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Mobile libraries and digital inclusion: A study from Aotearoa New Zealand

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Abstract:	Mobile libraries serve communities in a range of ways throughout Aotearoa New Zealand and internationally but their contribution to supporting digital inclusion in non-urban areas has not been explored in depth. This paper presents data from an exploratory research project focused on how mobile libraries in Aotearoa New Zealand extend digital services to those who cannot access public library buildings services conveniently. The findings show that the mobile librarians provide a range of digital inclusion services, predominantly access to technologies and skills development and, by so doing, contribute positively to digital inclusion in non-urban areas of Aotearoa New Zealand.
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Mobile libraries and digital inclusion: A study from Aotearoa New Zealand

Mobile libraries serve communities in a range of ways throughout Aotearoa New Zealand and internationally but their contribution to supporting digital inclusion in non-urban areas has not been explored in depth. This paper *presents data from an exploratory research project focused on* how mobile libraries in Aotearoa New Zealand extend *digital services* to those who cannot access *public library* buildings services *conveniently*. *The findings show* that the mobile librarians provide a range of digital inclusion services, predominantly access to technologies and skills development *and, by so doing*, contribute positively to digital inclusion in non-urban areas of Aotearoa New Zealand.

Introduction

Digital technologies are assuming ever greater importance for people's participation in modern social, professional, and civic life (Jaeger et al., 2012). As the government in Aotearoa New Zealand moves towards government and public services that are digital by default (Department of Internal Affairs (DIA), 2020) and people increasingly "communicate and transact online" (Park et al., 2019, p.139) it is important that everyone has the opportunity to be digitally included. This means that they should be able to access "affordable and accessible digital devices and services at a time and place convenient to them, as well as the motivation, skills and trust to use the internet and pursue and realize meaningful social and economic outcomes" (Digital Inclusion Research Group, 2017, p.5). Those without internet access have been found to have lower subjective well-being than others, are less likely to be civically engaged through activities such as voting or signing a petition (Grimes & White, 2019), and report experiencing isolation, powerlessness, and limited opportunity (Elliot, 2018) as a

consequence of their digital exclusion. People living in non-urban areas are recognized as one group at risk of not being digitally included (Gann, 2019; Kos-Łabędowicz, 2017; Park, 2017).

In Aotearoa New Zealand, people with limited internet access often cite their local library as a place they can access the internet for free (Elliot, 2018), and it has been reported that some government departments will refer clients who do not have internet access to the public library where they can connect with digital government services (Local Government of New Zealand & Public Libraries of New Zealand, 2012, p.14). In addition, libraries have also become central sites for “national policy focused on digital equity and universal service” (Strover et.al., 2020, p.247), demonstrated by their involvement in a range of national and local programs to extend and support digital inclusion within communities. In this paper, the services, facilities and programs offered by public libraries to support digital inclusion are termed “digital inclusion services” (DIS), many of which are delivered through static library buildings or service points. While these serve the majority of library users, Aotearoa New Zealand, by OECD standards, is sparsely populated (Statistics New Zealand, 2005), with a large and scattered non-urban population that cannot always access static delivery points conveniently. Given the large non-urban population in Aotearoa New Zealand, mobile libraries have the potential to support digital inclusion within these communities, but we do not know whether or how they do. Several studies have focused on static library services to non-urban communities, and their role in supporting digital inclusion (Strover et al., 2020; Mehra, 2020). There is, however, limited recent research concerning mobile libraries in general, and even less investigating the ways in which they contribute to digital inclusion. This paper aims to address this by drawing on

research exploring the role mobile libraries play in digital inclusion for non-urban communities in Aotearoa New Zealand (authors), guided by these research questions:

RQ1: What digital inclusion services do mobile libraries provide to non-urban areas of Aotearoa New Zealand?

RQ2: What challenges do mobile librarians face in providing digital inclusion services?

“Digital inclusion” refers to an end state in which everyone has equitable opportunities to participate in society using digital technologies (Digital Inclusion Research Group, 2017), and “non-urban” simply indicates that an area is not a main urban center. This is guided by a population-based classification used by Grimes and White (2019, p.24). The categories of larger country towns (10,000 – 25,000 population), country towns, and rural areas (under 10,000 population), are combined, and referred to as “non-urban areas”.

Literature review

Digital Inclusion and Non-Urban Communities

Early studies of digital inequality focused on internet adoption and the binary framework of internet ‘haves’ or ‘have-nots’, naming the gap between the two the ‘digital divide’ (Jaeger et al., 2012). This understanding was seen as too narrow, however, and a call was made for a more complex approach (Bertot, 2003; Warschauer, 2003; Van Dijk, 2005). The terms digital inclusion and exclusion appear to have entered the scholarly literature in the early 2000s (e.g. Fitch, 2002) and, as noted, have come to mean the difference between those with the opportunity to use digital technologies and services for social and economic purposes and those without that

opportunity. In 2019, the government in Aotearoa New Zealand released their Digital Inclusion Blueprint (DIA, 2019a). This document outlines the role of the government in achieving digital inclusion, while also identifying existing initiatives and gaps in provision. The Blueprint centers around the four factors of access, skills, motivation, and trust required for digital inclusion. The access element is positioned as a first-level factor and conceived as having three facets - connectivity, affordability and accessibility - suggesting that digital inclusion relies on the necessary infrastructure being in place, that people can afford to connect to it, and afford Internet-enabled devices. The accessibility facet refers to being able to find necessary and relevant content. This relates to the second-level element of skills - having the ability to use Internet hardware and software effectively. Motivation and trust are positioned as third-level factors. Motivation refers to having a reason and desire to go online. Finally, trust is an aspect of digital inclusion that has perhaps not attracted as much attention as the other elements. It is, to some extent, related to motivation because those lacking trust in online services and interactions are likely to avoid engaging with them.

The Blueprint acknowledges that residents of rural or non-urban communities are amongst those at most risk of not being digitally included (DIA, 2019a). Published research has similarly identified people living in non-urban communities as a group at particular risk of digital exclusion (Gann, 2019; Real et al., 2014; Freeman & Park, 2015). In Aotearoa New Zealand, analysis indicates that residents of larger country towns experience the lowest levels of internet access (87.44%), along with country towns (88.59%) and rural areas (90.39%), compared to major cities (92.73%) (Grimes & White, 2019, p.24). These figures show that internet access is high, even in non-urban areas (RBUS, 2018; Grimes & White, 2019; Digital Inclusion Research Group, 2017; 20/20 Trust, 2017) and programs such as the Rural Broadband Initiative (RBI) aim to

increase access further (Crown Infrastructure Partners, 2018). Nevertheless, despite these relatively high connectivity rates, those living in non-urban areas of Aotearoa New Zealand may still not be digitally included (Sylvester et al., 2017; Digital Inclusion Research Group, 2017); the Rural Broadband Usage Survey (RBUS) identified that even when the RBI achieved over 90% access in rural areas, there remained barriers to the effective use of broadband internet (RBUS, 2018).

The Role of Public Libraries

As one of the few institutions offering many services free of charge, public libraries are a key location for the promotion of digital inclusion (Noh, 2019; Gann, 2019), and contribute through a range of services, including public access to the internet, digital devices, and digital content; digital literacy and technology training; (Bertot et al., 2015; Noh, 2019; Mehra et al., 2020) and information in accessible formats (Beyene, 2018). In Aotearoa New Zealand, the government has recognized inequalities in digital inclusion, and one of the measures implemented to mitigate this is the use of public libraries as technology hubs (Sylvester et al., 2017). This is evident in three programs: the Aotearoa People's Network Kaharoa (APNK), Stepping UP, and Skinny Jump. Funded by the National Library of New Zealand in partnership with local councils, APNK provides "free and facilitated access to the internet and computer technology" in public libraries to enable all New Zealanders to become connected online (National Library, n.d., para. 1). Stepping UP is run by the Digital Inclusion Alliance Aotearoa (DIAA) in collaboration with public libraries and community centers. The program provides free, community-based training to build digital skills and knowledge through 38 training modules delivered at 93 locations which are predominantly libraries (DIAA, n.d.). Skinny Jump is also managed by the DIAA and provides heavily subsidized,

flexible prepaid broadband and a free modem to those families recognized as being at most risk of digital exclusion (Skinny Jump, n.d.). As Skinny Jump partners, local libraries help to determine which families are eligible for the service, as well as providing support to set up and maintain the broadband connection.

In non-urban areas with poor quality, unaffordable or unavailable internet connectivity, and a lack of access to professionals who can assist with digital literacy tasks, DIS offered by public libraries are particularly important (Strover et al., 2020; Thiele, 2016). The provision of free public access to the Internet, computers, and printing facilities (Bishop et al., 2016), as well as computer and technology training (Hancks, 2012) by non-urban libraries has been shown to support the economic development of their surrounding communities. Recent research investigating the use of technology by non-urban libraries to promote community engagement has shown evidence that this may also help to overcome marginalization and bridge digital divides (Mehra et al., 2020). There has, therefore, been much discussion about how static public library service points support digital inclusion within communities generally, and also some specifically in non-urban communities but less focus on the contribution of mobile libraries. Given that mobile libraries predominantly serve dispersed or non-urban communities (Stringer, 2010), their potential for supporting digital inclusion within these communities has perhaps been overlooked.

Mobile Libraries and Digital Inclusion

Mobile libraries play a vital role in bringing library services to those without access to a static public library (Hawke & Jenks, 2005; Stringer, 2010). The contribution of mobile libraries to digital inclusion has been discussed in the literature but is not often the main focus. The issue of digital inclusion has, for example, been raised in articles which

discuss the upgrade of mobile library fleets (Clancy, 2003), and the adoption of new technology by mobile libraries (Monley & Pestell, 1996). Mobile makerspaces and fabrication labs have also been discussed as a way of taking new, creative technologies to patrons who cannot access static maker locations (Moorefield-Lang, 2015; de Boer, 2015). In Australia, Knight and Makin (2006) explored the transformation of mobile libraries from basic bookmobiles to ‘branches on wheels’ which offer a full range of public library services including access to the internet and new technologies.

Professional guidelines for mobile library provision also touch on the requirement for mobile libraries to act as ‘mini-branches’, providing public access computers, copying facilities, access to online reference works and the provision to download (Stringer, 2010). IFLA mobile library guidelines refer to the ‘cybermobile’ – a specialist mobile library containing internet access, computers, and provision to scan, photocopy, and access digital material in various formats (Stringer, 2010). Empirical research on how these operate and the challenges faced is scarce, however.

To summarize, while existing literature provides a clear picture of the barriers to digital inclusion in non-urban areas, and highlights the potential of public libraries to foster digital inclusion within these communities, there has been little attention paid to the interaction of mobile libraries, DIS, and non-urban communities. To increase our knowledge and understanding of this topic, the research on which this paper is based focused on how mobile libraries contribute to digital inclusion in non-urban areas of Aotearoa New Zealand and the challenges faced by mobile librarians in providing DIS.

Methodology

Research design

A descriptive qualitative exploratory study was designed, with a focus on mobile

librarians. Given the lack of research in the area of this study, an explorative approach was considered most appropriate to gain insight into issues surrounding the topic (Leedy & Ormrod, 2015). Exploratory research is usually undertaken when a research problem is at a preliminary stage and is not intended to offer final and conclusive solutions or evidence but rather facilitate a better understanding of the issues and factors at play in the research area (Saunders et al., 2012). Exploratory studies are therefore useful when there is a need to find out more about a topic and when there is scant existing information about the nature of the phenomenon being studied. Within exploratory research, the aim is not to encompass and analyse all aspects of a phenomenon, but to uncover and discuss specific patterns relevant to the aim of the study (Malterud et al., 2016). A qualitative research design alongside deductive and inductive reasoning was thus considered appropriate and yielded a rich description of the topic of digital inclusion services on mobile libraries in Aotearoa New Zealand.

Sample

A small and purposeful sample of mobile librarians was selected. The goal in selecting this unique sample was to gain insight from those closest to the provision of service, who interact with both the patrons of mobile library services as well as the branch libraries that provide them. A directory of libraries in Aotearoa New Zealand (National Library, n.d.a.) was used to identify possible participants. The website of each public library was viewed and 12 libraries that appeared to operate a mobile library were identified and emailed directly. Three libraries responded that they operated only within main urban centers and therefore did not fit the project scope. Ultimately, recruitment emails yielded six staff members from five libraries willing to participate. This sample is small, but nonetheless represents approximately 55% of public libraries offering

mobile library services to non-urban areas in Aotearoa New Zealand.

The research was granted approval by the [University] Human Ethics Committee (application no. 0000028732). Participants were emailed an information sheet about the project as well as individual and organisational consent forms. Signed consent forms were returned electronically and an interview date was organized.

A multi-site and multi-person approach allowed the researcher to speak to mobile participants from a range of locations, aiming to capture “the diversity in experiences [of people] living in various geographical and cultural settings” (Leedy & Ormrod, 2017, p.280).

Data Collection and Analysis

Data was collected through semi-structured, person-to-person interviews. The interviews were undertaken in 2020, during the first year of the Covid-19 pandemic and travel restrictions meant that interviews were conducted by telephone or via Zoom. Interviews were chosen as they are shown to yield high response rates (Leedy & Ormrod, 2015, p.160) and to collect rich and complex data from which findings can be drawn. Because little is known about the area of this study, the exploratory and flexible nature of the semi-structured interview format was vital. Participants were encouraged to articulate what was important to them in their own terms, while still enabling the researcher to guide the interview, and respond to new ideas on the topic (Merriam, 2009, p.90). Interviews were recorded then transcribed verbatim, and inductive and deductive analysis was applied to one interview before first- and second-cycles of coding took place. First-cycle coding produced an initial list of codes, which was used to analyze remaining transcripts. Using axial coding a final list of codes and subcodes

was developed, with definitions and examples to guide further analyses. Second-cycle coding was then undertaken, with all transcripts analyzed sentence by sentence using the final code list.

Findings

Deductive analysis revealed a number of themes which are discussed below and organized around the research questions noted in the Introduction.

Digital inclusion services on mobile libraries in non-urban areas of Aotearoa

New Zealand

When discussing DIS provision, many participants' comments corresponded with the Digital Inclusion Blueprint themes of access, skills, motivation, and trust (DIA, 2019a), and this framework is reflected in the reporting of the findings.

Access

The participating mobile librarians offered a wide range of digital inclusion services (DIS) to non-urban communities, the majority of which related to the theme of access. Participants primarily discussed internet access, with four out of five mobile libraries offering free Wi-Fi, and two providing Skinny broadband. Where Wi-Fi was not offered, the participant stated that it had been trialed, but discontinued due to low use:

...we really didn't have a lot of uptake with the Wi-Fi, [...] honestly, everyone seemed to have things on their phone.

Three other participants also commented that although they provided free Wi-Fi, patron use remained low. This is discussed further below under RQ2. Access to digital

devices was also offered by all participants, including iPads, Chromebooks, laptops and a stationary computer, as well as printing, photocopying and scanning equipment. One participant mentioned that this gave patrons the opportunity to try digital technology before purchasing it themselves. The participant recounted giving advice to a grandmother who frequently brought her mokopuna¹ to a robotics group:

...the following week she would come in and say, could you write down exactly what it is? [...] So I'm [...] looking it up, ok, look I'm going to email you, this is the product description, this is where you get it from, oh they've got one in stock in [town] at [shop].

Three mobile libraries provided access to technologies such as virtual reality headsets, robots and robotic kits, light pads, and 3D printers. One participant was considering providing digital conferencing equipment so that children in remote areas could participate in book or coding clubs held at branch libraries. Another interviewee emphasized the importance of providing access to non-urban schools that may be ill-equipped in terms of digital technologies and skilled staff:

...a school that might have 25 students, be incredibly rural, the service we offer is disproportionately important to them in terms of digital technologies. [...] If we can take our coding laptops or our robots, [...] they don't have that stuff.

Skills

Participants commented frequently on supporting patrons' digital skills to help them use the internet and digital technology, reporting that these services may be part of planned

¹ Te Reo Māori: grandchildren or descendants.

programming or ad-hoc. Librarians on three mobile libraries offered skills-based programs, and a fourth planned to do so. Activities in this area were usually library-focused, such as teaching patrons how to log into their library accounts, download e-books and audio books, and access online material. Interviewees also discussed programs related to new technologies, including coding and robotic programming, 3D printing, and digital literacy. Three participants noted that skills-based assistance was often ad-hoc, which again often centered around the use of digital technology for library-related purposes. This included assisting patrons to access e-books and e-magazines, and use library websites and software. One participant mentioned an ad-hoc query from a patron who lived in an isolated area, had difficulty accessing a physical library, and had recently gained access to the internet through Skinny Jump broadband:

I demonstrated on my computer how to access e-magazines as she'd been having some trouble previously [...]. She went away knowing that she could actually get the magazines she wanted via the internet and vowed to give it a go....

Ad-hoc assistance with digital tasks that were not library-related included requests for help with internet banking, listing items on internet auction websites, use of personal digital devices, and using digital technology to make community funding applications and apply for jobs. One interviewee noted that the type of assistance required by patrons differed along with varying internet access, commenting that patrons from areas with poor internet service required assistance with basic tasks like using the library app, whereas those from areas with higher internet connectivity may seek to perform more complex tasks or utilise new technology.

Motivation and trust

Far fewer participant comments related to the themes of motivation and trust - showing patrons how digital technology can help them meaningfully, and building trust to use digital technology safely. The majority of comments related to motivation came from one participant who made a strong effort to encourage patrons to use digital services when they were introduced:

It took them a while to get used to it, that they could access the internet and all of that. So that was quite a lot of me gently pushing that side of the new service because they were so used to the older one.

Two additional interviewees also touched on issues of motivation when discussing potential programming focused on intentional non-users of digital technology, and the need for mobile librarians to promote the use of digital collections.

Trust was mentioned by two participants when discussing assistance with personal digital devices. One participant used the example of helping a patron to update her iPad:

...she could have done it by herself [...] but I think sometimes people just want someone with them, [...] sometimes that's all it is, we're just sitting here [...], and they're actually doing all the work but it's like a security blanket while they do it.

Another interviewee discussed the trust that patrons held in public libraries generally and how this can help promote the ability of librarians to help with digital technology:

...people really trust libraries and the people who work at them, with helping them with their digital stuff, and it's something we actively advertise as well, [...]: Do you need help with your iPad? Come talk to your local librarian.

One interviewee noted that this trusted position could also be problematic, however, as patrons may request assistance with tasks such as internet banking:

It's tricky right, for librarians, because we're like, oh we can't transfer money for you, you have to do that for yourself. But there is a huge cry for support...

Challenges and Benefits of Providing Digital Inclusion Services on Mobile Libraries

All participants identified a range of challenges in providing DIS. These are discussed below under the sub-themes of patron use, staffing, physical, scheduling, Covid-19, finance, and measurability. Some interviewees commented on benefits to the library service and these are also reported.

Patron Use

The highest number of comments regarding challenges in the provision of DIS were associated with patron use. One participant had discontinued free Wi-Fi access due to low patron use, and of the remaining four mobile libraries, staff from three commented that patron use remained low:

It's not used at all. You know you advertise that we've got it, we're paying for it, and I think the staff use it more than any customer ever.

One interviewee stated that they had also ceased offering access to printing and photocopying equipment due to low use, and the same participant mentioned that this was a contributing factor when deciding whether to introduce other digital technology.

Patron interest and skill level in the use of digital technology was also discussed.

One participant reported having many elderly patrons who were not interested in e-

books, and varying levels of skill proved difficult when running programs aimed at this group:

...we'll [...] take some iPads and try to do a little bit of digital instruction, but it's been, it's very unsuccessful. The skill level of the participants and what they really want is just so varied.

Staffing

Staffing challenges were associated primarily with varying staff attitudes to digital technologies, and with practical staffing issues. Interviewees from two mobile libraries discussed challenges related to staff attitudes, interest, and familiarity with digital technology, with one stating that:

...everyone in the team has [a] slightly different level of comfort with it, and I think some of us promote it far more than others. Others probably wouldn't think about it.

Practical staffing issues were primarily related to the number of staff who worked on the mobile library at any one time. One participant discussed the nature of being a 'solo-operator' and the difficulty this caused when patrons required assistance with digital technology:

...you can't sit down and talk to someone for five or ten minutes or teach them how to get an email. [...] the fact that we're sole operating, we can do those quick and dirty little queries, but we can't do anything more in-depth.

Physical Challenges and Scheduling

All participants mentioned physical challenges. When replacing older mobile library

vehicles, there is now generally a preference for smaller vehicles that do not require drivers to have a heavy transport license, but this can be a limiting factor when offering access to digital technologies or skill-based programming as one participant observed:

...see our van [is] pretty small already, and [...] there's not really a lot of space on it for a desk or a computer for someone to sit down and do their stuff.

One interviewee reported that a reliance on batteries to run digital equipment could also be challenging and was a factor when deciding whether to continue providing access to a computer, printer and photocopier on a new mobile library.

Challenges of scheduling were also identified, with one participant indicating that low uptake of free Wi-Fi may be related to a schedule made up of short stops. This interviewee continued by discussing the implementation of new schedules in which longer stops allowed patrons more time to access digital services. Similarly, four interviewees acknowledged that in order to provide DIS, longer periods of time spent in the community were required.

The Impact of COVID-19

All interviewees identified challenges related to Covid-19. One participant had only recently begun to provide DIS. Their second 'pop-up' library was due to take place when a national lockdown began and was unable to proceed. This interviewee also mentioned that lockdowns had prevented coding workshops and a regular robotics group from taking place. Another interviewee noted that older patrons who did not have access to the internet, or the skills to access digital materials, were especially excluded throughout Covid-19 lockdowns. The participant observed an increasing interest in e-books from older patrons, and related this to the potential benefit of higher digital engagement:

...they had no books for like three months, [...] it was just ripped out from under them, and that's why it would be good if they did have more ability.

One participant had been involved in an outreach survey conducted during a Covid-19 lockdown and reported expressions of vulnerability felt by residents of non-urban communities. Respondents to the survey expressed a desire for internet training and assistance with tasks such as internet banking. Despite the challenges brought by the pandemic, two participants noted that the nationwide lockdowns had provided a valuable opportunity for them to take stock and to invest time in the planning and strategy of mobile library services.

Finance and Performance Measurement

Three participants commented on challenges of a financial nature. One interviewee was awaiting funding for the purchase of a new mobile library, and until then was delivering mobile library services and DIS from a domestic vehicle. Low uptake of DIS also contributed to challenges in accessing funding, as one participant discussed:

We got Wi-Fi on the buses two and a half years ago and that was quite a big struggle to get the acceptance of funding for it really, [...] because it's not used much.

This highlights the challenges related to the measurability of DIS but it was mentioned explicitly by only one participant. The interviewee planned to implement more DIS but expressed concern that the success of these could not be captured by traditional, circulation-based measures.

Benefits of Providing DIS on Mobile Libraries

Participants also reported benefits to their library service in providing DIS. On one mobile library where patron use of Wi-Fi was very low, the mobile librarian noted that this access was still beneficial to staff when familiarizing patrons with the library's digital interfaces. Where free internet access was provided through APNK, the participant reported benefits of cost and security to the library:

...so the fact we can add that into our annual subscription and they do the back end and stuff, rather than us having to set up a kind of independent. [...] It's also safe, you know [...] it's running through the DIA National Library security systems...

One interviewee commented that, as their smaller mobile library carried fewer print books, the importance of supporting patrons to access digital resources grew. This support then facilitated a rise in e-book readership. Greater patron familiarity and use of digital library resources may also free up staff time, and assist mobile librarians who wished to implement less-regular, and more responsive scheduling:

Having the digital library is a really key part of our strategy around lending. If we can encourage our customers to use the digital library, which is open 24/7, then we might not need to go every four weeks.

Discussion

Many digital inclusion services offered by mobile libraries in non-urban areas of Aotearoa New Zealand appear to target first-level inclusion related to access, supporting research that shows that even when the internet is widely available (as it is in Aotearoa New Zealand), first-level digital exclusion may persist in the form of access to devices,

or expenses related to the maintenance of hardware, software, and subscriptions (Van Deursen & Van Dijk, 2019). However, many interviewees reported that although they offered access to the internet and digital technologies, patron use remained low. It is unclear whether this was because patrons were already digitally included, or due to a lack of skills, motivation or trust. If the first of these, this calls into question one of the primary assumptions made in this study, that those living in non-urban communities are at risk of digital exclusion, and is an area that requires further investigation.

Participants also offered DIS related to second-level, skill-based inclusion, and most interviewees reported a desire or need among their patrons for assistance in this area. These findings are in keeping with the notion that access to technology does not automatically provide the user with all the associated benefits (Scheerder et al., 2017), and that the key to taking full advantage of the RBI in Aotearoa New Zealand is now associated with effective use of the internet, rather than just access alone (RBUS, 2018).

Third-level inclusion associated with motivation and trust was mentioned far less frequently by participants, and DIS targeting these aspects appeared to be minimal. One interviewee, however, seemed to be very aware of the issue of motivation, and their comments indicated a conscious effort to increase their patrons' motivation to utilise the DIS provided. The Digital Inclusion Blueprint describes trust as a person's level of trust in the internet and online services, and their ability to use the internet and "avoid scams, harmful communication and misleading information" (DIA, 2019a, p.10). In this research project, statements from participants regarding trust were limited, and was predominantly discussed in terms of the trust patrons had in libraries and their staff. Although the theme of trust is not discussed here in the same context as that understood in the digital inclusion strategy, comments regarding trust indicated that, in general, patrons trusted mobile librarians. Human intermediaries fulfil a critical role in brokering

the interaction between people and information to create digitally included communities (Mervyn et al., 2014), and it is worth noting that participants who discussed the role of motivation and trust when delivering DIS, also reported issues of low patron use less frequently. Although only anecdotal, it would be of benefit to collect more information about the relationship between these factors.

By offering DIS, participating mobile libraries support digital inclusion in their non-urban communities, and research has suggested that where there is low connectivity and a lack of skilled professionals, DIS offered by public libraries are particularly important (Strover et al., 2020; Thiele, 2016). This is especially evident in participant comments regarding the vital nature of DIS offered to remote schools who face issues of low connectivity and a lack of staff with digital skills. Suggestions that access to the Internet and digital technology (Bishop et al., 2016) through non-urban libraries supports the economic development of surrounding communities also ring true alongside participants' reports of the use of DIS for community funding and job applications.

While literature related to the challenges faced by mobile libraries when delivering DIS is limited, static non-urban libraries have been found to experience persistent problems with low staffing levels, a reliance on limited local funding (Real et al., 2014) and poor telecommunications infrastructure (Thiele, 2016; Bishop et al., 2016; Mehra et al., 2020). Real and Rose (2017) also identified that small, aging buildings, limited staff funding, and a lack of mechanisms for collaboration make it difficult for non-urban libraries to keep up with changes in the field by offering digital services. Some challenges reported in this study align with those identified in previous work in this area. Interviewees discussed low staffing levels in the form of difficulties finding drivers for mobile libraries, especially when a heavy transport license was

required, and challenges associated with small and aging buildings may also have similarities with those of aging, or smaller mobile library vehicles. Overall however, it appears that due to their intrinsically mobile nature, many of the challenges faced by mobile libraries are unique. These findings highlight a gap in existing literature and an opportunity for further research.

Conclusion

This study aimed to begin closing a gap in available literature by investigating how mobile libraries contribute to digital inclusion in non-urban communities of Aotearoa New Zealand. Analysis of interview data revealed findings which indicate that mobile libraries contribute positively to digital inclusion in a wide variety of ways and have the potential to fulfil an important role in promoting digital inclusion in the non-urban communities they serve. The topic of digital inclusion is multi-faceted and complex, and this research project identified, and touched lightly on a large number of important issues. As there is minimal research related to mobile libraries in these areas, many of the issues would benefit from in-depth investigation in their own right. Specifically, by focusing only on the perspective of mobile librarians, this study does not capture the experiences of mobile library patrons, or intentional non-users of mobile library services. Future research which investigates DIS from a patron perspective would be of value. Despite these limitations, the qualitative data captured in this research project begins to build a rich picture of how mobile libraries contribute to digital inclusion in non-urban areas of Aotearoa New Zealand.

Limitations

As noted in the Methodology section, the study was exploratory and, due to time

constraints and participant responses, the number of participants was limited to only six staff from five libraries. This small sample size does not allow for generalized conclusions to be drawn on the topic and, given the exploratory nature of this research, the results should be viewed as preliminary evidence that warrants further investigation. It is highly unlikely that saturation (Glaser & Strauss, 1999) was achieved and this was not the aim of this exploratory work, but the richness of the dialogue generated through the interviews provide interesting avenues for future research in the area.

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Mobile libraries and digital inclusion: A study from Aotearoa New Zealand

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Mobile libraries and digital inclusion: A study from Aotearoa New Zealand

Mobile libraries serve communities in a range of ways throughout Aotearoa New Zealand and internationally but their contribution to supporting digital inclusion in non-urban areas has not been explored in depth. This paper *presents data from an exploratory research project focused on* how mobile libraries in Aotearoa New Zealand extend *digital services* to those who cannot access *public library* buildings services *conveniently*. *The findings show* that the mobile librarians provide a range of digital inclusion services, predominantly access to technologies and skills development *and, by so doing*, contribute positively to digital inclusion in non-urban areas of Aotearoa New Zealand.

Keywords: public libraries; mobile libraries; digital inclusion; digital skills; digital access

Introduction

Digital technologies are assuming ever greater importance for people's participation in modern social, professional, and civic life (Jaeger et al., 2012). As the government in Aotearoa New Zealand moves towards government and public services that are digital by default (Department of Internal Affairs (DIA), 2020) and people increasingly "communicate and transact online" (Park et al., 2019, p.139) it is important that everyone has the opportunity to be digitally included. This means that they should be able to access "affordable and accessible digital devices and services at a time and place convenient to them, as well as the motivation, skills and trust to use the internet and pursue and realize meaningful social and economic outcomes" (Digital Inclusion Research Group, 2017, p.5). Those without internet access have been found to have lower subjective well-being than others, are less likely to be civically engaged through activities such as voting or signing a petition (Grimes & White, 2019), and report experiencing isolation, powerlessness, and limited opportunity (Elliot, 2018) as a

consequence of their digital exclusion. People living in non-urban areas are recognized as one group at risk of not being digitally included (Gann, 2019; Kos-Łabędowicz, 2017; Park, 2017).

In Aotearoa New Zealand, people with limited internet access often cite their local library as a place they can access the internet for free (Elliot, 2018), and it has been reported that some government departments will refer clients who do not have internet access to the public library where they can connect with digital government services (Local Government of New Zealand & Public Libraries of New Zealand, 2012, p.14). In addition, libraries have also become central sites for “national policy focused on digital equity and universal service” (Strover et.al., 2020, p.247), demonstrated by their involvement in a range of national and local programs to extend and support digital inclusion within communities. In this paper, the services, facilities and programs offered by public libraries to support digital inclusion are termed “digital inclusion services” (DIS), many of which are delivered through static library buildings or service points. While these serve the majority of library users, Aotearoa New Zealand, by OECD standards, is sparsely populated (Statistics New Zealand, 2005), with a large and scattered non-urban population that cannot always access static delivery points conveniently. Given the large non-urban population in Aotearoa New Zealand, mobile libraries have the potential to support digital inclusion within these communities, but we do not know whether or how they do. Several studies have focused on static library services to non-urban communities, and their role in supporting digital inclusion (Strover et al., 2020; Mehra, 2020). There is, however, limited recent research concerning mobile libraries in general, and even less investigating the ways in which they contribute to digital inclusion. This paper aims to address this by drawing on

research exploring the role mobile libraries play in digital inclusion for non-urban communities in Aotearoa New Zealand (authors), guided by these research questions:

RQ1: What digital inclusion services do mobile libraries provide to non-urban areas of Aotearoa New Zealand?

RQ2: What challenges do mobile librarians face in providing digital inclusion services?

“Digital inclusion” refers to an end state in which everyone has equitable opportunities to participate in society using digital technologies (Digital Inclusion Research Group, 2017), and “non-urban” simply indicates that an area is not a main urban center. This is guided by a population-based classification used by Grimes and White (2019, p.24). The categories of larger country towns (10,000 – 25,000 population), country towns, and rural areas (under 10,000 population), are combined, and referred to as “non-urban areas”.

Literature review

Digital Inclusion and Non-Urban Communities

Early studies of digital inequality focused on internet adoption and the binary framework of internet ‘haves’ or ‘have-nots’, naming the gap between the two the ‘digital divide’ (Jaeger et al., 2012). This understanding was seen as too narrow, however, and a call was made for a more complex approach (Bertot, 2003; Warschauer, 2003; Van Dijk, 2005). The terms digital inclusion and exclusion appear to have entered the scholarly literature in the early 2000s (e.g. Fitch, 2002) and, as noted, have come to mean the difference between those with the opportunity to use digital technologies and services for social and economic purposes and those without that

1 opportunity. In 2019, the government in Aotearoa New Zealand released their Digital
2 Inclusion Blueprint (DIA, 2019a). This document outlines the role of the government in
3 achieving digital inclusion, while also identifying existing initiatives and gaps in
4 provision. The Blueprint centers around the four factors of access, skills, motivation,
5 and trust required for digital inclusion. The access element is positioned as a first-level
6 factor and conceived as having three facets - connectivity, affordability and accessibility
7 - suggesting that digital inclusion relies on the necessary infrastructure being in place,
8 that people can afford to connect to it, and afford Internet-enabled devices. The
9 accessibility facet refers to being able to find necessary and relevant content. This
10 relates to the second-level element of skills - having the ability to use Internet hardware
11 and software effectively. Motivation and trust are positioned as third-level factors.
12 Motivation refers to having a reason and desire to go online. Finally, trust is an aspect
13 of digital inclusion that has perhaps not attracted as much attention as the other
14 elements. It is, to some extent, related to motivation because those lacking trust in
15 online services and interactions are likely to avoid engaging with them.

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17 The Blueprint acknowledges that residents of rural or non-urban communities
18 are amongst those at most risk of not being digitally included (DIA, 2019a). Published
19 research has similarly identified people living in non-urban communities as a group at
20 particular risk of digital exclusion (Gann, 2019; Real et al., 2014; Freeman & Park,
21 2015). In Aotearoa New Zealand, analysis indicates that residents of larger country
22 towns experience the lowest levels of internet access (87.44%), along with country
23 towns (88.59%) and rural areas (90.39%), compared to major cities (92.73%) (Grimes
24 & White, 2019, p.24). These figures show that internet access is high, even in non-urban
25 areas (RBUS, 2018; Grimes & White, 2019; Digital Inclusion Research Group, 2017;
26 20/20 Trust, 2017) and programs such as the Rural Broadband Initiative (RBI) aim to

1 increase access further (Crown Infrastructure Partners, 2018). Nevertheless, despite
2 these relatively high connectivity rates, those living in non-urban areas of Aotearoa
3 New Zealand may still not be digitally included (Sylvester et al., 2017; Digital Inclusion
4 Research Group, 2017); the Rural Broadband Usage Survey (RBUS) identified that
5 even when the RBI achieved over 90% access in rural areas, there remained barriers to
6 the effective use of broadband internet (RBUS, 2018).
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16 ***The Role of Public Libraries***

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18 As one of the few institutions offering many services free of charge, public libraries are
19 a key location for the promotion of digital inclusion (Noh, 2019; Gann, 2019), and
20 contribute through a range of services, including public access to the internet, digital
21 devices, and digital content; digital literacy and technology training; (Bertot et al., 2015;
22 Noh, 2019; Mehra et al., 2020) and information in accessible formats (Beyene, 2018).
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24 In Aotearoa New Zealand, the government has recognized inequalities in digital
25 inclusion, and one of the measures implemented to mitigate this is the use of public
26 libraries as technology hubs (Sylvester et al., 2017). This is evident in three programs:
27 the Aotearoa People's Network Kaharoa (APNK), Stepping UP, and Skinny Jump.
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29 Funded by the National Library of New Zealand in partnership with local councils,
30 APNK provides “free and facilitated access to the internet and computer technology” in
31 public libraries to enable all New Zealanders to become connected online (National
32 Library, n.d., para. 1). Stepping UP is run by the Digital Inclusion Alliance Aotearoa
33 (DIAA) in collaboration with public libraries and community centers. The program
34 provides free, community-based training to build digital skills and knowledge through
35 38 training modules delivered at 93 locations which are predominantly libraries (DIAA,
36 n.d.). Skinny Jump is also managed by the DIAA and provides heavily subsidized,
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flexible prepaid broadband and a free modem to those families recognized as being at most risk of digital exclusion (Skinny Jump, n.d.). As Skinny Jump partners, local libraries help to determine which families are eligible for the service, as well as providing support to set up and maintain the broadband connection.

In non-urban areas with poor quality, unaffordable or unavailable internet connectivity, and a lack of access to professionals who can assist with digital literacy tasks, DIS offered by public libraries are particularly important (Strover et al., 2020; Thiele, 2016). The provision of free public access to the Internet, computers, and printing facilities (Bishop et al., 2016), as well as computer and technology training (Hancks, 2012) by non-urban libraries has been shown to support the economic development of their surrounding communities. Recent research investigating the use of technology by non-urban libraries to promote community engagement has shown evidence that this may also help to overcome marginalization and bridge digital divides (Mehra et al., 2020). There has, therefore, been much discussion about how static public library service points support digital inclusion within communities generally, and also some specifically in non-urban communities but less focus on the contribution of mobile libraries. Given that mobile libraries predominantly serve dispersed or non-urban communities (Stringer, 2010), their potential for supporting digital inclusion within these communities has perhaps been overlooked.

Mobile Libraries and Digital Inclusion

Mobile libraries play a vital role in bringing library services to those without access to a static public library (Hawke & Jenks, 2005; Stringer, 2010). The contribution of mobile libraries to digital inclusion has been discussed in the literature but is not often the main focus. The issue of digital inclusion has, for example, been raised in articles which

1 discuss the upgrade of mobile library fleets (Clancy, 2003), and the adoption of new
2 technology by mobile libraries (Monley & Pestell, 1996). Mobile makerspaces and
3 fabrication labs have also been discussed as a way of taking new, creative technologies
4 to patrons who cannot access static maker locations (Moorefield-Lang, 2015; de Boer,
5 2015). In Australia, Knight and Makin (2006) explored the transformation of mobile
6 libraries from basic bookmobiles to ‘branches on wheels’ which offer a full range of
7 public library services including access to the internet and new technologies.
8 Professional guidelines for mobile library provision also touch on the requirement for
9 mobile libraries to act as ‘mini-branches’, providing public access computers, copying
10 facilities, access to online reference works and the provision to download (Stringer,
11 2010). IFLA mobile library guidelines refer to the ‘cybermobile’ – a specialist mobile
12 library containing internet access, computers, and provision to scan, photocopy, and
13 access digital material in various formats (Stringer, 2010). Empirical research on how
14 these operate and the challenges faced is scarce, however.

15 To summarize, while existing literature provides a clear picture of the barriers to
16 digital inclusion in non-urban areas, and highlights the potential of public libraries to
17 foster digital inclusion within these communities, there has been little attention paid to
18 the interaction of mobile libraries, DIS, and non-urban communities. To increase our
19 knowledge and understanding of this topic, the research on which this paper is based
20 focused on how mobile libraries contribute to digital inclusion in non-urban areas of
21 Aotearoa New Zealand and the challenges faced by mobile librarians in providing DIS.

22 **Methodology**

23 ***Research design***

24 A descriptive qualitative exploratory study was designed, with a focus on mobile

1 librarians. Given the lack of research in the area of this study, an explorative approach
2 was considered most appropriate to gain insight into issues surrounding the topic
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4 (Leedy & Ormrod, 2015). Exploratory research is usually undertaken when a research
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6 problem is at a preliminary stage and is not intended to offer final and conclusive
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8 solutions or evidence but rather facilitate a better understanding of the issues and factors
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10 at play in the research area (Saunders et al., 2012). Exploratory studies are therefore
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12 useful when there is a need to find out more about a topic and when there is scant
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14 existing information about the nature of the phenomenon being studied. Within
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16 exploratory research, the aim is not to encompass and analyse all aspects of a
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18 phenomenon, but to uncover and discuss specific patterns relevant to the aim of the
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20 study (Malterud et al., 2016). A qualitative research design alongside deductive and
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22 inductive reasoning was thus considered appropriate and yielded a rich description of
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24 the topic of digital inclusion services on mobile libraries in Aotearoa New Zealand.
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32 *Sample*

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34 A small and purposeful sample of mobile librarians was selected. The goal in selecting
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36 this unique sample was to gain insight from those closest to the provision of service,
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38 who interact with both the patrons of mobile library services as well as the branch
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40 libraries that provide them. A directory of libraries in Aotearoa New Zealand (National
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42 Library, n.d.a.) was used to identify possible participants. The website of each public
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44 library was viewed and 12 libraries that appeared to operate a mobile library were
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46 identified and emailed directly. Three libraries responded that they operated only within
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48 main urban centers and therefore did not fit the project scope. Ultimately, recruitment
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50 emails yielded six staff members from five libraries willing to participate. This sample
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52 is small, but nonetheless represents approximately 55% of public libraries offering
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mobile library services to non-urban areas in Aotearoa New Zealand.

The research was granted approval by the [University] Human Ethics Committee (application no. 0000028732). Participants were emailed an information sheet about the project as well as individual and organisational consent forms. Signed consent forms were returned electronically and an interview date was organized.

A multi-site and multi-person approach allowed the researcher to speak to mobile participants from a range of locations, aiming to capture “the diversity in experiences [of people] living in various geographical and cultural settings” (Leedy & Ormrod, 2017, p.280).

Data Collection and Analysis

Data was collected through semi-structured, person-to-person interviews. The interviews were undertaken in 2020, during the first year of the Covid-19 pandemic and travel restrictions meant that interviews were conducted by telephone or via Zoom.

Interviews were chosen as they are shown to yield high response rates (Leedy & Ormrod, 2015, p.160) and to collect rich and complex data from which findings can be drawn. Because little is known about the area of this study, the exploratory and flexible nature of the semi-structured interview format was vital. Participants were encouraged to articulate what was important to them in their own terms, while still enabling the researcher to guide the interview, and respond to new ideas on the topic (Merriam, 2009, p.90). Interviews were recorded then transcribed verbatim, and inductive and deductive analysis was applied to one interview before first- and second-cycles of coding took place. First-cycle coding produced an initial list of codes, which was used to analyze remaining transcripts. Using axial coding a final list of codes and subcodes

1 was developed, with definitions and examples to guide further analyses. Second-cycle
2 coding was then undertaken, with all transcripts analyzed sentence by sentence using
3 the final code list.
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8 **Findings**

10 Deductive analysis revealed a number of themes which are discussed below and
11 organized around the research questions noted in the Introduction.
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18 ***Digital inclusion services on mobile libraries in non-urban areas of Aotearoa***

19 ***New Zealand***

21 When discussing DIS provision, many participants' comments corresponded with the
22 Digital Inclusion Blueprint themes of access, skills, motivation, and trust (DIA, 2019a),
23 and this framework is reflected in the reporting of the findings.
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33 ***Access***

34 The participating mobile librarians offered a wide range of digital inclusion services
35 (DIS) to non-urban communities, the majority of which related to the theme of access.
36 Participants primarily discussed internet access, with four out of five mobile libraries
37 offering free Wi-Fi, and two providing Skinny broadband. Where Wi-Fi was not
38 offered, the participant stated that it had been trialed, but discontinued due to low use:
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48 ...we really didn't have a lot of uptake with the Wi-Fi, [...] honestly, everyone
49 seemed to have things on their phone.
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56 Three other participants also commented that although they provided free Wi-Fi,
57 patron use remained low. This is discussed further below under RQ2. Access to digital
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1 devices was also offered by all participants, including iPads, Chromebooks, laptops and
2 a stationary computer, as well as printing, photocopying and scanning equipment. One
3 participant mentioned that this gave patrons the opportunity to try digital technology
4 before purchasing it themselves. The participant recounted giving advice to a
5 grandmother who frequently brought her mokopuna¹ to a robotics group:
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11 ...the following week she would come in and say, could you write down exactly
12 what it is? [...] So I'm [...] looking it up, ok, look I'm going to email you, this
13 is the product description, this is where you get it from, oh they've got one in
14 stock in [town] at [shop].
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24 Three mobile libraries provided access to technologies such as virtual reality
25 headsets, robots and robotic kits, light pads, and 3D printers. One participant was
26 considering providing digital conferencing equipment so that children in remote areas
27 could participate in book or coding clubs held at branch libraries. Another interviewee
28 emphasized the importance of providing access to non-urban schools that may be ill-
29 equipped in terms of digital technologies and skilled staff:
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38 ...a school that might have 25 students, be incredibly rural, the service we offer
39 is disproportionately important to them in terms of digital technologies. [...] If
40 we can take our coding laptops or our robots, [...] they don't have that stuff.
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47 *Skills*

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51 Participants commented frequently on supporting patrons' digital skills to help them use
52 the internet and digital technology, reporting that these services may be part of planned
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60 ¹ Te Reo Māori: grandchildren or descendants.
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1 programming or ad-hoc. Librarians on three mobile libraries offered skills-based
2 programs, and a fourth planned to do so. Activities in this area were usually library-
3 focused, such as teaching patrons how to log into their library accounts, download e-
4 books and audio books, and access online material. Interviewees also discussed
5 programs related to new technologies, including coding and robotic programming, 3D
6 printing, and digital literacy. Three participants noted that skills-based assistance was
7 often ad-hoc, which again often centered around the use of digital technology for
8 library-related purposes. This included assisting patrons to access e-books and e-
9 magazines, and use library websites and software. One participant mentioned an ad-hoc
10 query from a patron who lived in an isolated area, had difficulty accessing a physical
11 library, and had recently gained access to the internet through Skinny Jump broadband:

26 I demonstrated on my computer how to access e-magazines as she'd been
27 having some trouble previously [...]. She went away knowing that she could
28 actually get the magazines she wanted via the internet and vowed to give it a
29 go....

38 Ad-hoc assistance with digital tasks that were not library-related included
39 requests for help with internet banking, listing items on internet auction websites, use of
40 personal digital devices, and using digital technology to make community funding
41 applications and apply for jobs. One interviewee noted that the type of assistance
42 required by patrons differed along with varying internet access, commenting that
43 patrons from areas with poor internet service required assistance with basic tasks like
44 using the library app, whereas those from areas with higher internet connectivity may
45 seek to perform more complex tasks or utilise new technology.

Motivation and trust

Far fewer participant comments related to the themes of motivation and trust - showing patrons how digital technology can help them meaningfully, and building trust to use digital technology safely. The majority of comments related to motivation came from one participant who made a strong effort to encourage patrons to use digital services when they were introduced:

It took them a while to get used to it, that they could access the internet and all of that. So that was quite a lot of me gently pushing that side of the new service because they were so used to the older one.

Two additional interviewees also touched on issues of motivation when discussing potential programming focused on intentional non-users of digital technology, and the need for mobile librarians to promote the use of digital collections.

Trust was mentioned by two participants when discussing assistance with personal digital devices. One participant used the example of helping a patron to update her iPad:

...she could have done it by herself [...] but I think sometimes people just want someone with them, [...] sometimes that's all it is, we're just sitting here [...], and they're actually doing all the work but it's like a security blanket while they do it.

Another interviewee discussed the trust that patrons held in public libraries generally and how this can help promote the ability of librarians to help with digital technology:

...people really trust libraries and the people who work at them, with helping them with their digital stuff, and it's something we actively advertise as well, [...]: Do you need help with your iPad? Come talk to your local librarian.

One interviewee noted that this trusted position could also be problematic, however, as patrons may request assistance with tasks such as internet banking:

It's tricky right, for librarians, because we're like, oh we can't transfer money for you, you have to do that for yourself. But there is a huge cry for support...

Challenges and Benefits of Providing Digital Inclusion Services on Mobile

Libraries

All participants identified a range of challenges in providing DIS. These are discussed below under the sub-themes of patron use, staffing, physical, scheduling, Covid-19, finance, and measurability. Some interviewees commented on benefits to the library service and these are also reported.

Patron Use

The highest number of comments regarding challenges in the provision of DIS were associated with patron use. One participant had discontinued free Wi-Fi access due to low patron use, and of the remaining four mobile libraries, staff from three commented that patron use remained low:

It's not used at all. You know you advertise that we've got it, we're paying for it, and I think the staff use it more than any customer ever.

One interviewee stated that they had also ceased offering access to printing and photocopying equipment due to low use, and the same participant mentioned that this was a contributing factor when deciding whether to introduce other digital technology.

Patron interest and skill level in the use of digital technology was also discussed.

One participant reported having many elderly patrons who were not interested in e-

books, and varying levels of skill proved difficult when running programs aimed at this group:

...we'll [...] take some iPads and try to do a little bit of digital instruction, but it's been, it's very unsuccessful. The skill level of the participants and what they really want is just so varied.

Staffing

Staffing challenges were associated primarily with varying staff attitudes to digital technologies, and with practical staffing issues. Interviewees from two mobile libraries discussed challenges related to staff attitudes, interest, and familiarity with digital technology, with one stating that:

...everyone in the team has [a] slightly different level of comfort with it, and I think some of us promote it far more than others. Others probably wouldn't think about it.

Practical staffing issues were primarily related to the number of staff who worked on the mobile library at any one time. One participant discussed the nature of being a 'solo-operator' and the difficulty this caused when patrons required assistance with digital technology:

...you can't sit down and talk to someone for five or ten minutes or teach them how to get an email. [...] the fact that we're sole operating, we can do those quick and dirty little queries, but we can't do anything more in-depth.

Physical Challenges and Scheduling

All participants mentioned physical challenges. When replacing older mobile library

1 vehicles, there is now generally a preference for smaller vehicles that do not require
2 drivers to have a heavy transport license, but this can be a limiting factor when offering
3 access to digital technologies or skill-based programming as one participant observed:
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6 ...see our van [is] pretty small already, and [...] there's not really a lot of space
7 on it for a desk or a computer for someone to sit down and do their stuff.
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10 One interviewee reported that a reliance on batteries to run digital equipment could also
11 be challenging and was a factor when deciding whether to continue providing access to
12 a computer, printer and photocopier on a new mobile library.
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15 Challenges of scheduling were also identified, with one participant indicating
16 that low uptake of free Wi-Fi may be related to a schedule made up of short stops. This
17 interviewee continued by discussing the implementation of new schedules in which
18 longer stops allowed patrons more time to access digital services. Similarly, four
19 interviewees acknowledged that in order to provide DIS, longer periods of time spent in
20 the community were required.
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37 *The Impact of COVID-19*

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41 All interviewees identified challenges related to Covid-19. One participant had only
42 recently begun to provide DIS. Their second 'pop-up' library was due to take place
43 when a national lockdown began and was unable to proceed. This interviewee also
44 mentioned that lockdowns had prevented coding workshops and a regular robotics
45 group from taking place. Another interviewee noted that older patrons who did not have
46 access to the internet, or the skills to access digital materials, were especially excluded
47 throughout Covid-19 lockdowns. The participant observed an increasing interest in e-
48 books from older patrons, and related this to the potential benefit of higher digital
49 engagement:
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1 ...they had no books for like three months, [...] it was just ripped out from
2 under them, and that's why it would be good if they did have more ability.
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7 One participant had been involved in an outreach survey conducted during a
8 Covid-19 lockdown and reported expressions of vulnerability felt by residents of non-
9 urban communities. Respondents to the survey expressed a desire for internet training
10 and assistance with tasks such as internet banking. Despite the challenges brought by
11 the pandemic, two participants noted that the nationwide lockdowns had provided a
12 valuable opportunity for them to take stock and to invest time in the planning and
13 strategy of mobile library services.
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25 *Finance and Performance Measurement*

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27 Three participants commented on challenges of a financial nature. One interviewee was
28 awaiting funding for the purchase of a new mobile library, and until then was delivering
29 mobile library services and DIS from a domestic vehicle. Low uptake of DIS also
30 contributed to challenges in accessing funding, as one participant discussed:
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39 We got Wi-Fi on the buses two and a half years ago and that was quite a big
40 struggle to get the acceptance of funding for it really, [...] because it's not used
41 much.
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47 This highlights the challenges related to the measurability of DIS but it was mentioned
48 explicitly by only one participant. The interviewee planned to implement more DIS but
49 expressed concern that the success of these could not be captured by traditional,
50 circulation-based measures.
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Benefits of Providing DIS on Mobile Libraries

Participants also reported benefits to their library service in providing DIS. On one mobile library where patron use of Wi-Fi was very low, the mobile librarian noted that this access was still beneficial to staff when familiarizing patrons with the library's digital interfaces. Where free internet access was provided through APNK, the participant reported benefits of cost and security to the library:

...so the fact we can add that into our annual subscription and they do the back end and stuff, rather than us having to set up a kind of independent. [...] It's also safe, you know [...] it's running through the DIA National Library security systems...

One interviewee commented that, as their smaller mobile library carried fewer print books, the importance of supporting patrons to access digital resources grew. This support then facilitated a rise in e-book readership. Greater patron familiarity and use of digital library resources may also free up staff time, and assist mobile librarians who wished to implement less-regular, and more responsive scheduling:

Having the digital library is a really key part of our strategy around lending. If we can encourage our customers to use the digital library, which is open 24/7, then we might not need to go every four weeks.

Discussion

Many digital inclusion services offered by mobile libraries in non-urban areas of Aotearoa New Zealand appear to target first-level inclusion related to access, supporting research that shows that even when the internet is widely available (as it is in Aotearoa New Zealand), first-level digital exclusion may persist in the form of access to devices,

1 or expenses related to the maintenance of hardware, software, and subscriptions (Van
2 Deursen & Van Dijk, 2019). However, many interviewees reported that although they
3 offered access to the internet and digital technologies, patron use remained low. It is
4 unclear whether this was because patrons were already digitally included, or due to a
5 lack of skills, motivation or trust. If the first of these, this calls into question one of the
6 primary assumptions made in this study, that those living in non-urban communities are
7 at risk of digital exclusion, and is an area that requires further investigation.
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17 Participants also offered DIS related to second-level, skill-based inclusion, and
18 most interviewees reported a desire or need among their patrons for assistance in this
19 area. These findings are in keeping with the notion that access to technology does not
20 automatically provide the user with all the associated benefits (Scheerder et al., 2017),
21 and that the key to taking full advantage of the RBI in Aotearoa New Zealand is now
22 associated with effective use of the internet, rather than just access alone (RBUS, 2018).
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32 Third-level inclusion associated with motivation and trust was mentioned far
33 less frequently by participants, and DIS targeting these aspects appeared to be minimal.
34 One interviewee, however, seemed to be very aware of the issue of motivation, and their
35 comments indicated a conscious effort to increase their patrons' motivation to utilise the
36 DIS provided. The Digital Inclusion Blueprint describes trust as a person's level of trust
37 in the internet and online services, and their ability to use the internet and "avoid scams,
38 harmful communication and misleading information" (DIA, 2019a, p.10). In this
39 research project, statements from participants regarding trust were limited, and was
40 predominantly discussed in terms of the trust patrons had in libraries and their staff.
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51 Although the theme of trust is not discussed here in the same context as that understood
52 in the digital inclusion strategy, comments regarding trust indicated that, in general,
53 patrons trusted mobile librarians. Human intermediaries fulfil a critical role in brokering
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1 the interaction between people and information to create digitally included communities
2 (Mervyn et al., 2014), and it is worth noting that participants who discussed the role of
3 motivation and trust when delivering DIS, also reported issues of low patron use less
4 frequently. Although only anecdotal, it would be of benefit to collect more information
5 about the relationship between these factors.
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11 By offering DIS, participating mobile libraries support digital inclusion in their
12 non-urban communities, and research has suggested that where there is low connectivity
13 and a lack of skilled professionals, DIS offered by public libraries are particularly
14 important (Strover et al., 2020; Thiele, 2016). This is especially evident in participant
15 comments regarding the vital nature of DIS offered to remote schools who face issues
16 of low connectivity and a lack of staff with digital skills. Suggestions that access to the
17 Internet and digital technology (Bishop et al., 2016) through non-urban libraries
18 supports the economic development of surrounding communities also ring true
19 alongside participants' reports of the use of DIS for community funding and job
20 applications.
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36 While literature related to the challenges faced by mobile libraries when
37 delivering DIS is limited, static non-urban libraries have been found to experience
38 persistent problems with low staffing levels, a reliance on limited local funding (Real et
39 al., 2014) and poor telecommunications infrastructure (Thiele, 2016; Bishop et al.,
40 2016; Mehra et al., 2020). Real and Rose (2017) also identified that small, aging
41 buildings, limited staff funding, and a lack of mechanisms for collaboration make it
42 difficult for non-urban libraries to keep up with changes in the field by offering digital
43 services. Some challenges reported in this study align with those identified in previous
44 work in this area. Interviewees discussed low staffing levels in the form of difficulties
45 finding drivers for mobile libraries, especially when a heavy transport license was
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required, and challenges associated with small and aging buildings may also have similarities with those of aging, or smaller mobile library vehicles. Overall however, it appears that due to their intrinsically mobile nature, many of the challenges faced by mobile libraries are unique. These findings highlight a gap in existing literature and an opportunity for further research.

Conclusion

This study aimed to begin closing a gap in available literature by investigating how mobile libraries contribute to digital inclusion in non-urban communities of Aotearoa New Zealand. Analysis of interview data revealed findings which indicate that mobile libraries contribute positively to digital inclusion in a wide variety of ways and have the potential to fulfil an important role in promoting digital inclusion in the non-urban communities they serve. The topic of digital inclusion is multi-faceted and complex, and this research project identified, and touched lightly on a large number of important issues. As there is minimal research related to mobile libraries in these areas, many of the issues would benefit from in-depth investigation in their own right. Specifically, by focusing only on the perspective of mobile librarians, this study does not capture the experiences of mobile library patrons, or intentional non-users of mobile library services. Future research which investigates DIS from a patron perspective would be of value. Despite these limitations, the qualitative data captured in this research project begins to build a rich picture of how mobile libraries contribute to digital inclusion in non-urban areas of Aotearoa New Zealand.

Limitations

As noted in the Methodology section, the study was exploratory and, due to time

constraints and participant responses, the number of participants was limited to only six staff from five libraries. This small sample size does not allow for generalized conclusions to be drawn on the topic and, given the exploratory nature of this research, the results should be viewed as preliminary evidence that warrants further investigation. It is highly unlikely that saturation (Glaser & Strauss, 1999) was achieved and this was not the aim of this exploratory work, but the richness of the dialogue generated through the interviews provide interesting avenues for future research in the area.

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