sell goods and services, and administer and manage transactions online (for example, online banking).
- **Problem-solving:** People are able to find solutions to problems using digital tools and online services (for example, use a search engine to solve a problem, or do an online tutorial).
- **Being safe and legal online:** People are able to stay safe, legal and confident online (for example, they can use different passwords and can authenticate their identity, and they do not use content without permission).

Source: Digital Inclusion Outcomes Framework https://www.digital.govt.nz/dmsdocument/167~digital-inclusion-outcomes-framework/html

Table 1: Digital skills for life

Foundational
Turn on a device
Use the available controls on a device*
Connect to the internet, open a browser like Internet Explorer or Google Chrome*
Interact with the main screen on a device*
Connect a device to a Wi-Fi network*
Update and change your device password or pin code when prompted to do so*
Change the settings on a device to make it easier to use*
Communicating
Communicate with others using email
Attach documents and photos to an email
Communicate with others using messenger apps or chat tools
Communicate with others using video tools, where you can see others on screen
Set up an email account
Create Microsoft Word or Google Docs
Post something on social media
Transacting
Pay for goods or services online
Manage your money and transactions online securely
Access and use public services online, like vehicle registration or MyMSD
Set up an account online to buy goods or services
Upload documents and photographs when needed to complete an online transaction
Problem solving
Use the internet to find information to solve problems
Use web chat, FAQs, and forums to solve problems
Handling information and content
Use Google or other search engines to find information such as shop opening hours
Use the internet to stream or download entertainment
Organise your information and content
Use bookmarks to save and retrieve websites and information
Store information on the Cloud and access that content from different devices
Online safety
Can you reset a password from an online account if you've forgotten it
Can you recognise and avoid suspicious links in emails
Do you use different secure passwords for different websites and accounts*
Can you set and change the privacy settings on your social media and other accounts
Do you update your devices regularly to prevent viruses and other risks*
Do you know where to get help to stay secure online*
If you have the choice, do you use security features, other than passwords*
Do you know what the padlock and 'https' in the address bar mean*

*subset of questions asked for 2022
[7]Govt.uk, 2019. Essential Digital Skills Framework. Available at https://www.gov.uk/government/publications/essential-digital-skills-framework

BNZ Digital skills report 2022

Source: https://tmok.org.nz/wp-content/uploads/2023/04/BNS0692-Digital-Skills-Report-20224.pdf

Table A2: Draft Digital Skills Framework

	ACCESS		CORE SKILLS			Examples of CONTEXUAL COMPETENCIES				
Level	**Willing**	**Able**	**Learn by Experimentation**	**Think Critically and Problem Solve**	**Evaluative Consumption**	**Safety & Security**	**Communication**	**Operating System**	**Workplace Specific (Retail Example)**	**Workplace Specific (Accounting Example)**
Foundation	Is willing to try with guidance if required.	Is learning about the very basics	Starting to get comfortable accessing and exploring digital platforms with guidance	Learning how to handle changing technology and platforms	With support can find and understand information using digital interfaces	With support can follow basic instructions on using passwords	With support is able to communicate using common digital platforms	With support can access the operating system to find programs and documents		
Emergent	Is willing to try with guidance if required. Understands the importance of technology	Can locate and use the very basics: e.g. Power Switch Mouse Interface/UI	Comfortable accessing and exploring digital platforms with guidance and without fear	Able to handle changing technology and platforms when supported. Able to identify and communicate problems	Able to find and understand information using digital interfaces, but has limited understanding of its application	Able to follow basic instructions on using passwords. Aware of internet risks	Able to communicate using common digital platforms	Able to navigate the operating system to find programs and documents	Can operate the Point of Sale system, taking a customer through a transaction	Can use accounting software at a functional level
Competent	Comfortable accessing and exploring digital platforms		Comfortable accessing and exploring digital platforms with no guidance	Able to handle changing technology and platforms without support	Able to understand the value and limitations of online information	Understands the risks and protocols to be safe in the digital world	Able to understand limitations of digital communication, and select appropriate platforms for communication	Working knowledge of multiple operating systems & devices	Can investigate abnormalities with pricing and product information	Can use a range of accounting software, and understands the limitations of each.
Advanced	Understands the importance of DL and embraces change and growth in this area		Actively seeks to practice unfamiliar technology	Embraces new technology, changes, and breakages and can figure out elegant solutions	Able to find and interpret the information required. While understanding the limits of digital information	Has several strategies for maintaining security, passwords, and using encryption	Able to understand how to communicate effectively through different channels, and operate within the nuance of these channels	In depth understanding of multiple operating systems and their potential	Fully understands the uses and limitations of the platforms	Able to make informed recommendations for which system is most effective for different accounting set ups

Source: Skills Highway & the Learning Wave (2018, p. 4)

Table A3: Digital Skills Framework for Seniors

Essential Digital Skills/Literacy Evaluation Framework for Seniors

What do we want to achieve	All older New Zealanders have the digital literacy skills to be digitally included. These include: • being able to connect to the digital world or the internet • having the trust and confidence to carry out online activity and services • staying connected with their families and friends • keeping up with technology as it changes			
What does this look like	Able to connect to the internet with different devices in different ways	Able to carry out online activity and services safely, with trust and confidence, including to: • register and apply for services, buy and sell goods and services, and administer and manage transactions online • interact online safely (understand and avoid scams) with different online devices, systems, and apps • find, manage and store digital information securely • find solutions to problems using online services, including keeping up with change of technology		Have a better understanding about technology and the digital world

How we will measure this
Participants self-evaluate their digital literacy skills before and after training using the enclosed template (*also includes questions about participants' experience on the training programme and trainers/facilitators)*
	Foundation/Basic skills*
	• percentage of participants who can turn on a device and log in to any accounts/profiles they have
	• percentage of participants who can connect a device to a Wi-Fi network
	• percentage of participants who can find and open different applications (App) or programmes on a device
	• percentage of participants who can use the different menu settings on a device to make it easier to use (e.g. change the font size to make it easier to read)
	• percentage of participants who can organise information using files and folders
	• percentage of participants who can use bookmarks to save and retrieve websites and information
	***Participants must have the foundation skills before learning the other skills**
		Skills to carry out online activity and services
		• percentage of participants who can manage their money and transactions online securely, via websites or apps (e.g. bank account)
		• percentage of participants who can buy and/or sell goods or services online
		• percentage of participants who can access and register services online including filling in forms, particularly for government services
		• percentage of participants who can access and manage health services online (e.g. booking appointments or online consultation)
		• percentage of participants who can use the Internet to find information to help them solve problems e.g. use search engines
		• percentage of participants who can use online tutorials, web chat, FAQs and forums to solve problems
		• percentage of participants who can use their digital skills to keep up with change of technology
			Social connection skills
			• percentage of participants who can communicate with others digitally (e.g. email, or Messenger)
			• percentage of participants who can speak to others through video tools (e.g. FaceTime, Zoom or Skype)
			• percentage of participants who can interact and/or post content on social media platforms (e.g. messages, photographs, video etc.)
			• percentage of participants who can use the Internet to stream or download entertainment content (e.g. films, music, games or books)
			• percentage of participants who can set privacy settings on my social media and other accounts
				Skills to be safe online
				• percentage of participants who can keep the information they use to access online accounts secure, by using different and secure passwords for websites and accounts
				• percentage of participants who can respond to requests for authentication (e.g. reactivate an account when they have forgotten their passwords)
				• percentage of participants who can assess the risks and threats involved in carrying out activities online and act accordingly, including
				  ○ percentage of participants who can recognise and avoid suspicious links in emails, websites, social media messages and pop ups, and know that clicking on these links is a risk
				  ○ percentage of participants who can update their computer security systems when necessary to prevent viruses and other risks
				  ○ percentage of participants who can identify secure websites by looking for the padlock and 'https' in the address bar
				• percentage of participants who make sure not to share or use other people's data or intellectual property without their consent
				• percentage of participants who are careful with what they share online as they know that online activity produces a permanent record that can be accessed by others

Input/Intervention	Digital Literacy Training			
Target group/participant criteria	• People aged 65 years and over, from diverse groups including Māori, Pacific, and other ethnic groups • Lack basic understanding about technology, the internet, and online services • Lack knowledge and skills to connect to the internet with different devices in different ways • Lack skills, trust and confidence with technology to carry out online activity and services			

Source: Office for Seniors, https://officeforseniors.govt.nz/assets/documents/our-work/digital-inclusion/Essential-Digital-Skills-Evaluation-Framework-for-Seniors.pdf

Appendix B: Australia

Table B1

DIGITAL LITERACY LEVEL 1

DIGITAL LITERACY LEVEL 1			
1.12	**Demonstrates some awareness of self as a digital user**		
SUPPORT	CONTEXT	TEXT COMPLEXITY	TASK COMPLEXITY
Works alongside an expert/ mentor where prompting and advice can be provided	Highly familiar contexts Concrete and immediate Very restricted range of contexts	Short and simple Highly explicit purpose Limited, highly familiar vocabulary	Concrete tasks of 1 or 2 steps Processes include locating, recognising
FOCUS AREA:	PERFORMANCE FEATURES INCLUDE:		
Connect, communicate and collaborate	– Uses the internet to connect with others using a limited range of digital devices and software – Uses the internet to carry out a limited range of familiar digital activities – Begins to understand and use some basic conventions of online netiquette – Understands a limited range of short, highly explicit digital texts and tasks		
Digital identity and safety	– Begins to recognise own digital footprint and its permanency – Recognises and applies a very restricted range of digital risk protection software and privacy strategies – Begins to recognise unsafe web links and warnings – Makes some distinction between personal and work related use of digital devices and software – Begins to recognise some inappropriate content		

Source: Australian Government (2020, p. 21)

Table B2

DIGITAL LITERACY LEVEL 1			
1.13	**Recognises a restricted range of methods of accessing and organising digital information**		
SUPPORT	CONTEXT	TEXT COMPLEXITY	TASK COMPLEXITY
Works alongside an expert/ mentor where prompting and advice can be provided	Highly familiar contexts Concrete and immediate Very restricted range of contexts	Short and simple Highly explicit purpose Limited, highly familiar vocabulary	Concrete tasks of 1 or 2 steps Processes include locating, recognising
FOCUS AREA:	PERFORMANCE FEATURES INCLUDE:		
Digital technologies and systems	– Identifies some appropriate digital devices and software for immediate tasks – Recognises a limited range of terms, symbols and icons with some understanding of their meaning – Demonstrates some familiarity with the basic layout conventions of websites and screens – Understands the purpose and key features of highly familiar digital devices and software		
Create, organise, present and problem solve	– Uses the key features of a limited range of digital devices and software applications – Retrieves short and simple information from a digital system – Creates new file using highly familiar software – Navigates to required digital location – Begins to use some basic troubleshooting strategies – Uses highly familiar digital peripherals – Uses highly familiar software and adaptive technology to enhance accessibility and useability		

Source: Australian Government (2020, p. 22)

Appendix C: Canada

Figure C1: Digital Components - Skills for success Canada

1. **Use digital devices including computers, tablets, smart phones, and other handheld devices**

- Identify the goals and purposes of the digital task
- Identify and use the basic functions common to most devices
- Know the basic terminology common to most digital devices

2. **Use common digital tools to complete tasks**

- Use software, mobile applications, and other digital tools for a purpose (e.g., Word, Excel, PowerPoint, data analysis software)
- Select appropriate digital tools based on your goals and purposes of tasks
- Keep digital tools up to date (e.g., download updates)
- Use digital tools to enhance accessibility for yourself and others when needed (e.g., screen magnifier and other assistive technologies)

3. **Use digital information**

- Navigate digital content (e.g., know which part of the website to click, know when to click the "Back" and "Next" buttons, know how to scroll through documents)
- Carry out digital searches to find information and content (e.g., know how to use the 'Search' function in a PDF document, know how to use search engines such as Google)
- Evaluate the relevance and reliability of digital information (e.g., recognize which websites are credible from a list of Google search results)
- Store and organize digital information in a logical order (e.g., download online files in a local folder on a computer using files, folders, tags, etc.)

4. **Use online tools and platforms**

- Use online communication and social media platforms (e.g., Zoom, Twitter, emails)
- Use online information-sharing platforms (e.g., Dropbox)
- Use online forms (e.g., for purchases, opening accounts, job applications)

5. **Apply safe and responsible practices online**

- Understand best practices in data storage and sharing (e.g., know how to create a password to protect data)
- Protect personal information and privacy of yourself and others (e.g., know what personal information can and cannot be shared online)
- Protect data and devices from online risks and threats (e.g., use virus protection software, know how to avoid phishing emails)

- Make secure online transactions (e.g., know how to encrypt a data file with a password before making an online transfer, know where and how to enter payment details to safely make online purchases)
- Use appropriate language and behaviour online
- Recognize and minimize the effect of physical and mental stresses of being online

6. **Update and upgrade digital skills**

- Use your existing digital skills and knowledge to learn and apply new and advanced digital skills as needed (e.g., learning basic coding, learning about block chain, virtual reality, specialized electronic equipment at work)

Source: Palameta, Nguyen, Lee, Que, & Gyarmati (2021, pp. 21-22)

Figure C:2 Digital proficiency levels

Entry: You can use basic functions of familiar digital devices. You need guidance to find and evaluate the relevance and reliability of online information, and to engage in safe online practices.

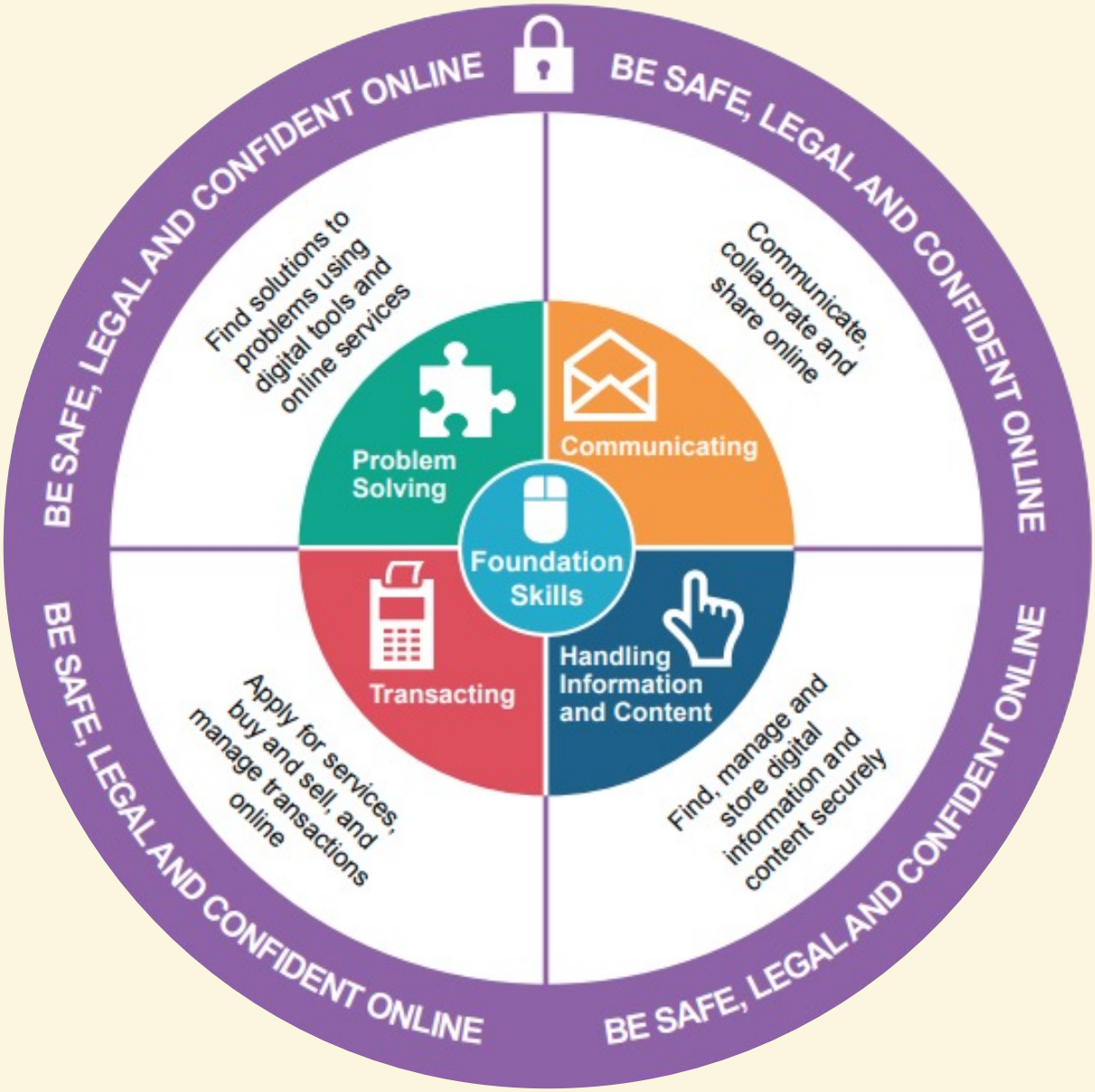
Intermediate: You can use a wider range of functions of familiar and unfamiliar digital devices, including customizing devices for specific purposes (e.g., download and use an app, set up macros to automate tasks). You can find and use relevant and reliable online information and engage in safe online practices.

Advanced: You have in-depth knowledge of digital device operations and information technology systems. You can find and use relevant and reliable online information to improve digital processes, including enhancing your own online safety. You can assess future digital needs and keep your own digital skills up to date.

Source: Palameta, Nguyen, Lee, Que, & Gyarmati (2021, p. 47)

Appendix D: UK

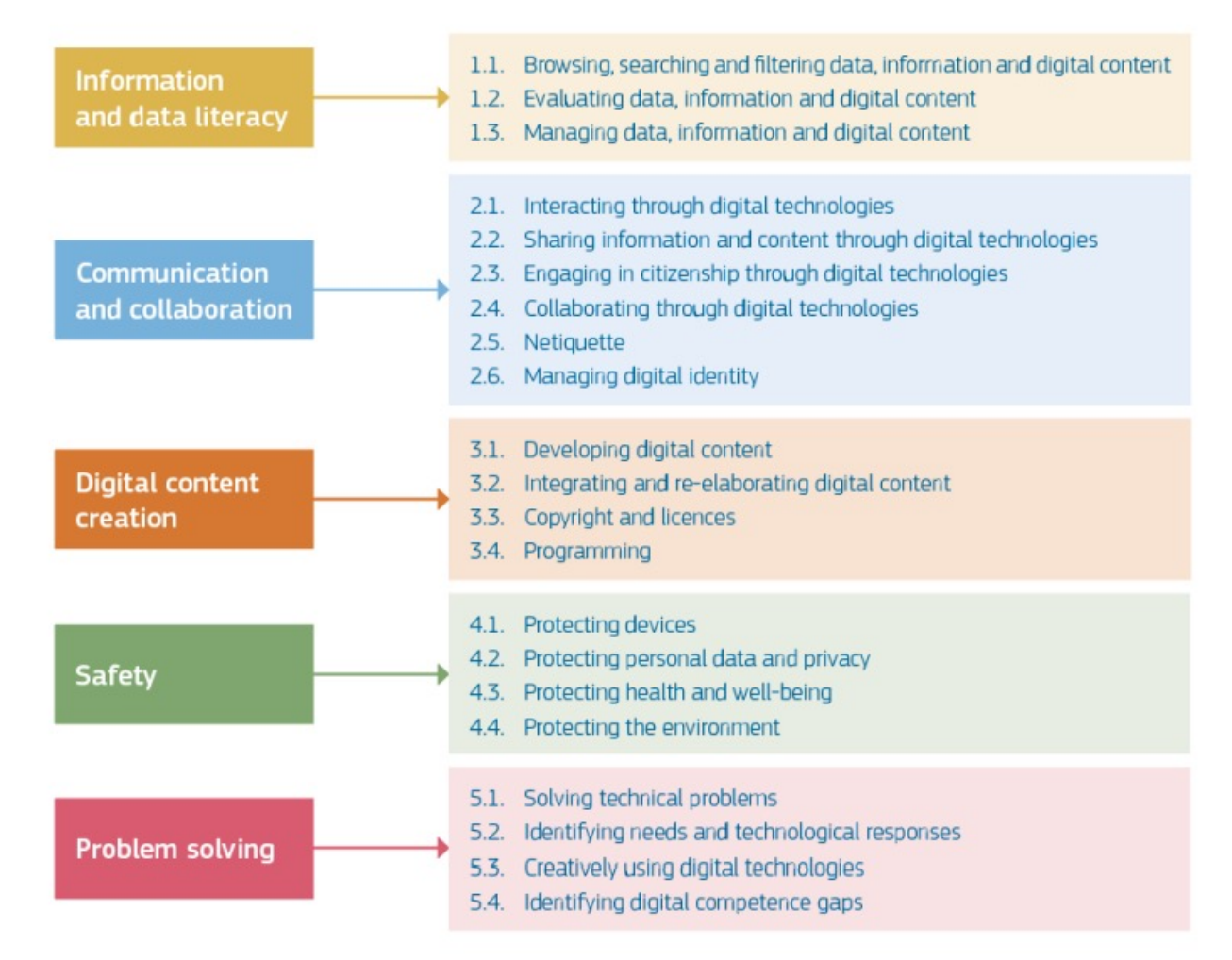
Figure D1: Essential Digital Skills Framework



Source: UK Government (2018)

Appendix E: European Commission

Figure E1: DigComp conceptual reference model



Source: Vuorikari, Kluzer, & Punie (2022, p. 4)

Appendix F: Maryland

Figure F1: Technical element

Source: Maryland Department of Labor(2021, p. 8)

Appendix G: Summary of Frameworks

	Background	Levels / Descriptors	Commentary
Aotearoa New Zealand	*Digital Inclusion Outcomes Framework* Built from the government's vision for digital inclusion in New Zealand. Drew on the Essential Skills Framework in the UK. Acknowledged as a work in progress.	Four elements – motivation, access, skills, trust. Digital skills include: · Foundational digital skills · Communication · Handling information and content · Transacting · Problem-solving · Being safe and legal online. No proficiency levels.	Used as the basis for training programmes supported by the BNZ. Used for a digital skills survey by the BNZ in 2020 and 2021.
Australia	Undertaken 2 approaches: · drafted a Digital Literacy Skills Framework (DLSF) that is stand alone and also added it to the Australian Core Skills Framework (ACSF) in 2020 · has a draft Digital Capability Framework under development	DLSF – in three levels with descriptors and indicators in the domains of: · active awareness of self as a digital user · knowledge, use and application of digital literacy skills. Includes proficiency levels. Digital Capability Framework has digital competencies in: · Information and data literacy · Communication and collaboration · Digital content creation · Protection and safety · Technical proficiency and problem solving. Includes proficiency levels.	Practitioners did not appreciate the inclusion of digital skills into the ACSF as they did not think the framework lent itself to digital literacy. Would rather see a standalone framework. An additional suggestion was to incorporate digital skills into the current core skills in the framework.

	Background	Levels / Descriptors	Commentary
Canada	Digital skills have been Integrated into a revised framework – *Skills for Success* in 2021.	Digital skill components are: · Use digital devices including computers, tablets, smart phones, and other hand held devices · Use common digital tools to complete tasks · Use digital information · Use online tools and platforms · Apply safe and responsible practices online · Update and upgrade digital skills. Includes proficiency levels.	Appreciated by practitioners who would like more guidance / professional development on how to use the framework. In relation to digital they would like more support for indigenous peoples and those in remote communities so they can access hardware and the internet.
UK	National Standards for *Essential Digital Skills* developed in 2015 and updated and released in 2019 The standards serve as the basis for qualifications.	Five categories, underpinned by a foundation skills. The standards are: · Using devices and handling information · Creating and editing · Communicating · Transacting · Being safe and responsible online Includes proficiency levels.	No evaluation, but a potential impact consultation on the standards has been undertaken.

	Background	Levels / Descriptors	Commentary
European Commission	*DigComp2.2* builds on previous work	The framework has five dimensions: · Information and data literacy · Communication and collaboration · Digital content creation · Safety · Problem solving. Includes proficiency levels.	Comprehensive framework that is used to inform other frameworks
Maryland	*Digital Literacy Framework for Adult Learners*	The framework has seven elements: · Technical · Civic · Communicative · Collaborative · Computational Thinking · Investigative · Productive No proficiency levels.	No evaluation / review

Ako AOTEAROA

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