Current State of Broadband Usage of Rural Communities in New Zealand

Final Report

By

Rural Broadband Usage Survey (RBUS) Project Team

School of Engineering, Computer and Mathematical Sciences
Auckland University of Technology
Auckland, New Zealand

August 2018

RBUS Project Team

Academic Staff Members:

- Dr William Liu
- Professor Edmund M-K Lai
- Associate Professor Jairo A. Gutierrez
- Dr Simon Xiang

Student Members:

- Rory Knight
- Louie Faundo
- Chung But
- Keli Liu
- Khodesh Temita

EXECUTIVE SUMMARY

A statistical survey of rural residents in New Zealand's North Island in relation to their current level of broadband access and use was conducted. The goal of this survey is to understand how rural residents and their communities are making use of the improved Internet connections through the Government's Rural Broadband Initiative (RBI). In addition, the drivers of Internet use that characterizes the importance of the Internet to rural residents are explored. The survey data collection was conducted between February and July 2018, and it had been undertaken from a down-to-earth, grassroots perspective with face-to-face meetings with people living in rural areas. A total of 226 respondents had participated in this survey.

The results of this rural broadband usage survey (RBUS) indicate that about 50% of the respondents are satisfied with the speed and the reliability of their Internet connections offered by RBI stage I. However, around 28% of the respondents are still dissatisfied with the Internet speed and connection reliability. The majority of the Internet usage involves searching for basic information and news, online entertainment and banking. There is still a high proportion of respondents who are unsure how else the Internet can help them in their day-to-day activities, e.g., using cloud technology capabilities and online marketing. A summary of the survey results is as follows.

- Most of the respondents use their mobile phones (90.28%) and their laptops (70.83%) to access the Internet.
- Portable devices are most commonly used by those accessing the Internet at home. The top 3 devices are a mobile phone (93.06%), laptop (75.00%), and tablet (49.07%). For those accessing the Internet at locations other than their homes, about 22.22% of the respondents use a desktop.
- The largest group (38.43%) of the respondents spend 3 to 5 hours daily on the Internet, and the second largest group (20.83%) spend over 8 hours daily. The respondents who are a younger tend to spend more hours on the Internet. The group spending over 8 hours daily can be broken down by age into 16-29 (39.13%), 30-44 (20.37%), 45-59 (16.92%), and 60-69 (11.11%), with none 70 or above. This trend is similar for the 6-7 hour range. In the 3-5 hour range, 30-44 and 45-59 age groups are the main contributors (61.45%) while for the 1-2 hour range, 45-59 and 60-69 constitute the biggest groups (71.79%). Finally, the 70+ age group is the main contributor to the less than 1-hour range (36.36%).
- The online shopping (4.15% daily and 17.05% weekly) is double of the online selling activities, the top percentage on selling is at less than once a month rate (39.25%), and online shopping is at a monthly rate (35.48%). This can imply the majority of the respondents are not using the Internet for business purpose.
- 70.83% of the respondents have never received any form of instructional or educational lessons on how to use the Internet properly. For those respondents who have had lessons, 35.94% of respondents are received them from their knowledgeable family members/friend, and 29.69% are

self-taught at home. Moreover, when asking these respondents if they are interested in learning more ways to make better use of the Internet, the majority answers are neutral (40.63%), which implies that they are not sure what additional benefits they can get from having these instructions.

- In relation to daily Internet usage, the majority use the Internet to check email (85.24%), read the news (67.59%), search for information (62.04%), surf the web (71.96%); visit social networking websites (61.86%), and instant messaging (63.55%). Entertainment-related Internet usage includes watching TV (36.41%), viewing images (29.30%), listening to music online (27.44%), and looking up funny contents (24.88%). However, very few use the Internet for business and other work-related matters such as selling online - only 2.8% daily and 8.88% weekly. Travel booking is about 4.17% daily, and comparing the prices of products or services online is about 10.08%.
- 34.56% of the respondents do not use Cloud services. Among these respondents, 41.33% do not know how to use the Cloud, and 32% are unsure how Cloud technology can be useful in their everyday life.
- For those respondents using Cloud services, 75.45% use essential online Cloud storage. 50.91% have been using file sharing. However, only 31.82% using Cloud services (Cloud Applications) that is more complicated and designed for business purposes. In this group, 85.71% are employed, and the remainder is students.

These findings could serve as a reference to inform those who wish to create, invest and take actions to speed the economic and social growth of rural communities in New Zealand through Internet connectivity, moving from volume to a more value-added rural economy.

ACKNOWLEDGMENTS

This research is the result of a New Zealand team effort, starting from a seed planted by an InternetNZ's research grant, with the nourishing and watering through meeting the various and diverse rural communities, and finally, the fruits i.e., the final report (the key findings) harvested by the Rural Broadband Usage Survey (RBUS) team, at the School of Engineering, Computer and Mathematical Sciences in AUT.

We thank all the survey participants who have contributed to the valuable contents of this report. We would like to thank Gertrud Kikajon from InternetNZ for her coordination and instant support for this research project. We would like to thank our University Research Office's Julia McPhee who helped us coordinating with InternetNZ. We would also like to thanks our school managers Terry Brydon and Saide Lo who always supported us on the financial management and administration of this grant. Moreover, the community we met at InternetNZ's NetHui 2017 has been a marvelous fountain source of knowledge and experience on the rural subject, is supporting and inspiring us to move the project forward. On the other hand, internationally, we would like to thank Dr. Arjuna Sathiaseelan, the previous Founding Chair of IRTF Global Access to the Internet for All (GAIA) research group and the Director of Networking for Development (N4D Lab) at the Computer Laboratory, University of Cambridge. Currently, he is the CEO of the Ammbr Research Labs (part of the AmmbrTech group). Dr Sathiaseelan had much input in the very early stage of discussions and preparations of the project proposal.

Last but the most important, we would like to acknowledge our sincere thanks to InternetNZ – without this seeding grant, we will not have the chance to outreach out to our rural communities and understand their needs in Internet communication.

Table of Contents

Figures

Tables

CHAPTER I: INTRODUCTION

Research Project Overview

This research aims to gain a greater insight into how rural residents and their communities in New Zealand are utilizing the improved Internet's connection speeds provided through the Rural Broadband Initiative (RBI). The key objectives are to capture how the rural residents of New Zealand use the Internet and to identify the factors that may hinder them from fully utilizing the improved Internet connections provided by the RBI.

Stage I of New Zealand Government's Rural Broadband Initiative has been completed. This means that 90% of rural households having a decent 5Mbps broadband connection and schools have access to fiber broadband. The RBI could make a significant change in lifestyle and wellbeing of the rural residents. This research project attempts to reveal how rural residents and their communities are making use of these improved Internet connections in their day-to-day activities.

Research Objectives

The major objectives of this research are:

- To understand the current status of how rural New Zealander's use their internet
- To find out what our rural residents want to improve with the current Internet connection that they have
- To provide the ways on how to use the Internet better and/or best practices so that our rural residents can maximize the use of the Internet to betterment their daily lives
- To disseminate the findings to appropriate stakeholders that may help improve the technology or the way rural residents use the internet

Using the survey, we have captured the following:

- How often the Internet is actively used by the survey participants
- The devices that are used as well as the devices owned by the survey participants
- The Internet service provider and the Internet connection that survey participants have
- How important the participants find the Internet as well as how they rate themselves on their ability to use the Internet.
- Activities and how frequent they do the activities using the Internet
- The satisfaction and the reliability of the Internet connectivity perceived by the participants

We also want to conduct an analysis depending on the diversity of the Internet users, therefore the following information is also captured:

- Gender: Male, female or gender diverse
- Ethnicity: the major ethnicities in New Zealand according to the NZ Census are Maori, Pacific people, Asian, European, Middle Eastern, Latin American, African and other ethnicities.
- Region: the regions in the North Island that are covered by RBI Stage I – Northland, Auckland, Waikato, Bay of Plenty, Gisborne, Taranaki, Manawatu-Wanganui, Hawkes Bay and Wellington
- Employment Status: Employed, unemployed, student, retired, home-maker or unable to work
- The industry that the participants work in.

Research Outcomes

Our goal is to gain a greater insight into how rural residents and their communities in New Zealand are utilizing the improved Internet connection speeds. The opportunities provided by this insight will be the identification of barriers such as knowledge gaps from which best rural usage practices can be recommended. The practices and information provided by our project could be used by education and business services to target appropriate training and other products for particular rural groups or organizations.

The survey findings are provided in Chapter IV in the form of graphs. The results can help Internet NZ and the rural communities have a greater understanding of their current connectivity as well as being aware of the potential benefits of the faster Internet connections and better infrastructures.

Potential Benefits

Internet NZ, the New Zealand Government, and other potential stakeholders can use the findings from this research to create, invest and take actions to speed the economic and social growth of rural communities through Internet connectivity, moving from volume to a more value-added rural economy

The findings from this research can be used by the rural residents as a point of reference on how they are using the Internet and learn how they can use the Internet better to improve their way of living.

The remaining parts of this report are organized as follows. Chapter II briefs the background and motivations of this rural broadband usage survey project. The research methodology has been discussed in Chapter III. Chapter IV presents the survey results and the statistical analysis. The key survey findings are concluded in Chapter V.

CHAPTER II: BACKGROUND

New Zealand's landscape is changing. Rural areas are now being provided with access to faster broadband connections, putting them on par with urban areas and allowing increased productivity due to maximizing usage and understanding. With the Stage I of New Zealand Government's Rural Broadband Initiative (RBI) now completed, 90% of rural households have at least 5Mbps broadband connection (MBIE, 2016). At the same time, a very high percentage of rural schools have access to fiber broadband. This development can significantly change the lifestyle of these communities and enable them to attract 50,000 more young people into the primary sector over the next 10 years, which is the government's target. Furthermore, productivity gains in the primary sector and business development could be realized through better use of technology of which Internet connections are vital.

The problem in fulfilling the potential gains through RBI seems to be the effective use of broadband. According to Network for Learning, New Zealand schools' managed network provider, most teachers still feel that they are not equipped to maximize the education opportunities provided through fast broadband (The Download, 2016, p.13). Farm enterprise specialists in KPMG Consulting report that most farmers are reluctant to change practices they have used for the last 20 years (The Download, 2016, p.14) There are loads champing at the bit to get Internet speeds that will allow them to innovate while their counterparts in Europe are already using smart, online tools for everything from managing their accounts and budgets to measuring the yields of their herds (The Download, 2016, p.13).

Current research is required to determine the level of usage, proficiency, and productivity achieved now that stage 1 of RBI has been implemented. With the promises of stages 2 and 3, further research will be able to assess these levels to a greater degree and provide more insight into broadband usage in rural areas of New Zealand.

This survey was mainly focused on usage behaviour among rural residents and their communities. The main intent is to determine who accessed the Internet, via what medium, and if they felt it helped or hindered their lives as a whole. It did not concentrate on what particular items they were accessing, as each respondent is individual, and this varies over time in any case. While these activities related questions were included in the survey, they were broad in context and appear only to determine the general type of Internet usage.

The level of usage based on accessibility was the main reason for the study. There is no point in having the best broadband available if the people do not/will not use it. The utilization of the Internet in this sense is discussed in this study.

Related Studies

World Internet Project New Zealand
Previous indicators of satisfaction levels among rural broadband users were measured in the 2015 World Internet Project New Zealand survey. These results found that rural users on average are less satisfied with both the reliability and speed of their service (Crothers et al., 2016).

Later studies broadened the survey material to include questions relating to the credibility of information online, reflecting the attitudes of global affairs in regards to the 'Fake News' phenomena. The 2017 World Internet Project New Zealand, published in 2018 addressed similar topics as this survey such as reliability on the Internet. "80 percent of participants felt that at least half of the information they found on the internet was reliable appears extremely high" (Díaz Andrade, A. 2018).

Our study showed that only 52.14% trusted online contents. That indicates a level of distrust in the online community. This indicates changing views over time. Respondents do not appear to trust the information as they initially did. This is likely a reflection of the recent politicization of 'Fake News' and decreased trust of online sources.

Auckland Rural Broadband Survey 2016

The Auckland Rural Broadband Survey (ARBS) 2016 was another study which examined the usage and views of rural Internet users, although the sampled area was geographically restricted to just the fringes of the Auckland region. Findings of this survey, which received 991 responses, noted that the main Internet activities in rural Auckland were news and information, followed by work (87% and 80% of respondents respectively). Most participants (81%) also reported they felt their Internet connections were inadequate, with "almost half of the respondents experiencing a very slow Internet connection and frequent dropouts when connected" (Rohani et al. 2016).

The ARBS was an influence on the current study, as their observations were instrumental in the research this project desired to see. Therefore, we expanded the study on a larger scale with a scope greater than just the Auckland region. This study attempts to encompass the North Island of New Zealand; areas such as Northland, Auckland, Waikato, Bay of Plenty, Gisborne, Taranaki, Manawatu-Wanganui, Hawkes Bay and Wellington.

NetHui 2017

NetHui is an annual community event supported by InternetNZ which began in 2011. It hosts a variety of informative events, talks, labs and sessions centered around New Zealand's Internet. Each year pertains to a certain theme for discussion, with 2017 being 'Trust and Freedom'. Centred under this was a multitude of discussions related to rural Internet usage such as Maori Digital Futures, Identifying and Bridging Digital Divides, Digital Inclusion & Literacy as well as Rural Connectivity (NetHui, 2017).

Moreover, the considerations and discussions of topics such as identifying and bridging digital divides, digital inclusion (Elkhatib, 2015) and rural connectivity (Villapol et al. 2017) were instrumental in inspiring this research in regard to rural Internet users. Recurrent points of discussion such as the 'digital divides' that are present in different regional and socio-economic groups of the population became apparent when discussing Internet technology access and utilization.

Information from the NetHui was valuable in deciding areas to include in our survey. All areas deserve equal access regardless of their socio-economic status.

CHAPTER III: METHODOLOGY

We conducted this rural broadband usage survey (RBUS) research project based on the 5 stages of a survey (Blair, 2013) including (1) RBUS design and operation planning, (2) RBUS pilot testing, (3) RBUS final survey design and planning, (4) RBUS data collection, and (5) RBUS Data Analysis and Final Report stage as shown in Figure 1 below.

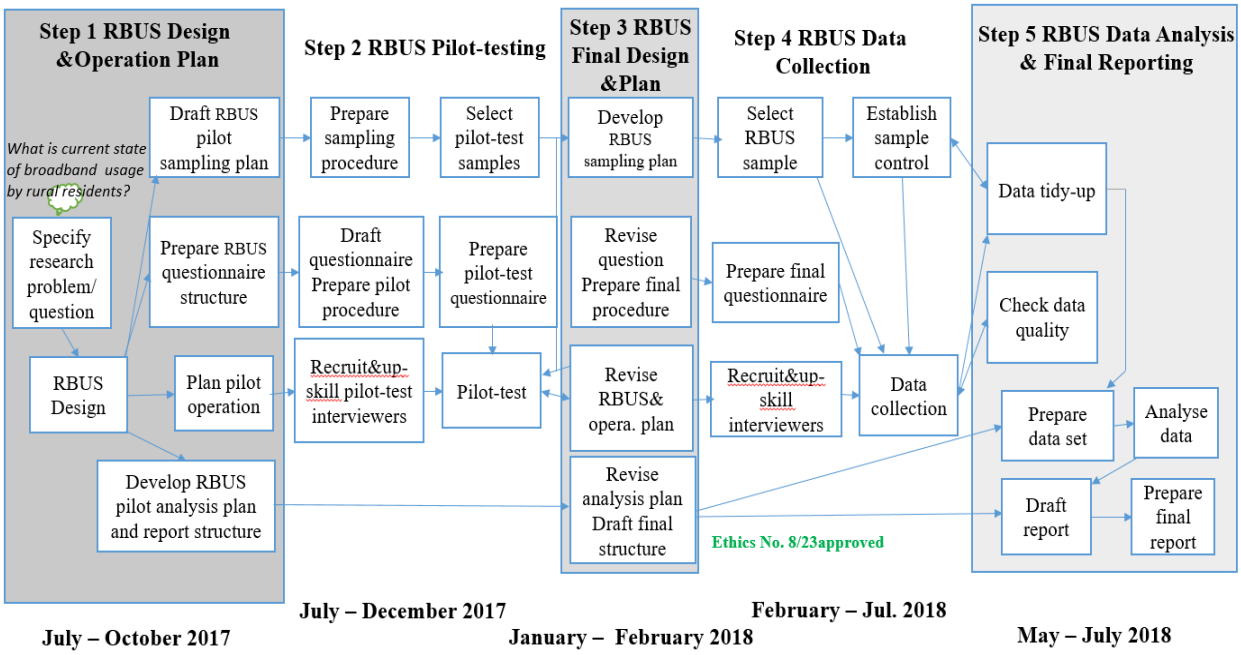


Figure 1 - Rural broadband usage survey (RBUS) process and timeline

RBUS Design and Operation Planning

This first stage is to define a research question/problem and preliminary plans.

Research Question

As stated in the first chapter, this survey objective is to understand the current level of Internet access and usage by the rural residents. Therefore the main research question is:

"What is the current stage of rural residents making use of improved Internet connections through RBI ?"

One of the potential solutions to answer the above question is to develop a tool (which can be either hardware or software) to monitor the Internet daily usage of rural residents, based on the assumption that the tool can accurately provide an observation report gathered from most of the Internet usage by the rural residents. However, this solution is expensive and also requires a great amount of time for

development, deployment, and assessment. Moreover, potential participants may not accept it because there are information security and privacy concerns to be addressed. With limited time and budget, we aimed at understanding rural residents' Internet broadband use. Hence, we considered a statistical survey as a research tool that could address the research question as well.

Preliminary Operational Plan

In the first stage, we listed major tasks to be conducted from the beginning to the end of the project as follows:

1. Rural broadband usage review
    - To review possible rural broadband usage from the literature
    - To scope the rural broadband usage that is to be studied in the survey
    - To develop and submit an ethics application to the Auckland University of Technology Ethics Committee (AUTEC)
2. Preparation of survey questions
    - To design and refine survey questions
    - Cross-checking the survey questions
    - To get feedback from this survey via some participants met in InternetNZ's NetHui (between 9th – 10th September 2017)
3. Sample selection
    - To determine survey participants/sample
4. Survey data collection
    - To collect data via a face-to-face survey service (once ethics approval has been received), for ensuring the participant is a rural resident
5. Survey data analysis
    - To analyse the collected survey data
6. Reporting the survey findings
    - To report the survey findings in the form of a report
    - To analyze and identify the knowledge gaps

Preliminary Timeline Plan

The project was initially planned to conduct between 1 of July 2017 and 1 of July 2018.

Preliminary Sampling Plan

Originally, when this research was first proposed to InternetNZ, the rural area coverage of this survey was crossing whole New Zealand. Later, after consulting with InternetNZ and also considering the limited budget and time, we adjusted the scope of area coverage to North Island only. In conclusion, a respondent who is eligible for this survey must meet the characteristic of being a resident living in the

following rural areas identified by the RBI Phase I report (MBIE, 2016).

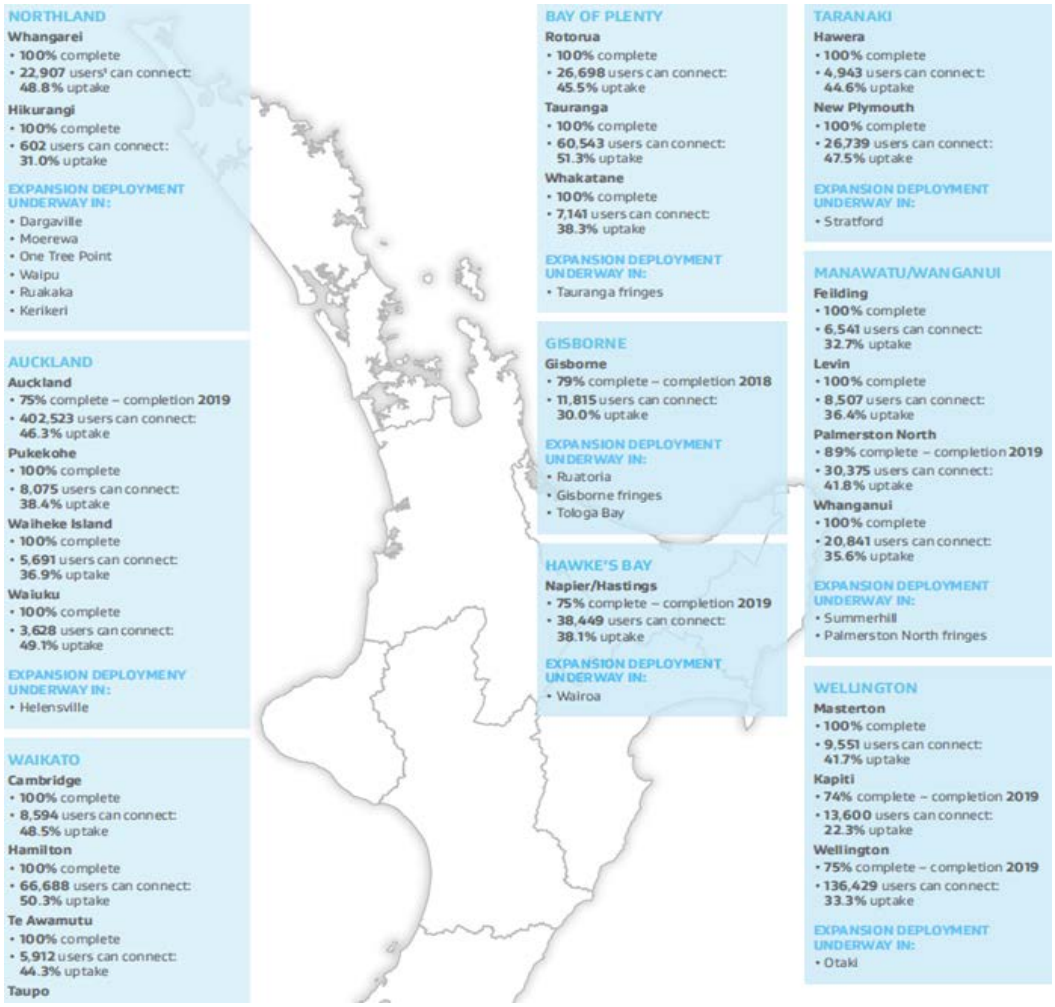


Figure 2 – RBUS region selection in North Island

- Northland - Whangarei
- Auckland - Auckland, Pukekohe, Waiheke Island and Waiuku
- Waikato - Cambridge, Hamilton, Taupo, Te Awamutu and Tokoroa
- Bay of Plenty - Rotorua, Tauranga, and Whakatane
- Gisborne - Gisborne city
- Hawke's Bay - Napier and Hastings
- Taranaki - Hawera and New Plymouth
- Manawatu/ Wanganui - Feilding, Levin, Palmerston North and Whanganui
- Wellington - Wellington, Kapiti, and Masterton

Budget Plan

The total amount of funding proposed is $15,000 for research assistants, survey design, conduction and results in analysis and travel subsistence costs. The funds ($15,000) from InternetNZ had been planned and spent on the core research activities as follows:

- Research assistants ($ 6500)
    - NetHui conference and Qualtrics survey tool up-skills training
    - AUT Polo shirts and survey promotion materials
    - Data analysis and final report written-up

- Survey costs ($ 8500)
    - Design and pilot-testing
    - Transportation, accommodations and a daily allowance for data collection in fields
    - Car rental and petrol consumption
    - Incentives (drinks, gift cards) to boom the face-to-face survey response rate

Ethics Approval Preparation

An ethics approval was planned to be developed and submitted to the Auckland University of Technology Ethics Committee (AUTEC) in the format required by the Auckland University of Technology.

The AUTEC require the researchers to provide the following items:

1. Application for Ethics Approval (EA1 form)
2. Participant information sheet to be declared to the survey respondents
3. Questionnaire planned to be used in this research

The ethics approval result is presented in Appendix A – Ethics Approval.

Preliminary Analysis and Reporting Plan

In the first stage, we planned to use Qualtrics (licensed to AUT) to create an online questionnaire to the respondents which they can fill through the iPads carried by the data collectors. Qualtrics provides analysis functions such as graph/chart generation, survey results search and filtering, and reporting functions. We planned to report findings from analyzing the survey results and details of this research project in a form of document (i.e. this final report).

RBUS Questionnaire and Pretesting

Designing Questions

Since the major objective of this survey is to capture the broadband usage of the rural residents in their daily life, we designed a questionnaire to uncover their daily usage. To successfully engage participants in this survey as many as possible, we tried to avoid using many questions or choices and the questions are mainly classified into 5 groups (G1 – G5) as follows:

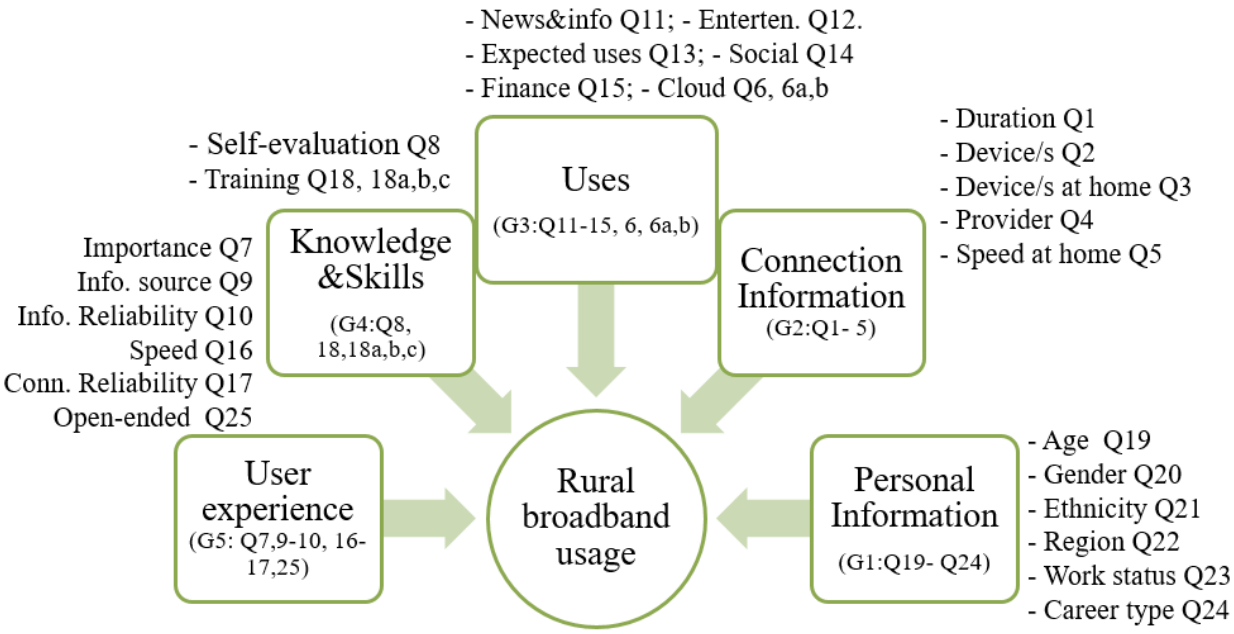


Figure 3 Questionnaire structure and sensitive factors

1. Questions about respondents' basic information (shortly called G1)
    - To record the residents' basic information (e.g. age group, geographical areas where they are residing, gender etc.) which could be used for statistical inference
    - To reveal possible patterned activities and usage types that the residents usually use the Internet for
2. Questions about Internet connection information (G2)
    - To check the Internet connectivity related information such as Internet provider, the devices used to access the Internet
3. Questions about the Internet usages (G3)
    - To understand what they use the Internet for and the type of contents accessed
4. Questions about the user's knowledge and skills (G4)
    - To check if the respondents have the proper knowledge and skills to use the Internet or not, do they have a need for the further training
5. Questions about user experience (G5)
    - To check if the respondents are satisfied with the improved broadband services by the government initiatives i.e., RBI

The total number of questions used in this survey is 30. A letter Q following a unique number abbreviates each question. For example, Q1 is the first question. The respondents were not expected to answer all the 30 questions. This survey provides an adaptive questionnaire. That is, an answer chosen by a respondent determines the next question. Hence, respondents may not see the same questions when participating in the survey. The 30 questions can be classified into question groups (G1-G5) as follows:

Note that the details of all the questions and their available choices are attached in Appendix B

- G1 – Questions about respondents' basic information
  - Q19: What is your age group?
  - Q20: What is your gender?
  - Q21: What is your ethnicity?
  - Q22: Which region do you live?
  - Q23: What is your current employment status?
  - Q24: Which of the following categories best describes the industry you primarily work in?

- G2 – Questions about Internet connection information
  - Q1: How often do you actively use the Internet?
  - Q2: Which devices have you used in the past from any location to connect to the Internet? (Please select all that applies)?
  - Q3: Which of the following devices do you have in your household? (Please select all that applies)
  - Q4: What Internet service provider are you currently with?
  - Q5: What Internet connection is your household using?

- G3 – Questions about the Internet usages
  - Q11: How often do you use the Internet for the following purpose?
  - Q12: How often do you use the Internet for the following purpose?
  - Q13: Which, if any, would you like to do more of on the Internet?
  - Q14: How often do you do the following?
  - Q15: How frequently do you use the following?
  - Q6: Do you use Cloud?
  - Q6a: What do you use the Cloud for?
  - Q6b: What is your reason for not using the Cloud

- G4 – Questions about the user's knowledge and skills
  - Q8: How would you rate your ability to use the Internet?
  - Q18: Have you ever received instructional or educational lessons on how to use the Internet?
  - Q18a: If yes, did you find the lessons useful?
  - Q18b: How interested are you in learning more ways to make better use of the Internet?
  - Q18c: Where/how did you get lessons on how to use the Internet?

- G5 – 5. Questions about user experience
  - Q7: How important is the Internet in your everyday life?
  - Q9: How important is each of the following as a source of information to you?

- Q10: In your own opinion, how reliable is the information on the Internet?
- Q16: How satisfied are you with the speed of the Internet at your home?
- Q17: How reliable is the Internet at your home?
- Q25: Any wishes, comments, complains or feedback regarding your Internet? (This is an open-ended question)

Pretesting

During designing the questionnaire, we pretested our questionnaire via two phases as follows:

1. Early Pretesting Phase – The objective in this phase is to quickly get feedback on a small set of questions from a small group of samples
2. Pilot Survey Phase – The objective in this phase is to test the questionnaire using a small group of pretesting samples.

RBUS Final Survey Design and Planning

Details of Survey Questions

As described above, the questionnaire had been improved several times during the pretesting phases. Finally, there are 30 questions in total. The survey respondents did not need to answer all the 30 questions. The next question will be adaptively chosen for a respondent based on the respondent's choice/choices given to the current question he/she is taking. The maximum number of questions to be answered by a respondent is 30, while the minimum number of questions to be answered by a respondent is 27.

The presentation of all the web pages is depicted in Appendix B - Presentation of Online Survey.

RBUS Data Collection

We conducted data collection mainly by visiting those identified rural areas to reach rural residents in the designated communities. We had invited the residents whenever we met them and ask help on filling the survey through the three iPads we carried. Some survey flyers were distributed containing the online survey link (URL) for respondents who wished to participate at a later stage. The survey data was monitored by using Qualtrics and data stored at Qualtrics database.

Analysis and Report

In the final stage, we worked on the survey data analysis, created the report showing survey findings, and wrote the final report. For the data analysis, we utilized the analysis functions available in Qualtrics to produce statistical information and visualized diagrams. The details of the survey findings are presented in Chapter IV: Survey Findings.

CHAPTER IV: SURVEY FINDINGS

This chapter presents the findings of an analysis conducted on the survey data recorded by Qualtrics. In this survey, the term of NZ rural Internet users is applied in reference to the qualified respondents. In addition, the terms of NZ rural Internet users and respondents are used interchangeably in this report. The findings are discussed in different sections as follows:

1. Respondents' Basic Information
2. Connection Information
3. Internet Usage
4. Internet User Experiences
5. Internet Knowledge and Skill

Respondents' Basic Information

There were 217 records in the survey. Moreover, not every respondent has completed all the survey questions. Therefore, the total count for survey questions will be varied.

Age Groups

The age groups can be classified as 16-29, 30-44, 45-59, 60-69, and 70+ year-old groups. Table 1 and Figure 3 present how the NZ Internet users are classified according to their ages. Most of the respondents' age is from the 45-59, 30-44, and 16-29 age groups, which are 30.09%, 5.46%, and 21.30% accordingly.

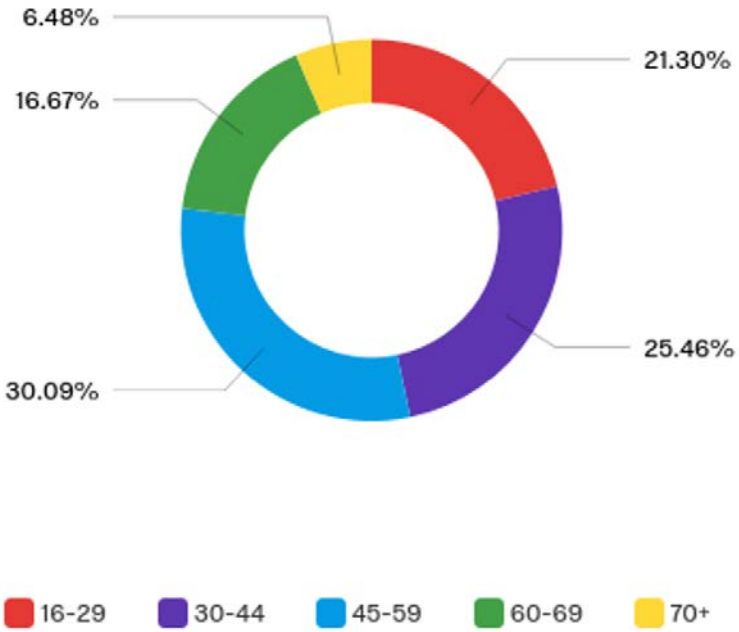


Figure 3 - The respondents' age groups

Table 1 - The respondents' age groups

Age group	Percentage	Count
16-29	21.30%	46
30-44	25.46%	55
45-59	30.09%	65

60-69	16.67%	36
70+	6.48%	14
Total	100%	216

Gender

Table 2 and Figure 4 show the respondents' gender distribution. The margin between male and female is insignificant, where 51.43% are male, and 47.62% are female.

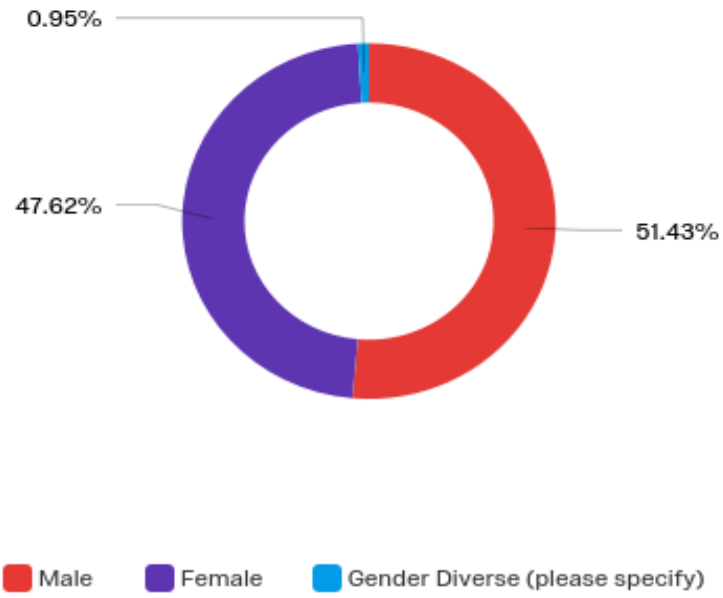


Figure 4 - The respondents' gender

Table 2 - The respondents' gender

Gender	Percentage	Count
Male	51.98%	108
Female	47.03%	100
Gender Diverse	0.99%	2
Total	100%	210

Regions

Table 3 and Figure 5 show the respondents' regions. The majorities of respondents are from Auckland (33.18%), Bay of Plenty (23.36%), and Waikato (15.42%). Due to the scope of the project, there are no respondents from the South Island.

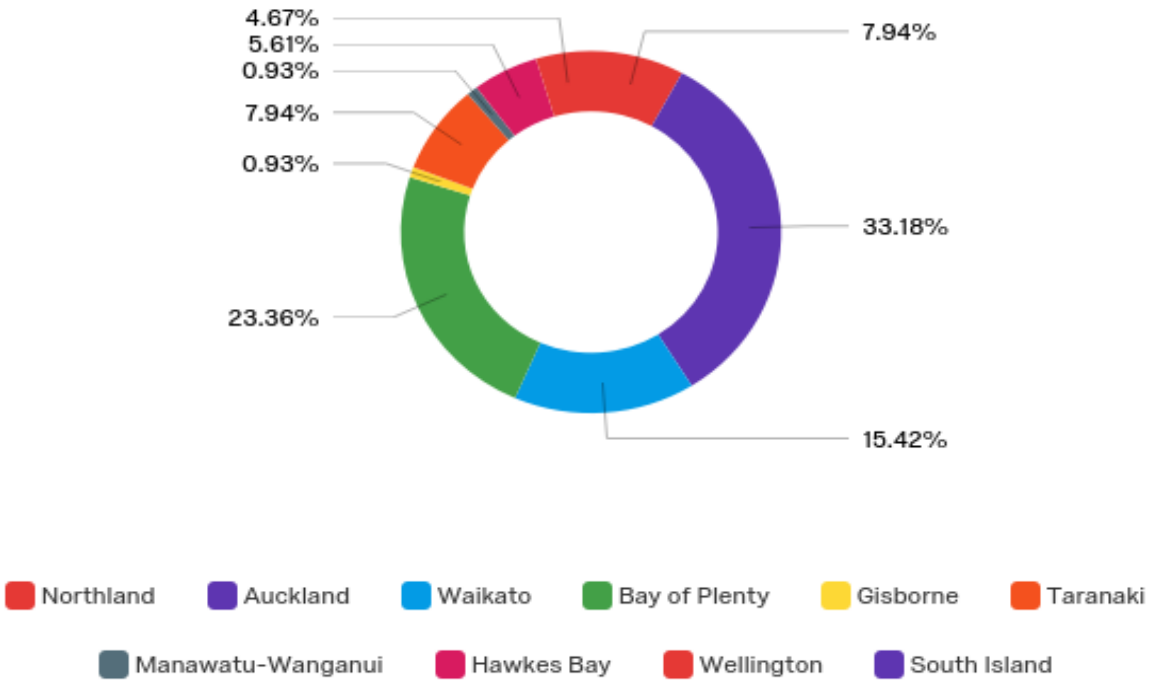


Figure 5 - The respondents' region

Table 3 - The respondents' regions

Region	Percentage	Count
Auckland	33.18%	71
Bay of Plenty	23.36%	50
Waikato	15.42%	33
Taranaki	7.94	17
Northland	7.94%	17
Hawkes Bay	5.61%	12
Wellington	4.67%	10
Gisborne	0.93%	2
Manawatu-Wanganui	0.93%	2
South Island	0.00%	0
Total	100%	214

Ethnicity

As shown in Table 4 and Figure 6, the majorities of respondents are European (58.41%). The remaining 14.95% are Asian, 8.41% are Maori, 6.07% are Pacific People, 2.34% are Middle Eastern. 0.93% of respondents are Latin American or African with the remaining respondents (7.94%) identifying as other backgrounds.

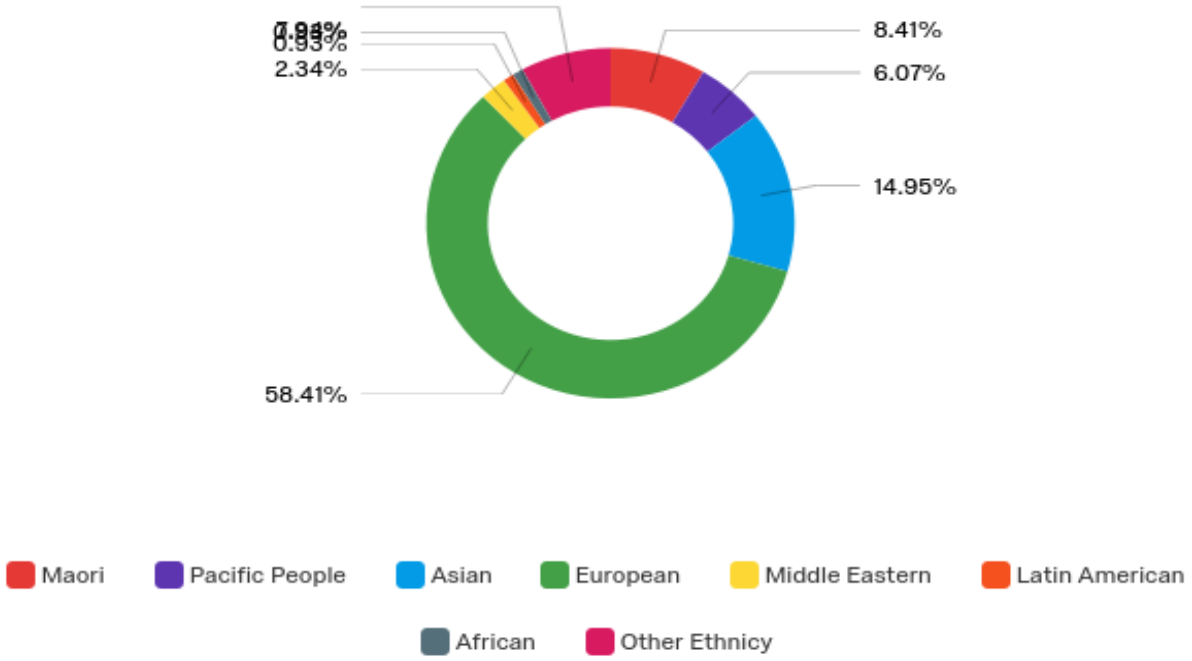


Figure 6 – The respondents' ethnicity

Table 4 - The respondents' ethnicity

Ethnicity	Percentage	Count
Maori	8.41%	18
Pacific People	6.07%	13
Asian	14.95%	32
European	58.41%	125
Middle Eastern	2.34%	5
Latin American	0.93%	2
African	0.93%	2
Other Ethnicity	7.94%	17
Total	100%	214

Employment Status

Table 5 and Figure 7 present the employment status of the respondents. Expectedly, the majority of the respondents are employed (70%). The second largest number is retired respondents (11.43%). The rest of the respondents are made up of students, home-maker, unemployed, and unable to work (7.14%, 6.19%, 3.81%, and 1.43% respectively).

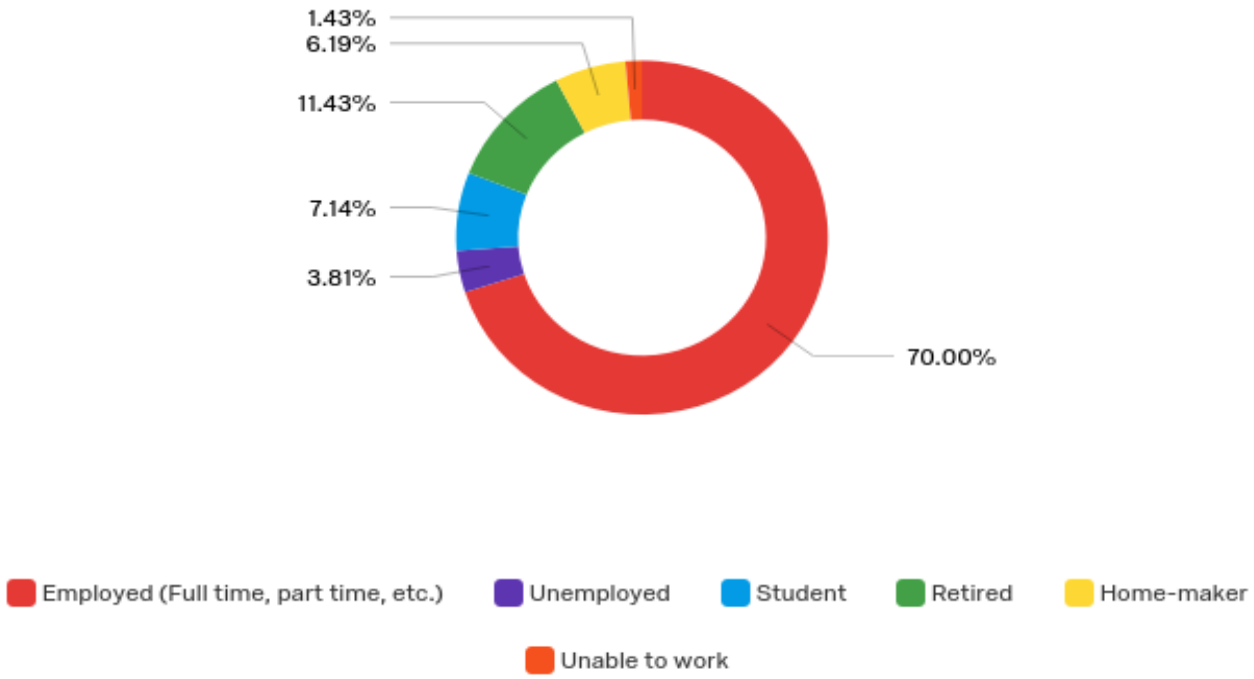


Figure 7 - The respondents' employment status

Table 5 – The respondents' employment status

Employment Status	Percentage	Count
Employed (Full time, part time, etc.)	70.00%	147
Unemployed	3.81%	8
Student	7.14%	15
Retired	11.43%	24
Home-maker	6.19%	13
Unable to work	1.43%	3
Total	100%	210

The results obtained from survey data in the industry identification question reveal the industries in which the employed respondents primarily work. Table 6 and Figure 8 show that the majority of employed respondents are working in four industries. They are Agriculture/Farming (13.61%), Hospitality & Tourism (10.88%), Education (10.20%), and Healthcare (7.48%). Unfortunately, there are no respondents in this survey who identified themselves as government/council employees or as part of general management.

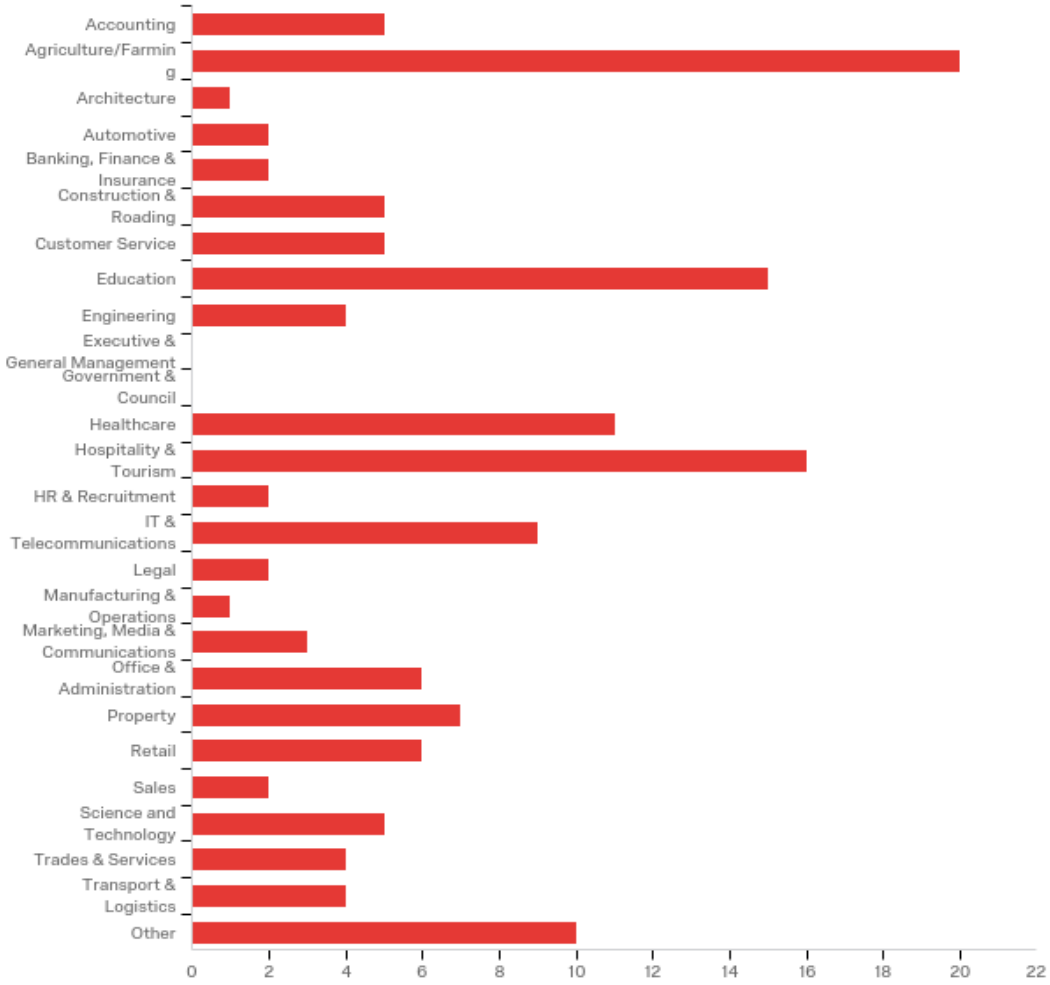


Figure 8 – The categories approximate the industries the respondents are employed

Table 6 – The categories of the industries the respondents are primarily employed

Industry Category	Percentage	Count
Accounting	3.40%	5
Agriculture/Farming	13.61%	20
Architecture	0.68%	1
Automotive	1.36%	2
Banking, Finance & Insurance	1.36%	2
Construction & Roading	3.40%	5
Customer Service	3.40%	5
Education	10.20	15
Engineering	2.72%	4
Executive & General Management	0.00%	0
Government & Council	0.00%	0
Healthcare	7.48%	11
Hospitality & Tourism	10.88%	16
HR & Recruitment	1.36%	2
IT & Telecommunication	6.12%	9
Legal	1.36%	2
Manufacturing & Operations	0.68%	1

Marketing, Media & Communication	2.04%	3
Office & Administration	4.08%	6
Property	4.76%	7
Retails	4.08%	6
Science and Technology	3.40%	5
Trades & Services	2.72%	4
Transport & Logistics	2.72%	4
Other	6.80%	10
Total	100%	147

Connection information

In this section, the state of respondents' Internet connections such as connections type, service provider and devices used will be presented to understand what the respondents are utilising.

Devices used to connect to the Internet

Based on the question, "which devices have you used to connect to the Internet in the past," Table 7 and Figure 9 show that most of the respondents (90.28%) used a mobile device to connect to the Internet. 70.83% of the respondent used a laptop, and 65.74% used a desktop computer. This finding shows that NZ Rural Internet users tend to use mobile devices more frequently. Moreover, most of the respondents used multiple devices to connect to the Internet in the past. Therefore, the sum of the counts for each device in Table 7 is more substantial than the number of total respondents (216).

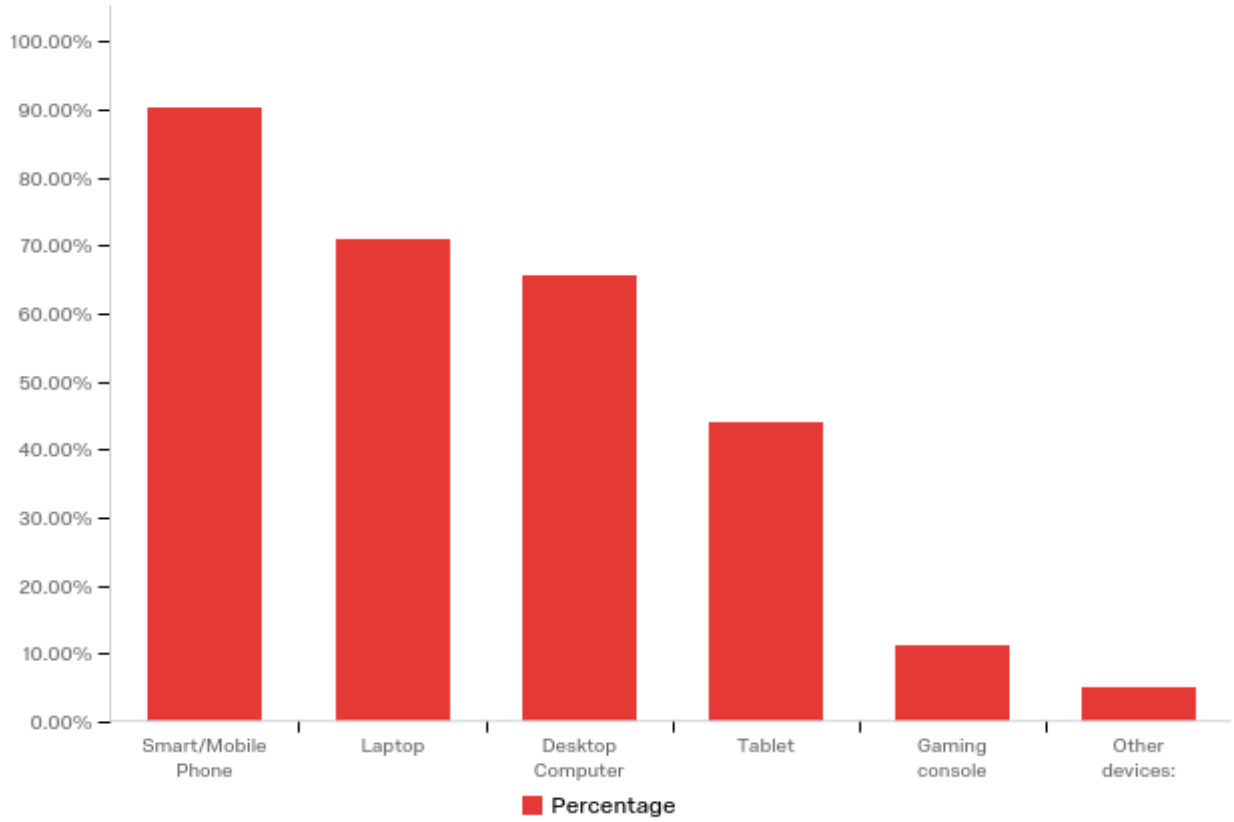


Figure 9 The devices used to connect to the Internet in the past

Table 7 - Devices used for the Internet in the past

Device	Percentage	Count
Desktop Computer	65.74%	142
Laptop	70.83%	153
Smart/Mobile Phone	90.28%	195
Tablet	43.98%	95
Gaming Console	11.11%	24
Other Devices	5.09%	11
Total	100%	216

The devices respondents have in the household

The results obtained from the survey data in question, "which devices you have in your house", are slightly different from the previous question. In the previous question, it only asks what devices the respondents used in the past to connect to the Internet. It does not focus on the ownership of the devices and the location. This question is more focused on these. It reveals the device's that respondents have at home for the Internet connection. According to the data in Table 8 and Figure 10, most respondents have a mobile/smartphone at home (93.06%). Compared to the data in the previous question; there are 6 respondents in the margin, which means there are 6 respondents who do not know or do not want to use a mobile phone to connect to the Internet. Moreover, the number of respondents who have a desktop computer at home is less than the respondents who have tablets at home. These results are opposite to the results from the last question. There is a difference of 48 respondents (22.22%) between the used desktop count and own a desktop count, which shows these respondents connected to the Internet somewhere else (e.g., library, workplace, cafe, etc.). Internet speed, reliability, affordability, etc may be a determining factor in this. In other devices, there are three different responses; they are smart TV, TV box, and kindle. Moreover, these results also imply that portable devices are more favored to be owned at home.

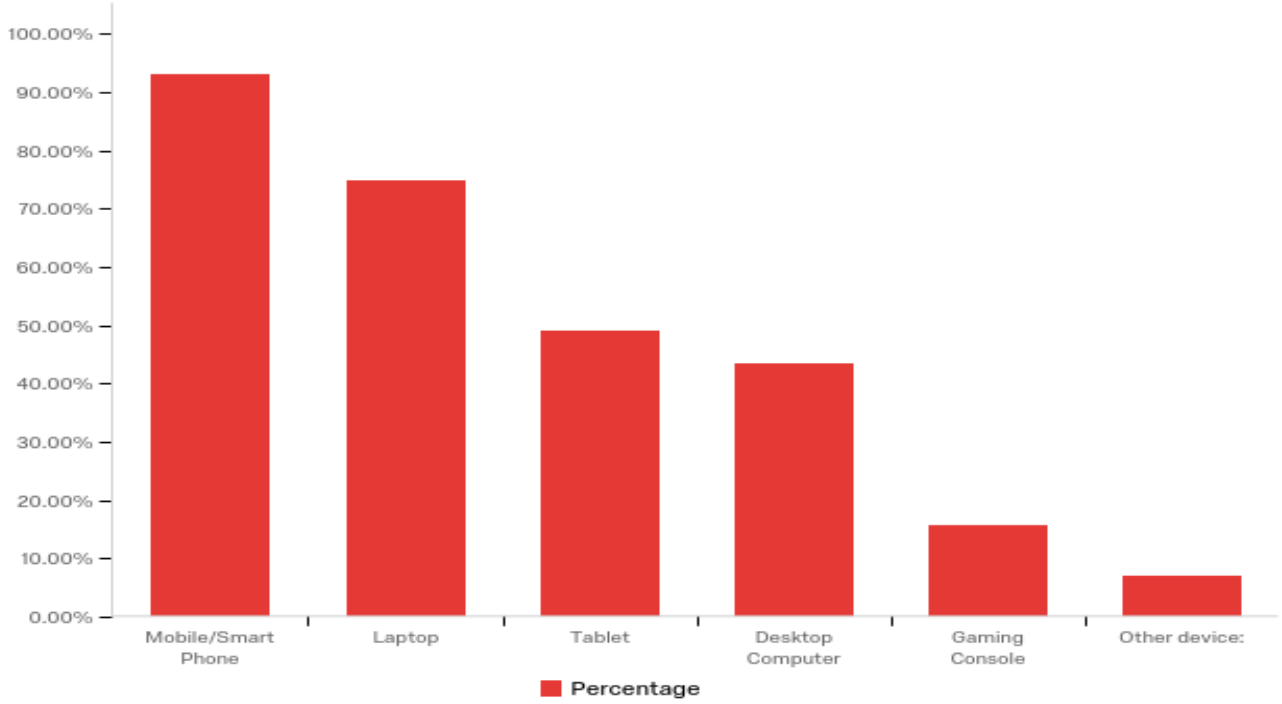


Figure 10 - The devices that the respondents have in their houses

Table 8 - The devices that the respondents have in their houses

Device	Percentage	Count
Desktop Computer	43.52%	94
Laptop	75.00%	162
Mobile/Smart Phone	93.06%	201
Tablet	49.07%	106
Gaming Console	15.74%	34
Other Devices	6.94%	15
Total	100%	209

Internet Connection Types

The results obtained from survey data in question “what internet connection you are using?”. It presents the connection type the respondents are using. There are 63.13% of respondents are using ADSL/VDSL broadband connection, 11.52% are using Fibre connection, 9.22% are using Rural Wireless broadband connection, and there 6.91% do not know what connection type they have. The details are displayed in Table 9 and Figure 11 in below.

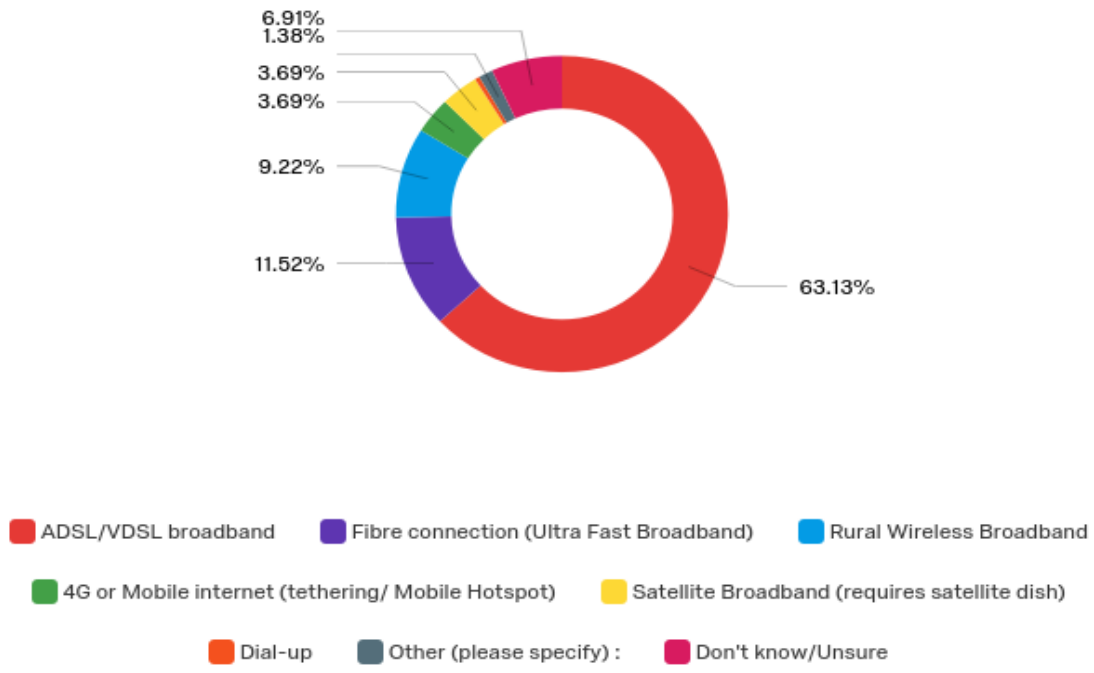


Figure 11 – The respondents' Internet connection type

Table 9 - Internet connection used by respondents

Connection Type	Percentage	Count
ADSL/VDSL Broadband	63.13%	137
Fibre Connection (Ultra Fast Broadband)	11.52%	25
Rural Wireless Broadband	9.22%	20
Don’t Know/Unsure	6.91%	15
4G or Mobile Internet (tethering/Mobile Hotspot)	3.69%	8
Satellite Broadband (Requires Satellite Dish)	3.69%	8
Other	1.38%	3

Dial-up	0.46%	1
Total	100%	217

Internet Services Providers

The results obtained from the survey data for the question "which Internet services provider you are currently with?". It reveals the respondents' current Internet service providers. According to Table 10 and Figure 12, the two major Internet service providers are Spark (43.52%%) and Vodafone (37.04%). This question was multiple choice; therefore, the count for selection is larger than the number of total respondents. In addition, for the other service provider option, there is indicative of a growing marketplace/increased diversity for New Zealand's internet. As there is 11.11% input, which is the third largest response group.

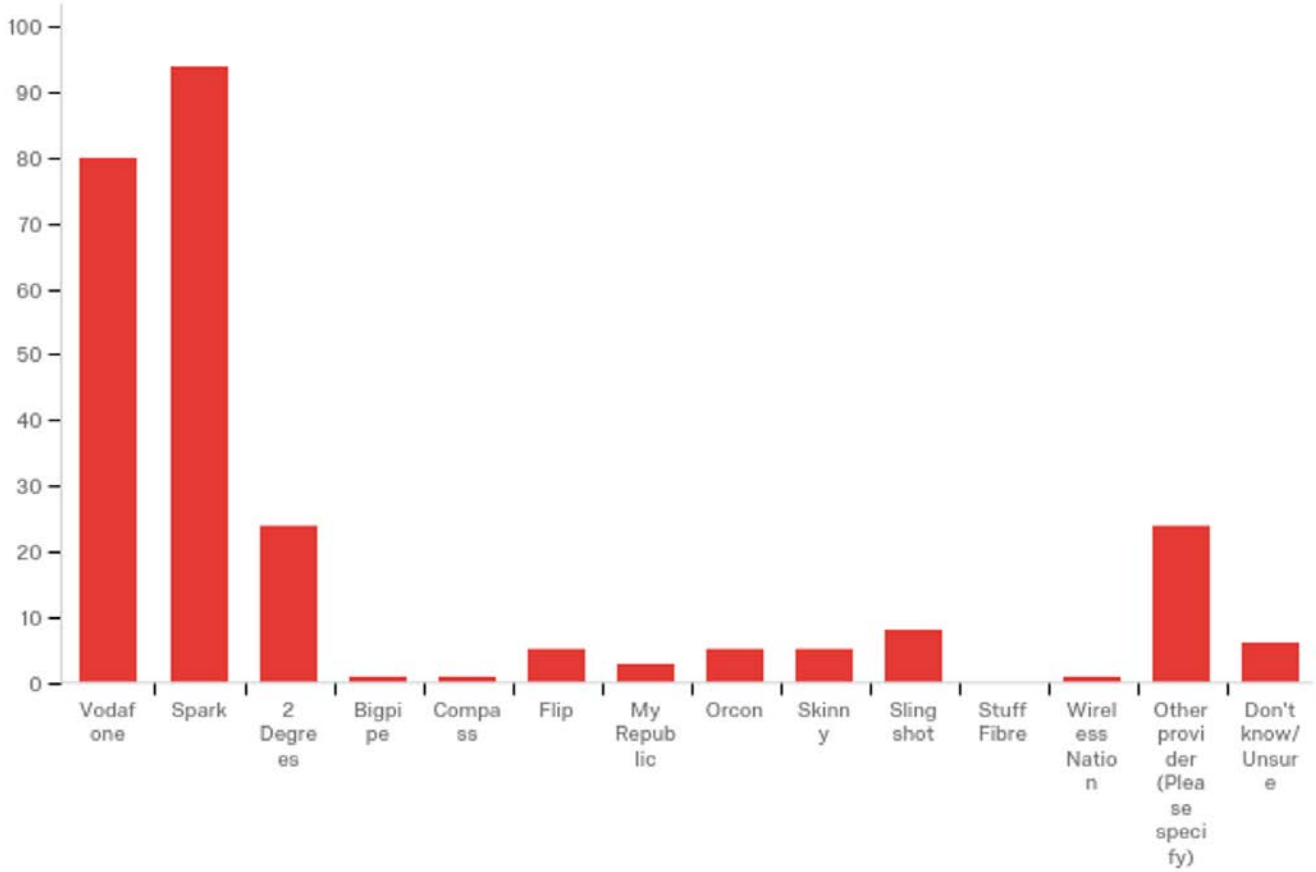


Figure 12 – The Internet services providers the respondents are currently using

Table 10 - Internet services providers currently the respondents are using

Internet Services Provider	Percentage	Count
Spark	43.52%	94
Vodafone	27.04%	80
Other Providers	11.11%	24
2 Degrees	11.11%	24
Slingshot	3.70%	8
Don't Know/Unsure	2.78%	6
Flip	2.31%	5
Skinny	2.31%	5

Orcon	2.31%	5
My Republic	1.39%	3
Compass	0.46%	1
Wireless Nation	0.46%	1
Bigpipe	0.46%	1
Stuff Fibre	0.00%	0
Total	100%	216

Time spent on the Internet

Table 11 and Figure 13 present the daily hour rate the respondents are active on the Internet. There are 38.43% of respondents spending 3-5 hours a day on the Internet, 20.83% spend over 8 hours a day.

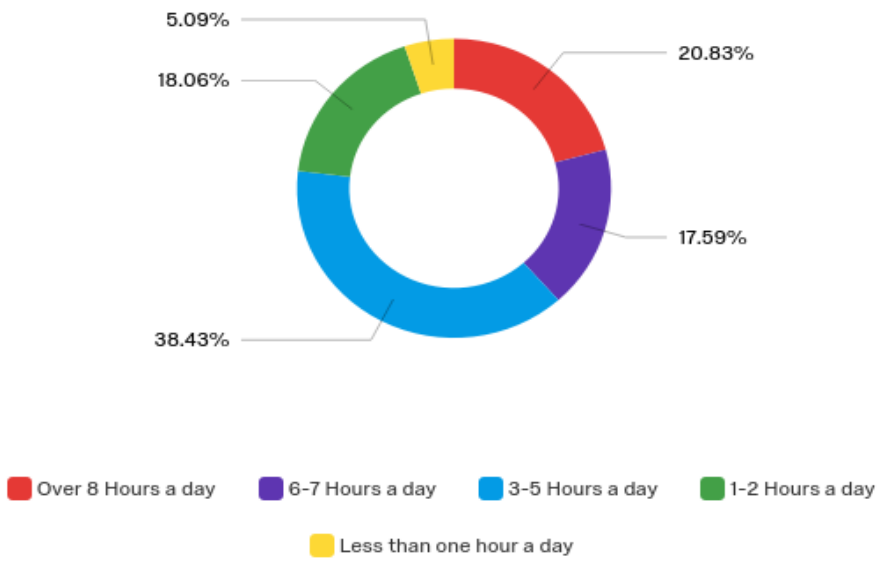


Figure 13 - Internet time spending in hours

Table 11 - Internet time spending daily

Length	Percentage	Count
Over 8 Hours a day	20.83%	45
6-7 Hours a day	17.59%	38
3-5 Hours a day	38.43%	83
1-2 Hours a day	18.06%	39
Less than one hour a day	5.09%	11
Total	100%	216

Age group vs. Daily Internet time

The cross-table with age group and the daily Internet time rate implies the 16-29 age group will likely spend more hours on the Internet. As the age increases, the hours spent on the Internet is decreasing. This finding can be seen in Figure 14 the 8+ hours line. As the age is increasing, the number of respondents is decreasing as well. Moreover, the 3-5 hour line peak at 30-44 and 45-59 age group, then decline, which suggests a correlation between age and the hours spent on the Internet.

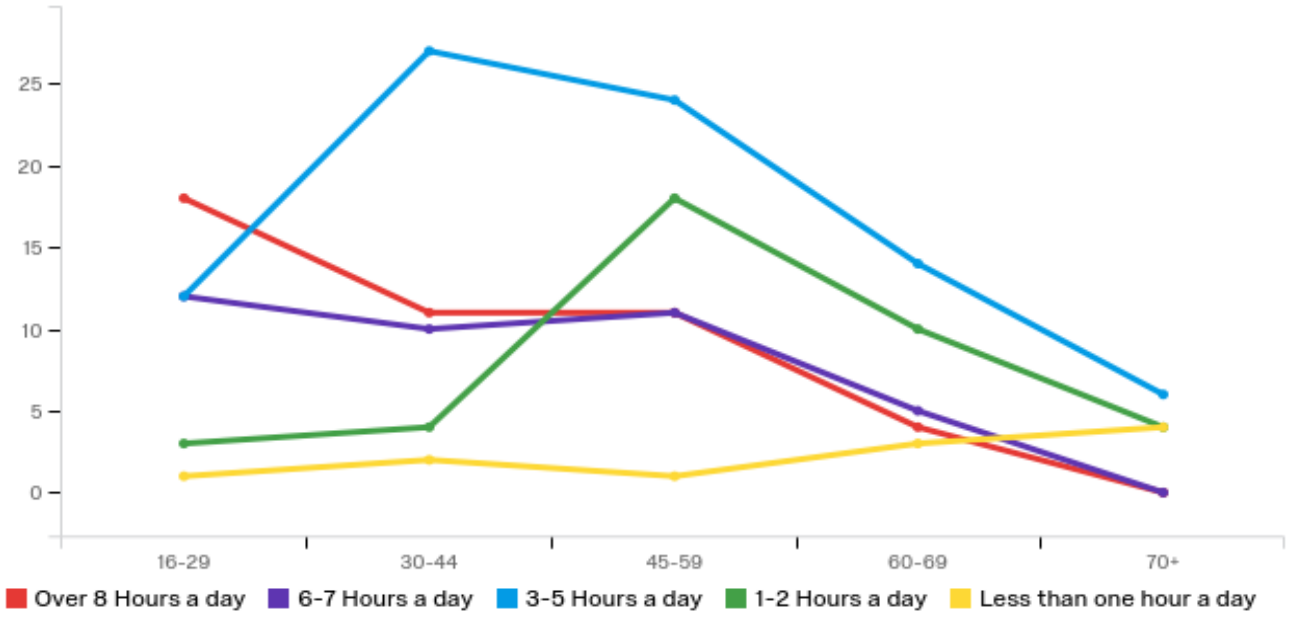


Figure 14 - Line chart showing the Internet hours' trend vs. age

Table 12 - Age groups VS. Daily Internet time

Question	16-29		30-44		45-59		60-69		70+		Total
Over 8 Hours a day	40.91%	18	25.00%	11	25.00%	11	9.09%	4	0.00%	0	44
6-7 Hours a day	31.58%	12	26.32%	10	28.95%	11	13.16%	5	0.00%	0	38
3-5 Hours a day	14.46%	12	32.53%	27	28.92%	24	16.87%	14	7.23%	6	83
1-2 Hours a day	7.69%	3	10.26%	4	46.15%	18	25.64%	10	10.26%	4	39
Less than one hour a day	9.09%	1	18.18%	2	9.09%	1	27.27%	3	36.36%	4	11

Internet usage

This section presents what NZ rural Internet users do on the Internet, in order to discern rural Internet usage behaviour. The results show, the majority of the respondents are using the Internet to check email (85.25% daily); look for information such as news (67.59% daily), search information (62.04% daily), surf the web (71.96% daily); online social networking, such as visit social networking websites (61.86% daily), and instant messenger (63.55% daily); entertainment such as Watch online TV (36.41% daily), look for images (29.30% daily), online music (27.44% daily), look for funny content (24.88% daily). However, there is little on the business and work categories, such as selling things online only 2.8% daily and 8.88% weekly, travel booking is 4.17% daily, and compare prices of products and/or services online 10.08% daily. Details of the results are below.

Information search

Figure 15 and Table 13 present the frequency of information search activities on the Internet. The top three activities are looking for news, using a search engine, and looking for facts (67.59% daily, 62.04%

daily, and 40.93% daily respectively).

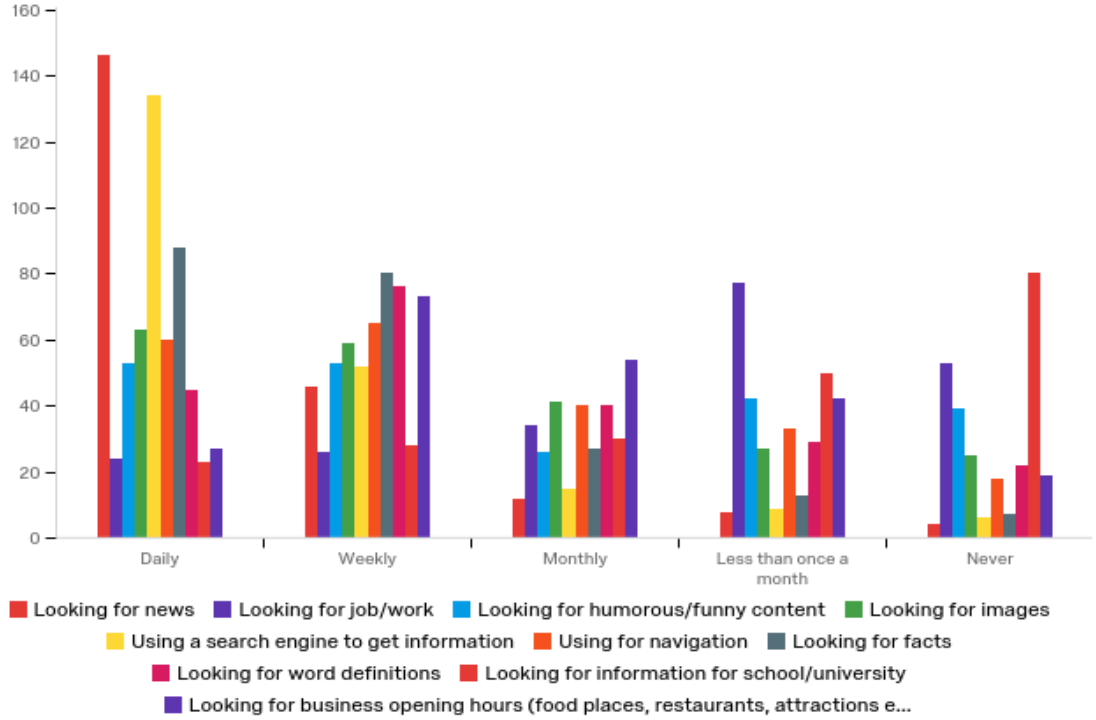


Figure 15 - Information search frequency

Table 13 - Information Search frequency

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Looking for news	67.59%	146	21.30%	46	5.56%	12	3.70%	8	1.85%	4	216
Looking for job/work	11.21%	24	12.15%	26	15.89%	34	35.98%	77	24.77%	53	214
Looking for humorous/funny content	24.88%	53	24.88%	53	12.21%	26	19.72%	42	18.31%	39	213
Looking for images	29.30%	63	27.44%	59	19.07%	41	12.56%	27	11.63%	25	215
Using a search engine to get information	62.04%	134	24.07%	52	6.94%	15	4.17%	9	2.78%	6	216
Using for navigation	27.78%	60	30.09%	65	18.52%	40	15.28%	33	8.33%	18	216
Looking for facts	40.93%	88	37.21%	80	12.56%	27	6.05%	13	3.26%	7	215
Looking for word definitions	21.23%	45	35.85%	76	18.87%	40	13.68%	29	10.38%	22	212
Looking for information for school/university	10.90%	23	13.27%	28	14.22%	30	23.70%	50	37.91%	80	211
Looking for business opening hours (food places, restaurants, attractions etc.)	12.56%	27	33.95%	73	25.12%	54	19.53%	42	8.84%	19	215

Entertainment

Figure 16 and Table 14 present the frequency of entertainment activities on the Internet. The top three

activities are surfing/browsing the web, visiting social networking websites, and watching online TV shows (71.96% daily, 61.86% daily, and 36.41% daily respectively).

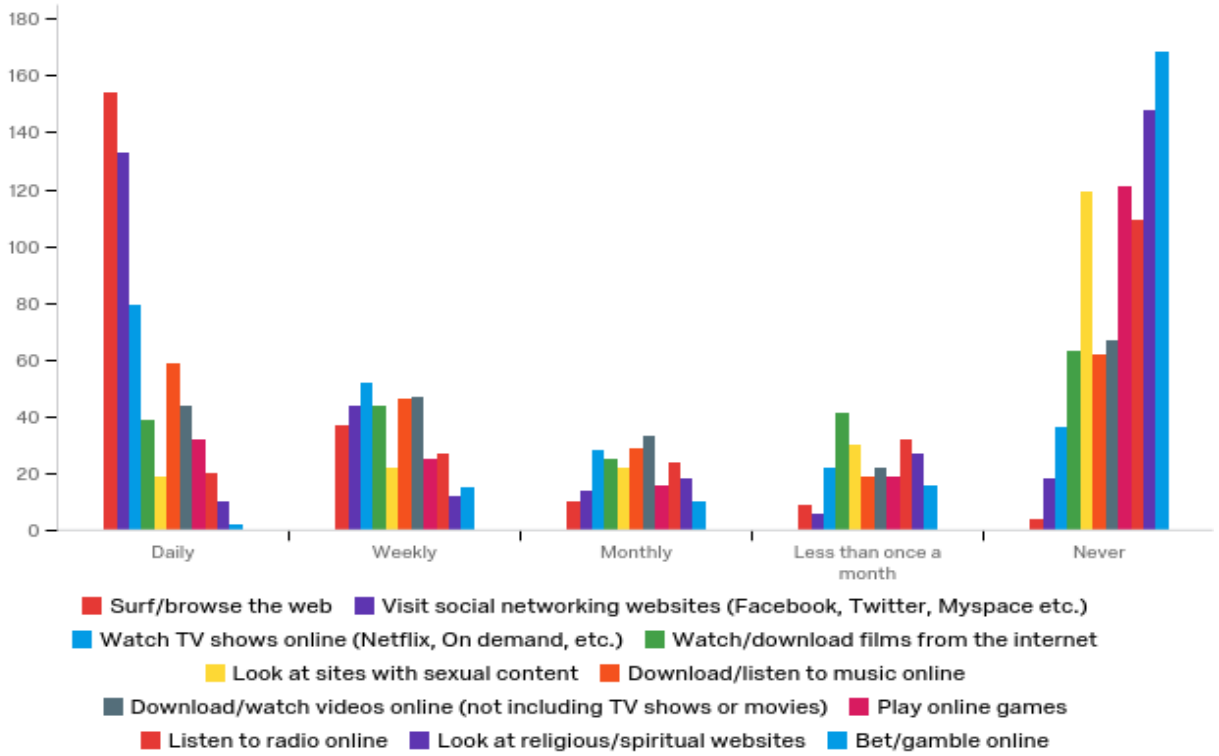


Figure 16 - The frequency of Entertainment activities on the Internet

Table 14 – The frequency of Entertainment activities on the Internet

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Surf/browse the web	71.96%	154	17.29%	37	4.67%	10	4.21%	9	1.87%	4	214
Visit social networking websites (Facebook, Twitter, Myspace etc.)	61.86%	133	20.47%	44	6.51%	14	2.79%	6	8.37%	18	215
Watch TV shows online (Netflix, On demand, etc.)	36.41%	79	23.96%	52	12.90%	28	10.14%	22	16.59%	36	217
Watch/download films from the internet	18.40%	39	20.75%	44	11.79%	25	19.34%	41	29.72%	63	212
Look at sites with sexual content	8.96%	19	10.38%	22	10.38%	22	14.15%	30	56.13%	119	212
Download/listen to music online	27.44%	59	21.40%	46	13.49%	29	8.84%	19	28.84%	62	215
Download/watch videos online (not including TV shows or movies)	20.66%	44	22.07%	47	15.49%	33	10.33%	22	31.46%	67	213
Play online games	15.02%	32	11.74%	25	7.51%	16	8.92%	19	56.81%	121	213
Listen to radio online	9.43%	20	12.74%	27	11.32%	24	15.09%	32	51.42%	109	212
Look at religious/spiritual websites	4.65%	10	5.58%	12	8.37%	18	12.56%	27	68.84%	148	215
Bet/gamble online	0.95%	2	7.11%	15	4.74%	10	7.58%	16	79.62%	168	211

Social Networking

Figure 17 and Table 15 shows the frequency of social networking activities on the Internet. The top two activities are check email and using an instant messenger (82.25% daily and 63.55% daily respectively). Further social networking activities, such a post on social networking sites, share links and make/receive phone calls over the Internet are performed less frequently (32.09% weekly, 27.49% weekly, and 30.52% weekly respectively). For the activities posting comments or messages on discussion boards or forums, posting own content, and upload music, close or more than half of the respondents have never done it before (40.38%, 46.45%, 62.09% respectively).

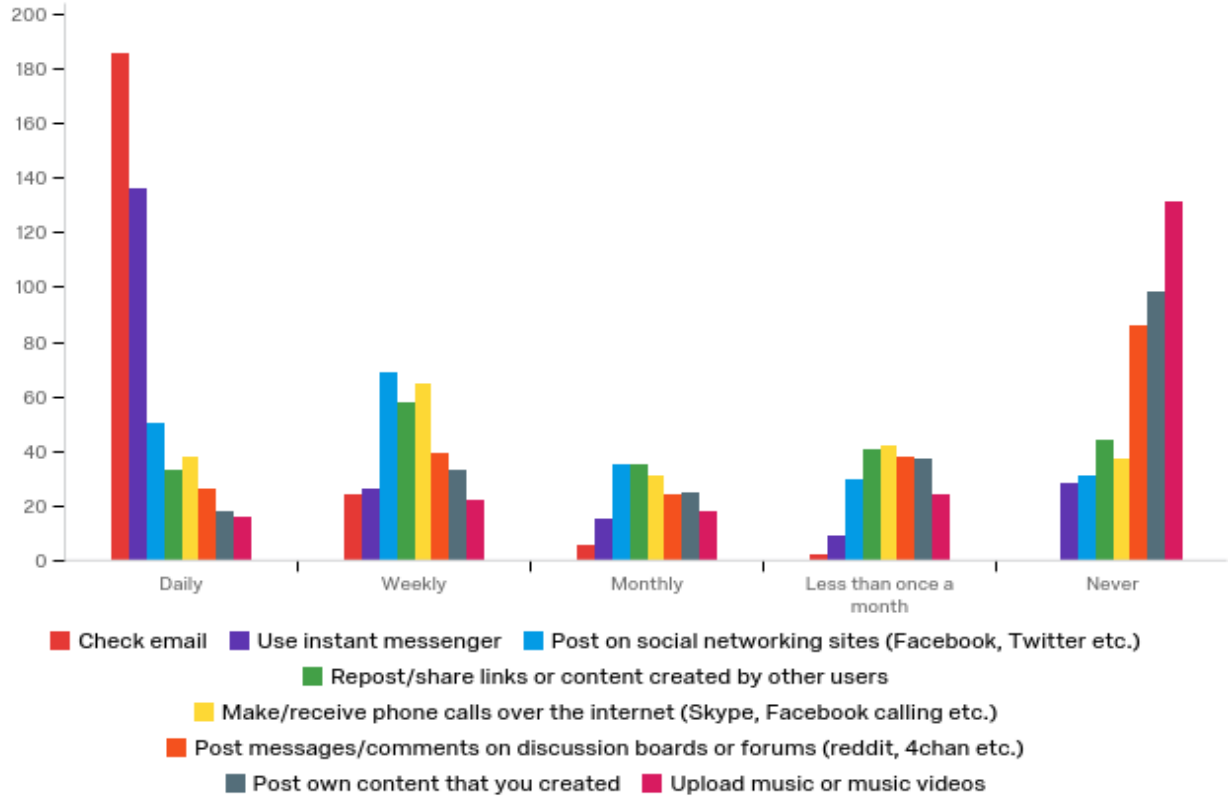


Figure 17 - The frequency of social networking activities on the Internet

Table 15 - The frequency of social networking activities on the Internet

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Check email	85.25%	185	11.06%	24	2.76%	6	0.92%	2	0.00%	0	217
Use instant messenger	63.55%	136	12.15%	26	7.01%	15	4.21%	9	13.08%	28	214
Post on social networking sites (Facebook, Twitter etc.)	23.26%	50	32.09%	69	16.28%	35	13.95%	30	14.42%	31	215
Repost/share links or content created by other users	15.64%	33	27.49%	58	16.59%	35	19.43%	41	20.85%	44	211
Make/receive phone calls over the internet (Skype, Facebook calling etc.)	17.84%	38	30.52%	65	14.55%	31	19.72%	42	17.37%	37	213

Post messages/comments on discussion boards or forums (reddit, 4chan etc.)	12.21%	26	18.31%	39	11.27%	24	17.84%	38	40.38%	86	213
Post own content that you created	8.53%	18	15.64%	33	11.85%	25	17.54%	37	46.45%	98	211
Upload music or music videos	7.58%	16	10.43%	22	8.53%	18	11.37%	24	62.09%	131	211

Business activities

Figure 18 and Table 16 present some of the typical business activities on the Internet to see how frequently the respondents perform them. The top activity is to use online banking (33.02% daily and 40.47% weekly). Other activities especially the selling and buying are the least frequent daily activity (2.80% and 4.15% respectively). Online shopping is twice as apparent as the online selling activities. The top percentage on selling is less than once a month, and online shopping is at a monthly rate. This matches the non-business activities pattern rather than the business activities. Moreover, in online shopping, respondents are more favorable toward using mobile or tablet devices. The daily and weekly usage on mobile/tablet for online shopping is twice that of the buy things online options.

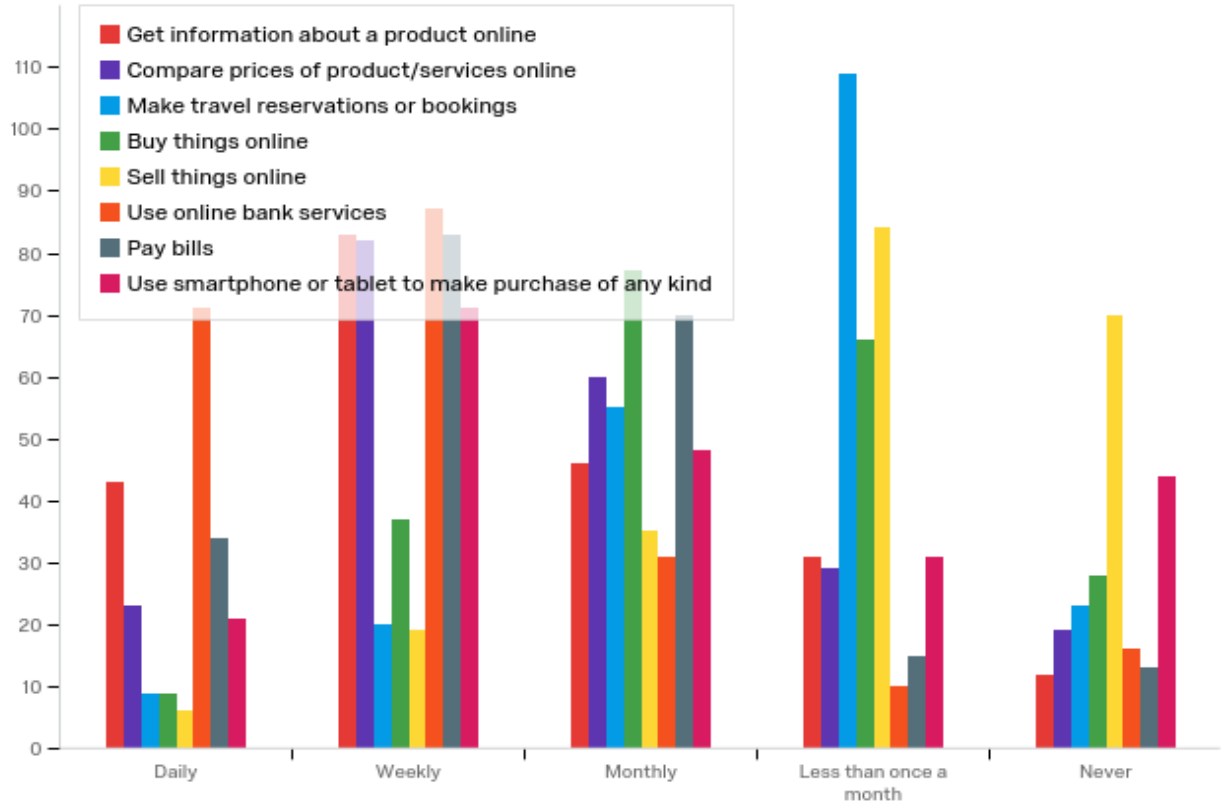


Figure 18 - The frequency of business activities on the Internet

Table 16 - The frequency of business activities on the Internet

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Get information about a product online	20.00%	43	38.60%	83	21.40%	46	14.42%	31	5.58%	12	215
Compare prices of product/services online	10.80%	23	38.50%	82	28.17%	60	13.62%	29	8.92%	19	213

Make travel reservations or bookings	4.17%	9	9.26%	20	25.46%	55	50.46%	109	10.65%	23	216
Buy things online	4.15%	9	17.05%	37	35.48%	77	30.41%	66	12.90%	28	217
Sell things online	2.80%	6	8.88%	19	16.36%	35	39.25%	84	32.71%	70	214
Use online bank services	33.02%	71	40.47%	87	14.42%	31	4.65%	10	7.44%	16	215
Pay bills	15.81%	34	38.60%	83	32.56%	70	6.98%	15	6.05%	13	215
Use smartphone or tablet to make purchase of any kind	9.77%	21	33.02%	71	22.33%	48	14.42%	31	20.47%	44	215

For the further break down with the respondents from different industries, the usage of the Internet for business purposed can be explored further. Selected four industries with at least 6 respondents and relative to the product trading. They are Agriculture, Tourism, Retail, and Healthcare. The data are shown in Table 17 to Table 20. For the product information and price comparison, the activities rates are mainly on weekly and monthly in the four industry. Except for the Retails industry, there are 50% on daily for online product information, and 50% on price compare weekly. These imply the respondents use the Internet for marketing research. However, on the selling online, the Agriculture is 5.26% daily and 0% weekly, Healthcare is 9.09% for daily and weekly. Surprisingly, Retails industry has 0% on both daily and weekly. Tourism has 20% on daily. This can imply they are not selling the product on the Internet to utilize the potential market.

Table 17 - Agriculture/Farming vs. Internet usage

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Get information about a product online	15.79%	3	36.84%	7	21.05%	4	15.79%	3	10.53%	2	19
Compare prices of product/services online	15.79%	3	42.11%	8	21.05%	4	5.26%	1	15.79%	3	19
Make travel reservations or bookings	5.26%	1	10.53%	2	21.05%	4	42.11%	8	21.05%	4	19
Buy things online	5.00%	1	20.00%	4	25.00%	5	20.00%	4	30.00%	6	20
Sell things online	5.26%	1	0.00%	0	15.79%	3	31.58%	6	47.37%	9	19
Use online bank services	31.58%	6	21.05%	4	26.32%	5	5.26%	1	15.79%	3	19
Pay bills	21.05%	4	10.53%	2	57.89%	11	5.26%	1	5.26%	1	19
Use smartphone or tablet to make purchase of any kind	10.53%	2	26.32%	5	36.84%	7	10.53%	2	15.79%	3	19

Table 18 - Hospitality & Tourism vs. Internet usage

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Get information about a product online	12.50%	2	31.25%	5	18.75%	3	25.00%	4	12.50%	2	16
Compare prices of product/services online	12.50%	2	18.75%	3	31.25%	5	12.50%	2	25.00%	4	16

Make travel reservations or bookings	6.25%	1	6.25%	1	31.25%	5	50.00%	8	6.25%	1	16
Buy things online	12.50%	2	18.75%	3	25.00%	4	18.75%	3	25.00%	4	16
Sell things online	20.00%	3	0.00%	0	33.33%	5	26.67%	4	20.00%	3	15
Use online bank services	31.25%	5	56.25%	9	6.25%	1	6.25%	1	0.00%	0	16
Pay bills	6.25%	1	62.50%	10	25.00%	4	0.00%	0	6.25%	1	16
Use smartphone or tablet to make purchase of any kind	6.25%	1	31.25%	5	25.00%	4	12.50%	2	25.00%	4	16

Table 19 - Retail vs. Internet usage

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Get information about a product online	50.00%	3	0.00%	0	16.67%	1	33.33%	2	0.00%	0	6
Compare prices of product/services online	16.67%	1	50.00%	3	0.00%	0	33.33%	2	0.00%	0	6
Make travel reservations or bookings	0.00%	0	0.00%	0	16.67%	1	83.33%	5	0.00%	0	6
Buy things online	0.00%	0	33.33%	2	16.67%	1	50.00%	3	0.00%	0	6
Sell things online	0.00%	0	0.00%	0	33.33%	2	33.33%	2	33.33%	2	6
Use online bank services	66.67%	4	33.33%	2	0.00%	0	0.00%	0	0.00%	0	6
Pay bills	50.00%	3	33.33%	2	16.67%	1	0.00%	0	0.00%	0	6
Use smartphone or tablet to make purchase of any kind	0.00%	0	50.00%	3	50.00%	3	0.00%	0	0.00%	0	6

Table 20 - Healthcare vs. Internet usage

Question	Daily		Weekly		Monthly		Less than once a month		Never		Total
Get information about a product online	27.27%	3	45.45%	5	18.18%	2	9.09%	1	0.00%	0	11
Compare prices of product/services online	18.18%	2	36.36%	4	45.45%	5	0.00%	0	0.00%	0	11
Make travel reservations or bookings	18.18%	2	0.00%	0	27.27%	3	54.55%	6	0.00%	0	11
Buy things online	9.09%	1	9.09%	1	45.45%	5	36.36%	4	0.00%	0	11
Sell things online	9.09%	1	9.09%	1	9.09%	1	63.64%	7	9.09%	1	11
Use online bank services	45.45%	5	45.45%	5	9.09%	1	0.00%	0	0.00%	0	11
Pay bills	0.00%	0	54.55%	6	36.36%	4	9.09%	1	0.00%	0	11
Use smartphone or tablet to make purchase of any kind	18.18%	2	36.36%	4	18.18%	2	18.18%	2	9.09%	1	11

Desired activities on the Internet

Figure 19 and Table 21 reveal the activities the respondents would like to do more of on the Internet. The top result is looking for information (20.75%). Interestingly, the second highest result is "do not know/prefer not to answer" (17.92%). This suggests a lack of awareness of the broad availability of information and services on the Internet.

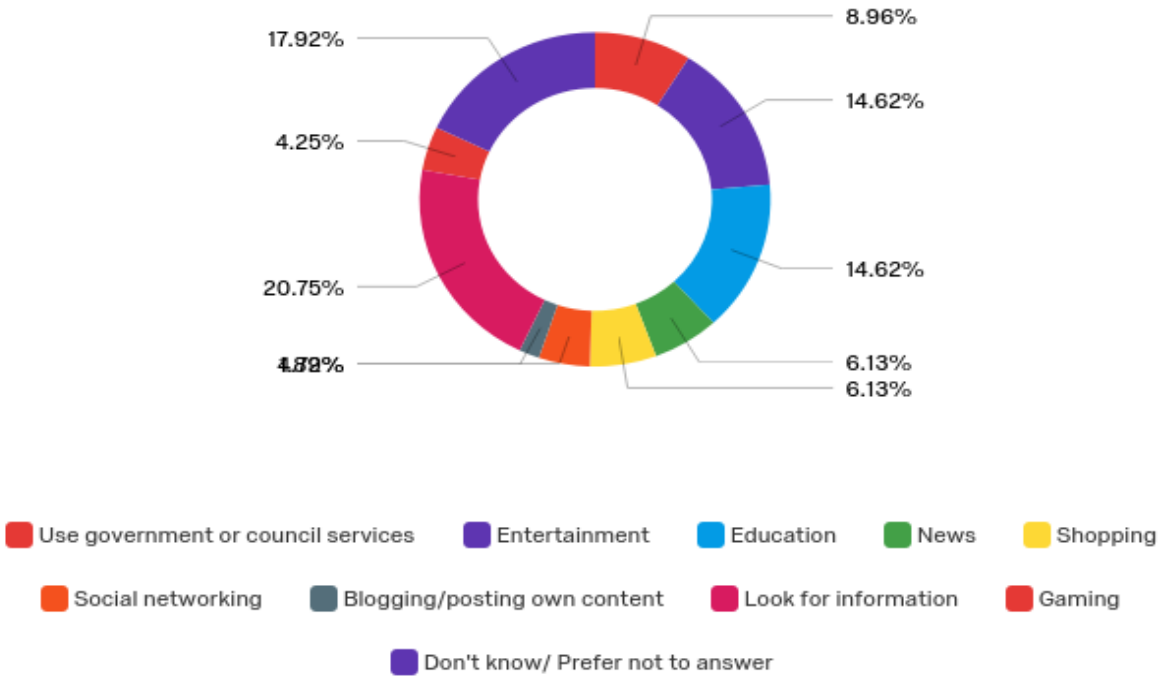


Figure 19 - The activities respondents like to do more of online

Table 21 - The activities respondents like to do more of online

Answer	Percentage	Count
Use government or council services	8.96%	19
Entertainment	14.62%	31
Education	14.62%	31
News	6.13%	13
Shopping	6.13%	13
Social networking	4.72%	10
Blogging/posting own content	1.89%	4
Look for information	20.75%	44

Gaming	4.25%	9
Don't know/ Prefer not to answer	17.92%	38
Total	100%	212

Cloud

Figure 20 and Table 22 show the percentage of the respondents using 'the Cloud' or cloud-based services. There are 50.56% of respondents with an answer. However, 14.75% of the respondents' answered "unsure". This may indicate that they have insufficient knowledge of cloud services or are unaware of it.

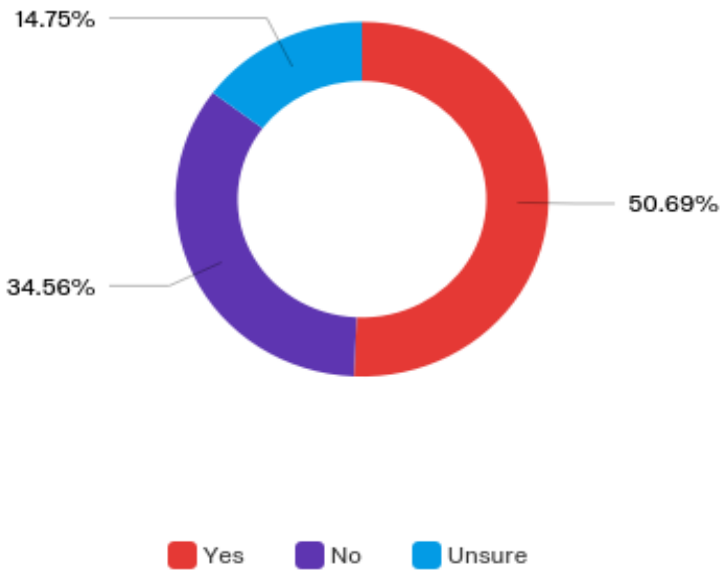


Figure 20 – Cloud usage

Table 22 - Cloud usage

Answer	Percentage	Count
Yes	50.69%	110
No	34.56%	75
Unsure	14.75%	32
Total	100%	217

Cloud usage

Figure 21 and Table 23 present the cloud services usage statistic. The top cloud service activity is cloud storage (75.45%), which is a fundamental function of the cloud services. The second highest is file sharing functions (50.91%), which co-exists with the storage function. The least selected activity is Cloud

applications, with only 31.82% of cloud user respondents.

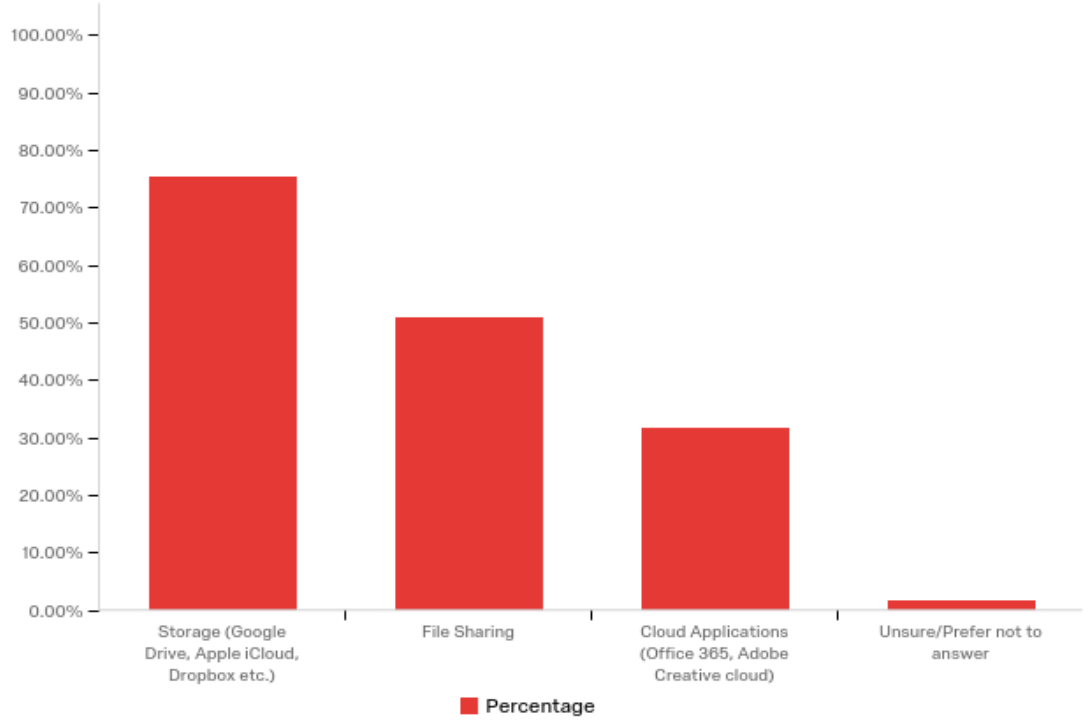


Figure 21 - Cloud usage chart

Table 23 - Cloud usage table

Answer	Percentage	Count
Storage (Google Drive, Apple iCloud, Dropbox etc.)	75.45%	83
Cloud Applications (Office 365, Adobe Creative Cloud)	31.82%	35
File Sharing	50.91%	56
Unsure/Prefer not to answer	1.82%	2
Total	100%	110

Cloud usage vs. Gender

Figure 22 and Table 24 present the gender group distribution in each cloud service usage. The red bar is representing the male group, purple is female, and the blue bar is gender diverse. At the storage function, both male and female are generally equally distributed with the consideration of the number of male and female in the respondent group. However, on the file sharing and cloud application, female users are less than half the number of the male users. The file sharing and cloud applications may be considered more complicated to work with and may be reflected in our results.

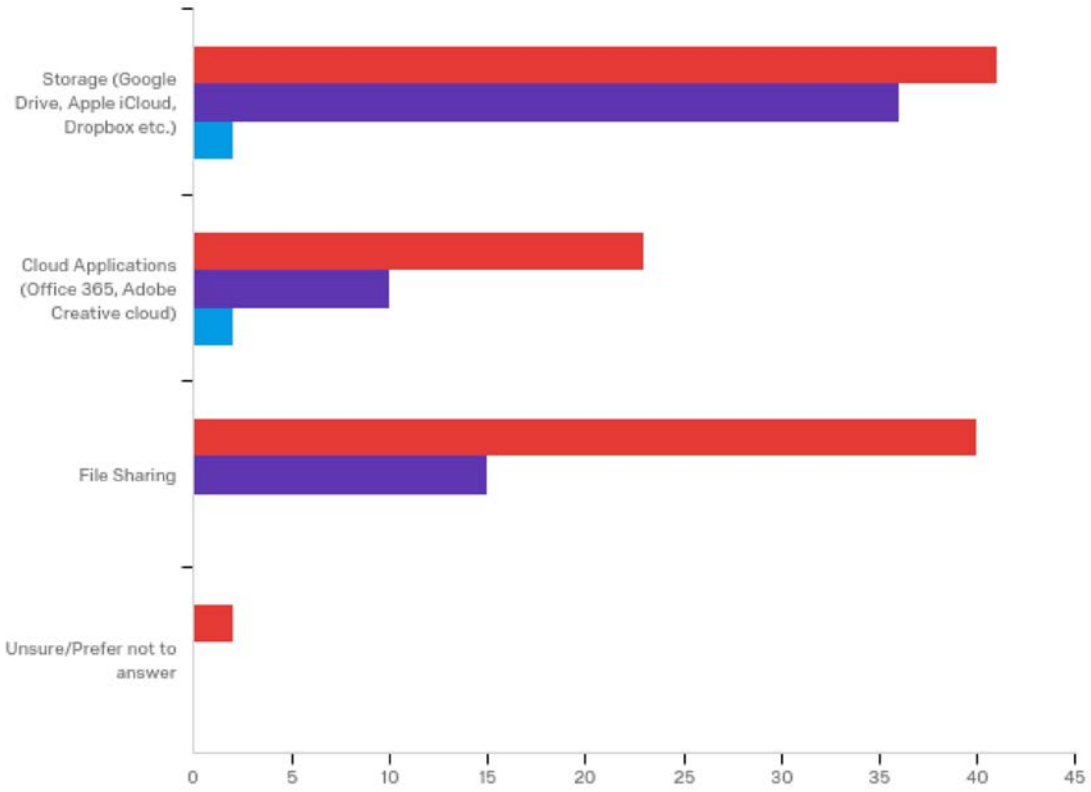


Figure 22 - Cloud usage vs. Gender group

Table 24 - Cloud usage vs. Gender group

Question	Male		Female		Gender Diverse (please specify)		Total
Cloud Applications (Office 365, Adobe Creative cloud)	65.71%	23	28.57%	10	5.71%	2	35
Storage (Google Drive, Apple iCloud, Dropbox etc.)	51.90%	41	45.57%	36	2.53%	2	79
File Sharing	72.73%	40	27.27%	15	0.00%	0	55
Unsure/Prefer not to answer	100.00%	2	0.00%	0	0.00%	0	2

Cloud usage vs. Employment Status

Figure 23 and Table 25 present the cross-table data between cloud usage and the users' employment status. The employed respondents appeared in all three cloud service options with the highest proportion as 70% of the respondents are employed. Moreover, with cloud applications, 85.71% of users are employed and the rest are students. This could indicate the Cloud applications are more specific to business purposes and activities to improve the productivity.

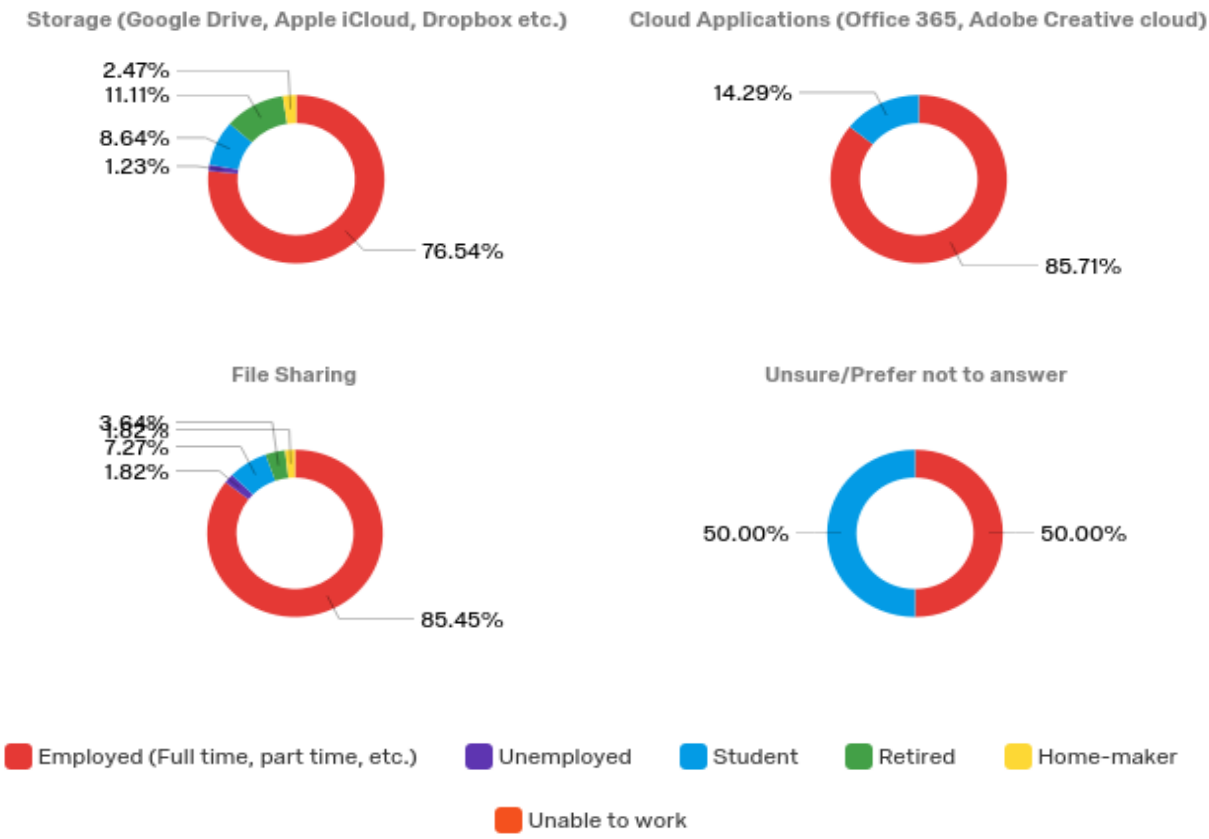


Figure 23 - Cloud usage vs. Employment status

Table 25 - Cloud usage vs. Employment status

Question	Employed (Full time, part time, etc.)		Unemployed		Student		Retired		Home-maker		Unable to work		Total
Cloud Applications (Office 365, Adobe Creative cloud)	85.71%	30	0.00%	0	14.29%	5	0.00%	0	0.00%	0	0.00%	0	35
File Sharing	85.45%	47	1.82%	1	7.27%	4	3.64%	2	1.82%	1	0.00%	0	55
Storage (Google Drive, Apple iCloud, Dropbox etc.)	76.54%	62	1.23%	1	8.64%	7	11.11%	9	2.47%	2	0.00%	0	81
Unsure/Prefer not to answer	50.00%	1	0.00%	0	50.00%	1	0.00%	0	0.00%	0	0.00%	0	2

Reasons for not using cloud services

Figure 24 and Table 26 present the reasons for the respondents not using Cloud services. Interestingly, 41.33% of those who do not use Cloud services indicated they do not know how to use it and another 32% stated they do not find it useful. The number of respondents who do not find Cloud services useful can possibly suggest they do not know what the Cloud can benefit them. In such case, 73.33% of the non-Cloud user respondents do not have sufficient knowledge or awareness of Cloud technology.

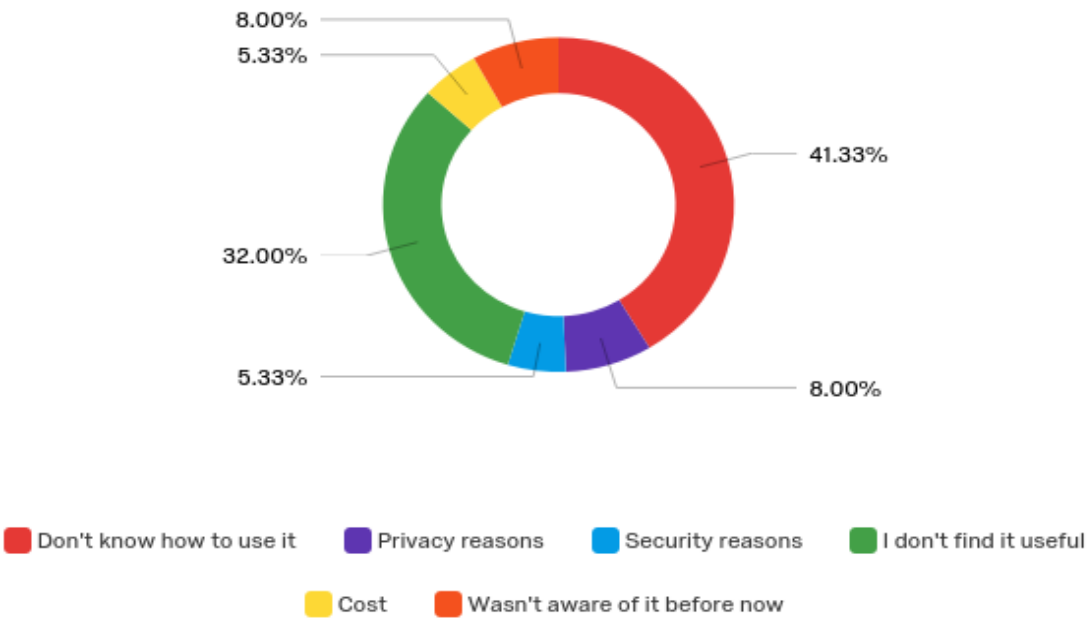


Figure 24 - The reasons for not using the Cloud

Table 26 - The reasons for not using the Cloud

Answer	Percentage	Count
Don't know how to use it	41.33%	31
Privacy reasons	8.00%	6
Security reasons	5.33%	4
I don't find it useful	32.00%	24
Cost	5.33%	4
Wasn't aware of it before now	8.00%	6
Total	100%	75

Reasons for not using the Cloud vs. Gender

Figure 25 and Table 27 present the gender distribution in answering the reasons for not using the Cloud. The red bar represents male responses, and purple represents female responses. For the main response, 'Don't know how to use it' the female number is more than triple of male respondents. Conversely, the technical reasons, such as security, privacy, male respondents have more than triple the number of female responses.

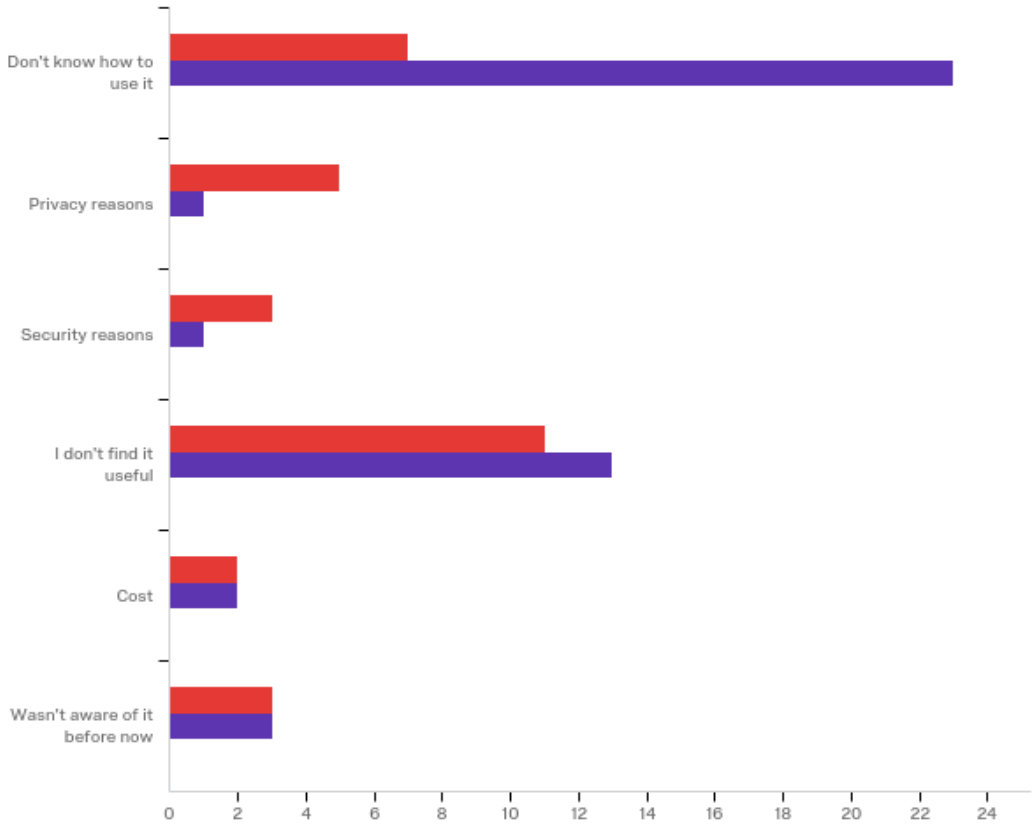


Figure 25 - Reasons for not using Cloud vs. Gender

Table 27 - Reasons for not using Cloud vs. Gender

Question	Male		Female		Gender Diverse (please specify)		Total
Don't know how to use it	23.33%	7	76.67%	23	0.00%	0	30
Privacy reasons	83.33%	5	16.67%	1	0.00%	0	6
Security reasons	75.00%	3	25.00%	1	0.00%	0	4
I don't find it useful	45.83%	11	54.17%	13	0.00%	0	24
Cost	50.00%	2	50.00%	2	0.00%	0	4
Wasn't aware of it before now	50.00%	3	50.00%	3	0.00%	0	6

Knowledge and Skill on Internet

This section presents the NZ rural Internet users' education level or skill in Internet usage.

Self-evaluation on the ability to the use of the Internet

Figure 26 and Table 28 present confidence level of respondents towards the use of the Internet. 46.54% of respondents perceived themselves as good at using the Internet and 31.80% of respondents rated that they are excellent. Only about 6% of respondents do not have the confidence to use the Internet.

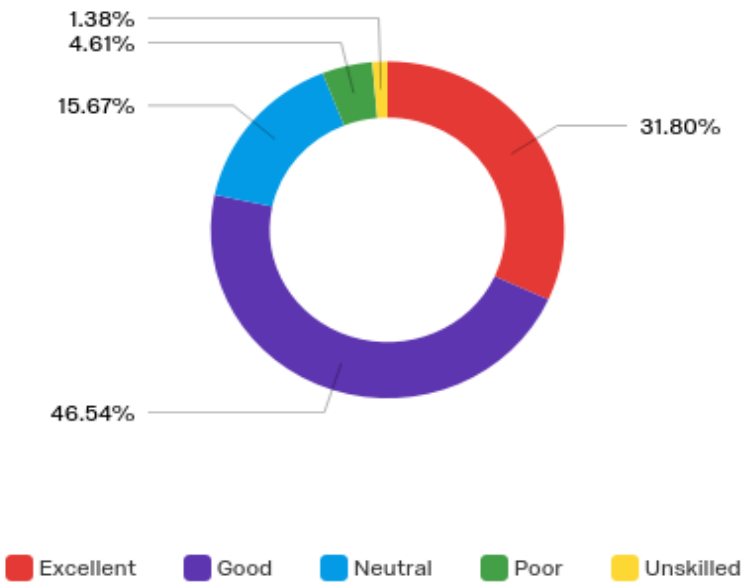


Figure 26 - Self-evaluation on the ability to use the Internet

Table 28 - Ability for using the Internet

Answer	Percentage	Count
Excellent	31.80%	69
Good	46.54%	101
Neutral	15.67%	34
Poor	4.61%	10
Unskilled	1.38%	3
Total	100%	217

Education on Internet

Figure 27 presents the ratio of the respondents who have received lessons on how to use the Internet. It appears that 70.83% of the respondents have never received lessons before. Compared to the previous self-evaluation results; 48.97% of the respondents who have never received a lesson rate themselves good or excellent.

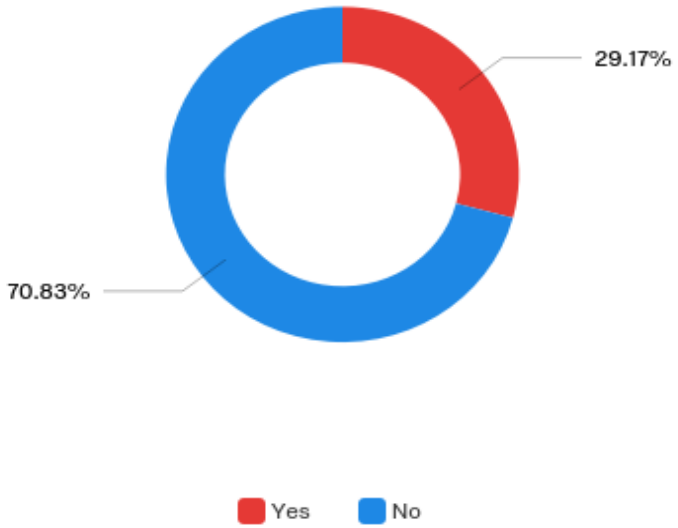


Figure 27 – Received Instructional/educational lessons on how to use the Internet

Lessons Evaluation

Figure 28 and Table 29 present the evaluation results from the respondents who have received lessons. The results show 56.25% of the respondents think they were useful, 26.56% of the respondents think they had a neutral effect; only 7.82% of the respondents considered them unconstructive.

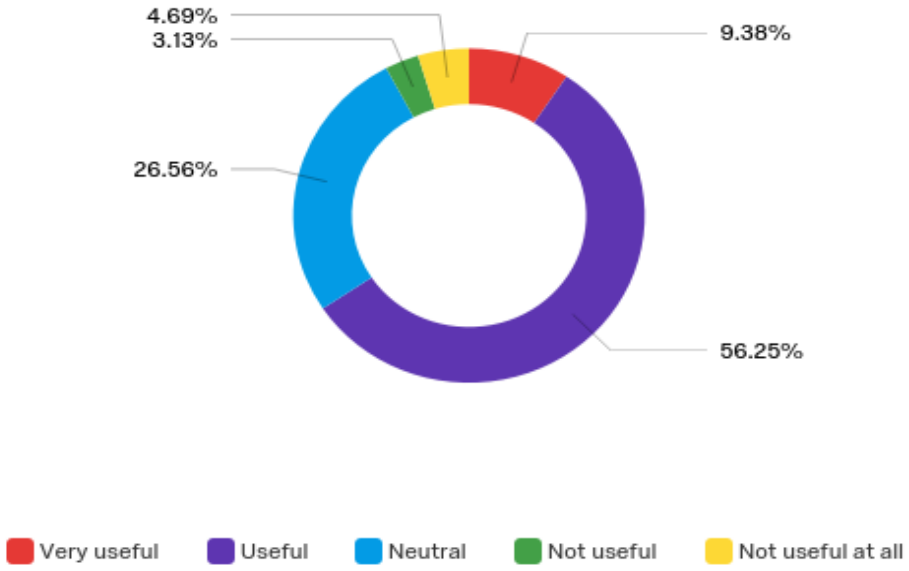


Figure 28 - Lesson evaluation

Table 29 - Lesson evaluation

Answer	Percentage	Count
Very useful	9.38%	6
Useful	56.25%	36
Neutral	26.56%	17
Not useful	3.13%	2
Not useful at all	4.69%	3
Total	100%	64

Further interests in learning

Figure 29 and Table 30 display the interest level of respondents in further learning on how to use the Internet; 40.63% of the respondents felt neutral, and 50% of the respondents stated they were interested or very interested in doing so. The 40 % of respondents who selected neutral maybe unaware what else the Internet can do for them. In other words, they might need more education on the Internet to understand what else the Internet can do to help improve their quality of life and work productivity.

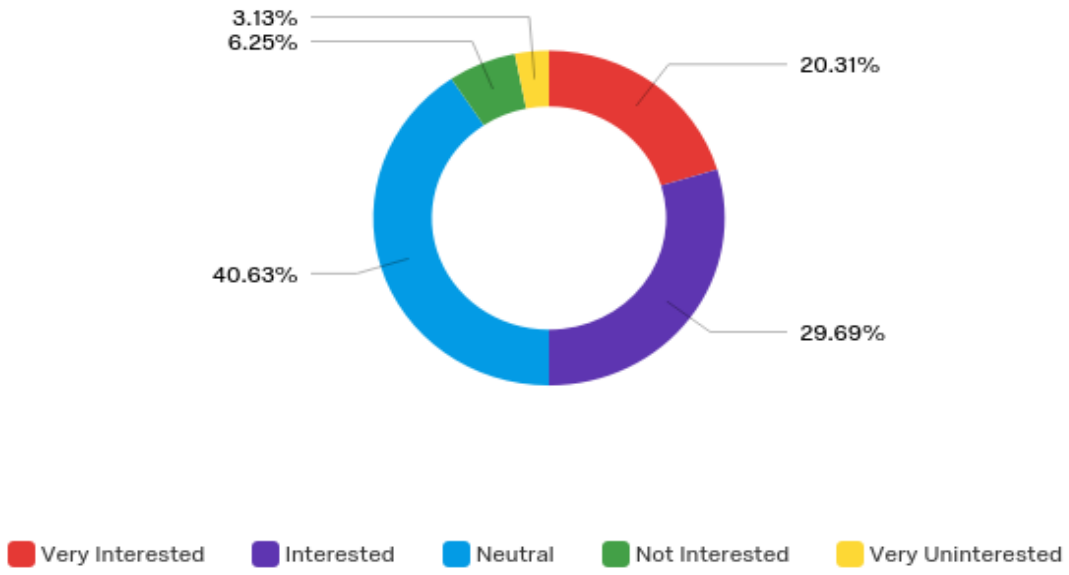


Figure 29 - Further interests in learning

Table 30 - Further interests in learning

Answer	Percentage	Count
Very Interested	20.31%	13

Interested	29.69%	19
Neutral	40.63%	26
Not Interested	6.25%	4
Very Uninterested	3.13%	2
Total	100%	64

Source of Internet education

Figure 30 and Table 31 present the places from where the respondents obtained an education. The top two sources are from a knowledgeable family member/friend and self-taught at home (35.94% and 29.69% respectively). This is considered informal training, compared to formal lessons from an education provider and upskill sessions (7.81% and 15.63% respectively). More appropriate training sessions, courses are expected can be provided by the government and local communities.

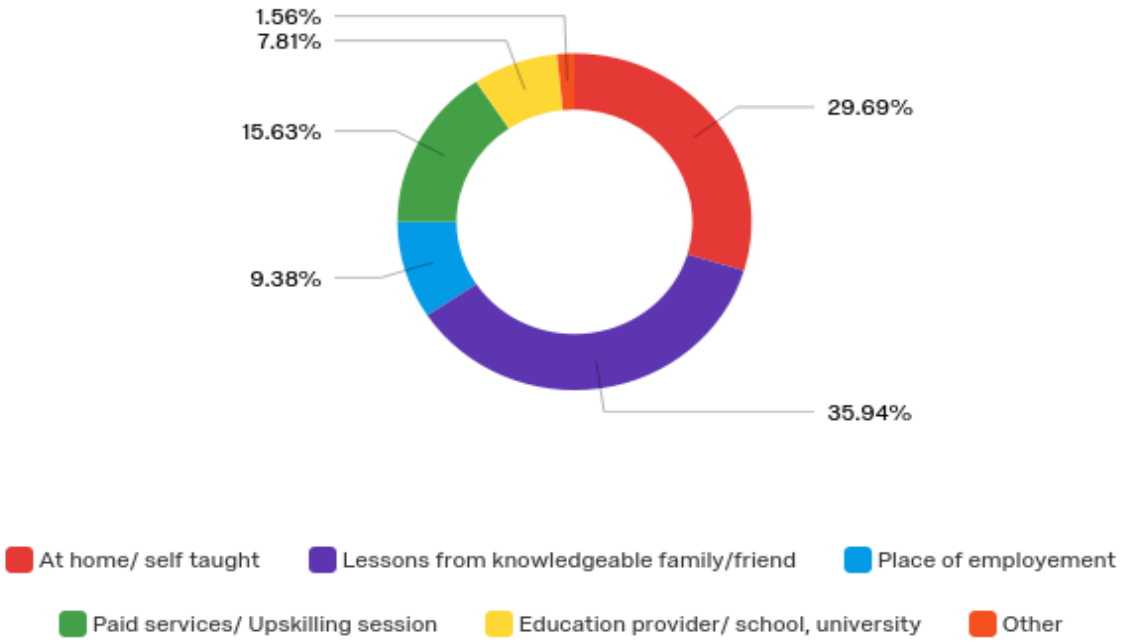


Figure 30 - Source of Internet education

Table 31 - Source of Internet education

Answer	Percentage	Count
At home/ self taught	29.69%	19
Lessons from knowledgeable family/friend	35.94%	23
Place of employment	9.38%	6

Paid services/ Upskilling session	15.63%	10
Education provider/ school, university	7.81%	5
Other	1.56%	1
Total	100%	64

Source of lesson vs. Gender

Figure 31 has further presented the source of the education by cross-tabling the data with gender information. It shows that the number of female self-taught at home is double that of the male responses. Future studies are required to determine the significance of this.

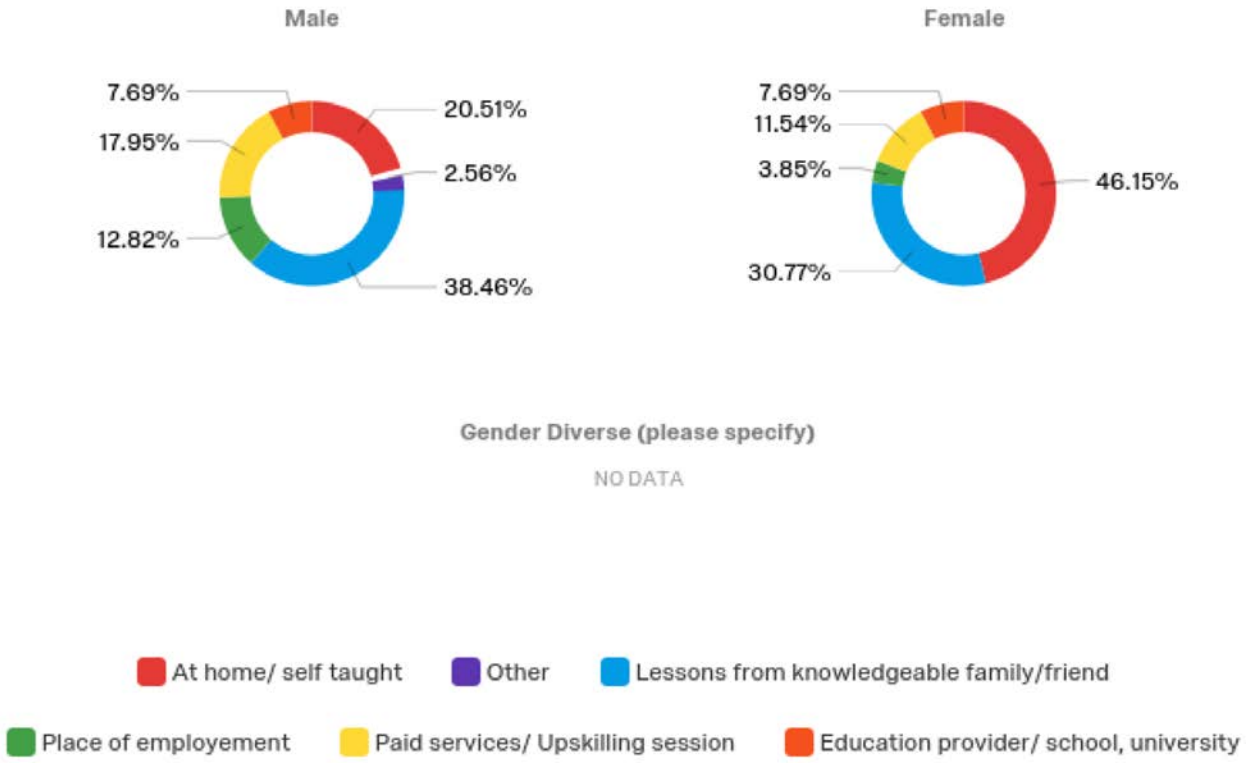


Figure 31 - Source of lesson vs. Gender

Internet Usage Experiences

This section presents how NZ rural Internet users think about what the Internet means to them and the quality of their Internet connection.

Importance of Internet for everyday life

The survey question was asking “how important is the internet to your everyday life?”. The results reveal there are 54.07% of respondents who believe the Internet is ‘very important’ to their everyday life. There are 26.79% think it is ‘important’, which shows there are more than 80% of people think the Internet is important. Only less than 5% think the Internet is of little or no importance. The details of this information are displayed in Table 32 and Figure 32. According to the Internet usage results, there are a significant

number of respondents who search for information online rather than go to the library, making phone calls, have their entertainment online, as well as utilization of social networking. The Internet is already part of their life. Thus, they think the Internet is essential to them.

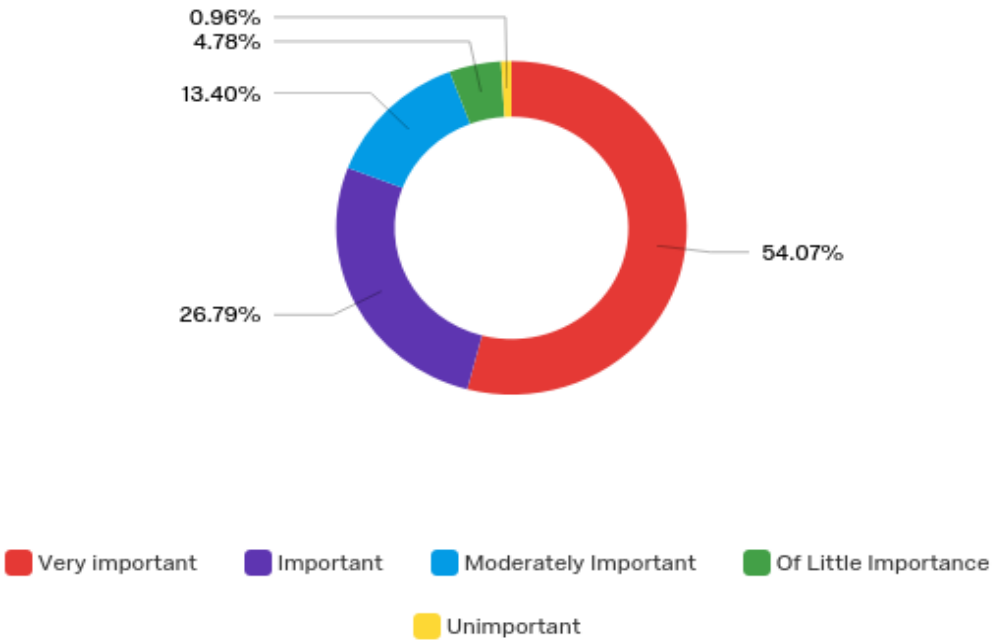


Figure 32 - Donut chart showing the critical level of the Internet to the respondents' everyday life

Table 32 - Importance of Internet to respondents' everyday life

Important Level	Percentage	Count
Very Important	54.07%	113
Unimportant	0.96%	2
Of Little Important	4.78%	10
Moderately Important	13.40%	28
Important	26.79%	56
Total	100%	209

Importance of Information sources

In this question, there are four information sources listed; they are Internet, TV, radio, and newspaper. 88.94% of the respondents think the Internet is important or very important information sources for them. TV is the next essential source as the selection distributions are in the first three levels of importance (23.26%, 28.84%, and 26.05% respectively). The radio is the third, and the least important source is newspaper compared to the other three.

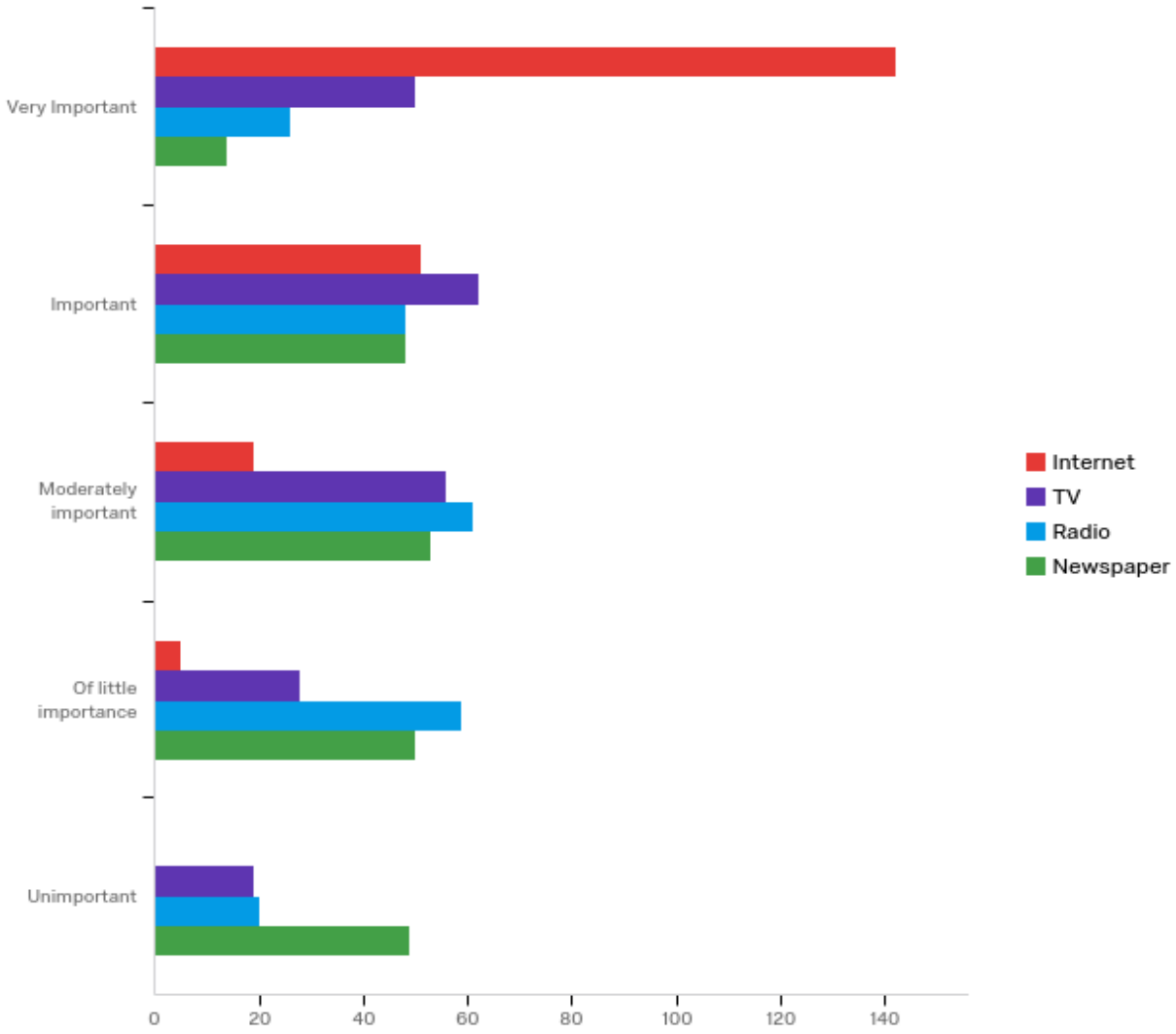


Figure 33 - Importance of the information sources to respondents

Table 33 - Importance of the information sources to respondents

Question	Very Important		Important		Moderately important		Of little importance		Unimportant		Total
Internet	65.44%	142	23.50%	51	8.76%	19	2.30%	5	0.00%	0	217
TV	23.26%	50	28.84%	62	26.05%	56	13.02%	28	8.84%	19	215
Radio	12.15%	26	22.43%	48	28.50%	61	27.57%	59	9.35%	20	214
Newspaper	6.54%	14	22.43%	48	24.77%	53	23.36%	50	22.90%	49	214

Information credibility

Figure 34 and Table 34 present the credibility of the Information on the Internet from the perspective of the respondents. 51.15% of the respondents believe it is reliable. Neutral (32.72%). 7.37% of the respondents believe the information on the Internet is not reliable. Further studies are required to assess

the source of this response.

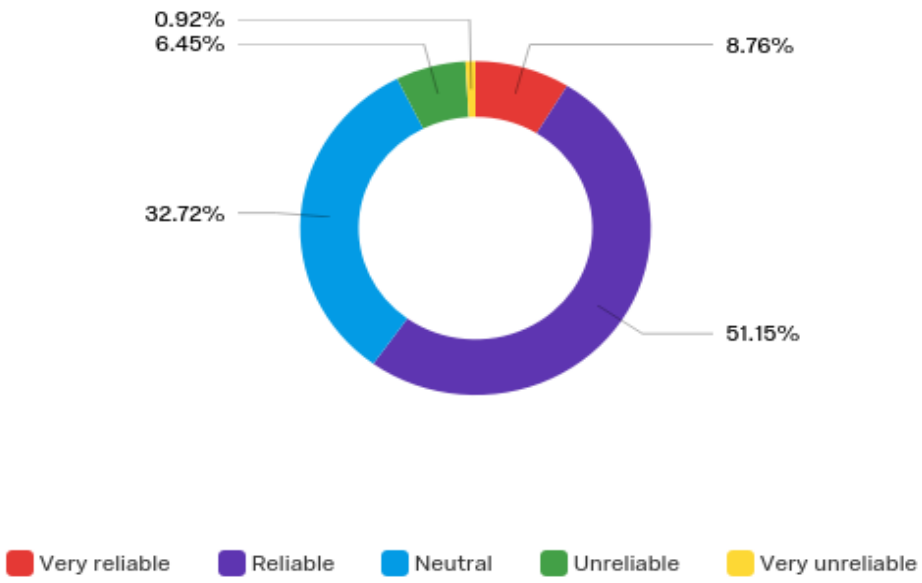


Figure 34 - Information credibility

Table 34 - Information credibility

Answer	Percentage	Count
Very reliable	8.76%	19
Reliable	51.15%	111
Neutral	32.72%	71
Unreliable	6.45%	14
Very unreliable	0.92%	2
Total	100%	217

Internet speed

Figure 35 and Table 35 present the satisfaction level of the respondents felt with their Internet speed. The top answer is 35.48% on satisfied of their Internet speed. The second top answer is neutral (28.57%). However, 27.65% of the respondents think their Internet speed fails their expectations.

To have a closer examination of the unsatisfied rating, the results have been broken down into different regions. As can be seen in Figure 36 and Table 36, there are 64.17% respondents from Taranaki who are unsatisfied or very unsatisfied with their connection speed. The second highest is the Gisborne (50%) region. However, there are only two respondents from Gisborne; most likely due to sampling bias and therefore does not reflect the local situation. The third is the Bay of Plenty, it has 40% of the respondents' who feel unsatisfied or very unsatisfied with their Internet speed.

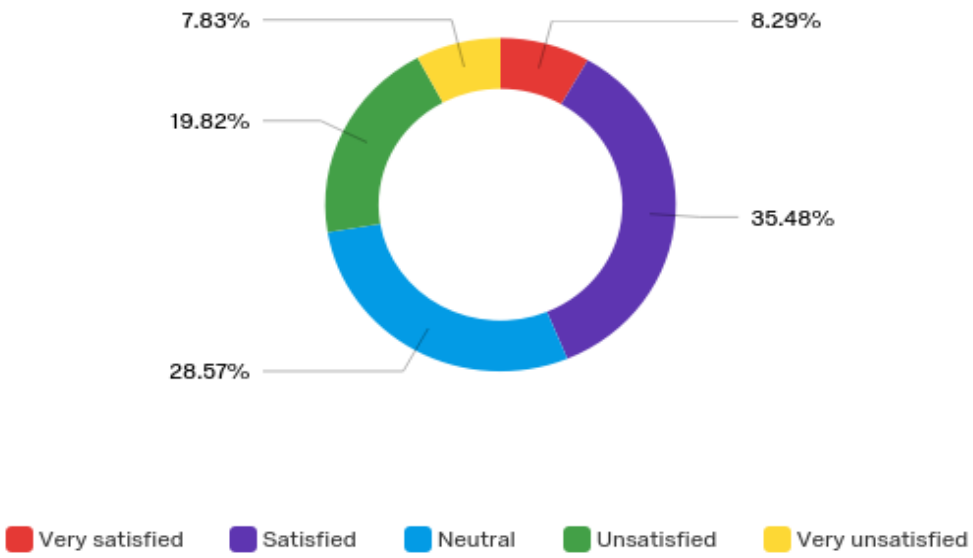


Figure 35 - Internet speed satisfaction

Table 35 - Internet speed satisfaction

Answer	Percentage	Count
Very satisfied	8.29%	18
Satisfied	35.48%	77
Neutral	28.57%	62
Unsatisfied	19.82%	43
Very unsatisfied	7.83%	17
Total	100%	217

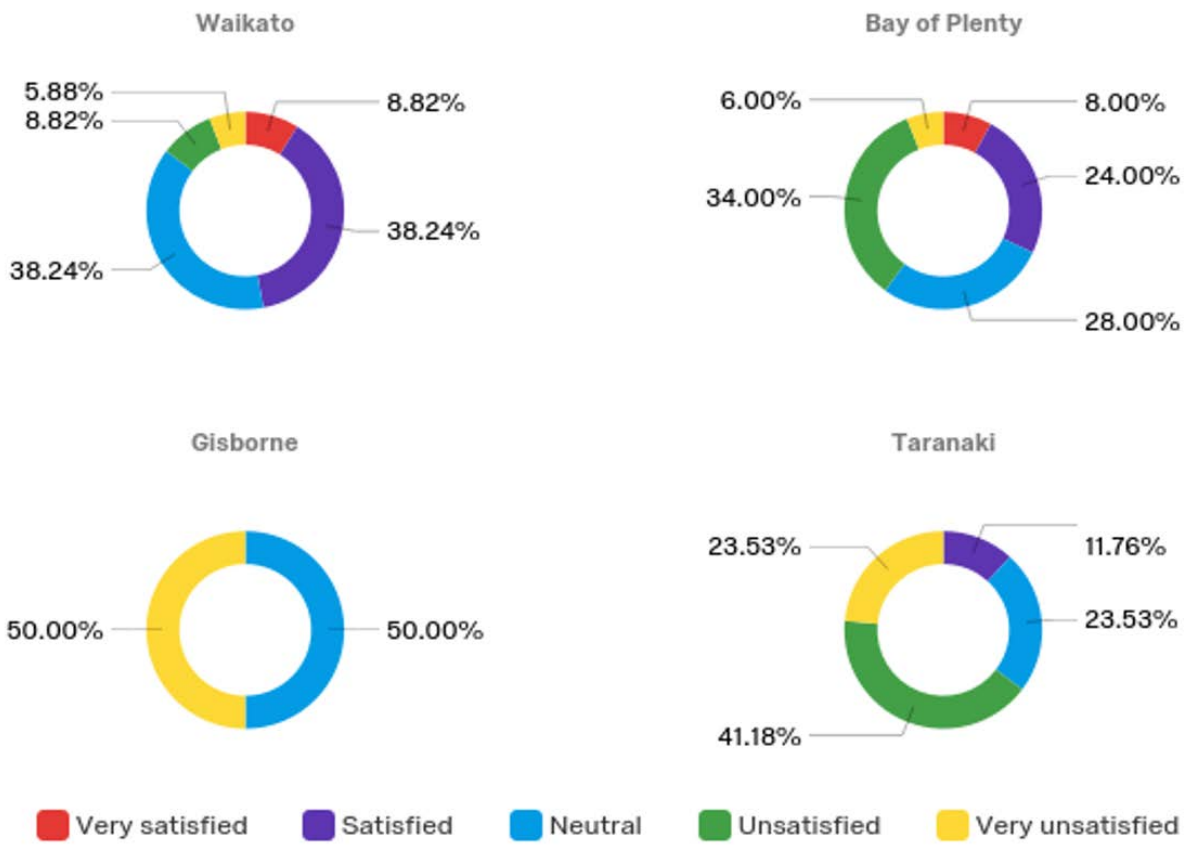


Figure 36 - Internet speed satisfaction level vs. region

Table 36 - Internet speed satisfaction level vs. region

Question	Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Taranaki	Manawatu-Wanganui	Hawkes Bay	Wellington
Very satisfied	0.00%	12.68%	8.82%	8.00%	0.00%	0.00%	0.00%	8.33%	0.00%
Satisfied	29.41%	43.66%	38.24%	24.00%	0.00%	11.76%	50.00%	66.67%	50.00%
Neutral	41.18%	25.35%	38.24%	28.00%	50.00%	23.53%	50.00%	0.00%	40.00%
Unsatisfied	23.53%	9.86%	8.82%	34.00%	0.00%	41.18%	0.00%	25.00%	10.00%
Very unsatisfied	5.88%	8.45%	5.88%	6.00%	50.00%	23.53%	0.00%	0.00%	0.00%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Internet Reliability

Figure 37 and Table 37 present the reliability of the respondents' Internet connection. The top answer is similar to the internet speed question, which is reliable with 39.63% respondents selected. The secondd highest answer is unreliable, which is 23.04%. The third one is similar to the second, which is 22.12%. The total combination of unsatisfied and very unsatisfied selection from the respondents is similar to the last question, which is 26.73%.

For a further review of the result, the region is used to break down the data into further detail. According to Figure 38 and Table 38, just as the internet speed results, Taranaki is the region with most respondents unsatisfied with their Internet reliability (58.83%). Gisborne is the most unsatisfied (100%). However, as mentioned before, there are only two respondents from this region, the result is not representative of the demographic. Therefore, Taranaki would require more attention to the Internet connection issue.

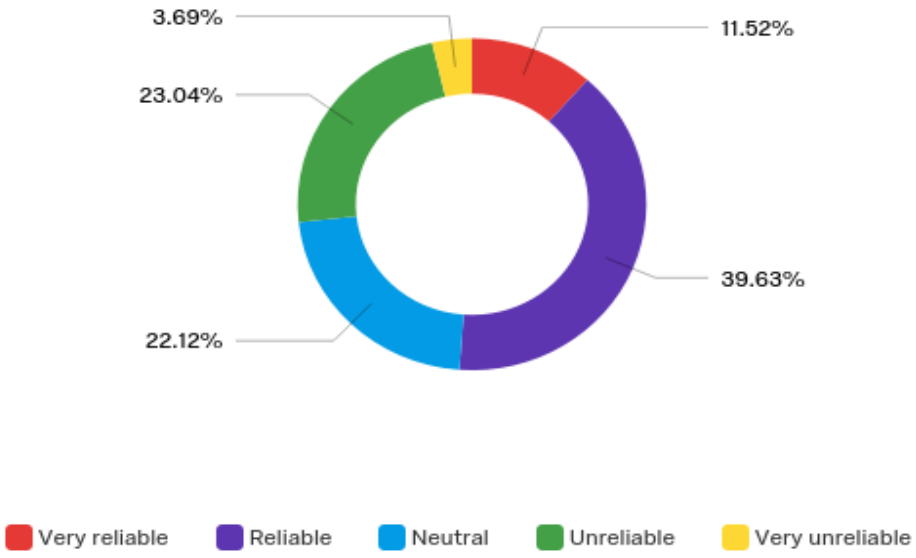


Figure 37 - Internet connection reliability

Table 37 – Internet connection reliability

Answer	Percentage	Count
Very reliable	11.52%	25
Reliable	39.63%	86
Neutral	22.12%	48
Unreliable	23.04%	50
Very unreliable	3.69%	8
Total	100%	217

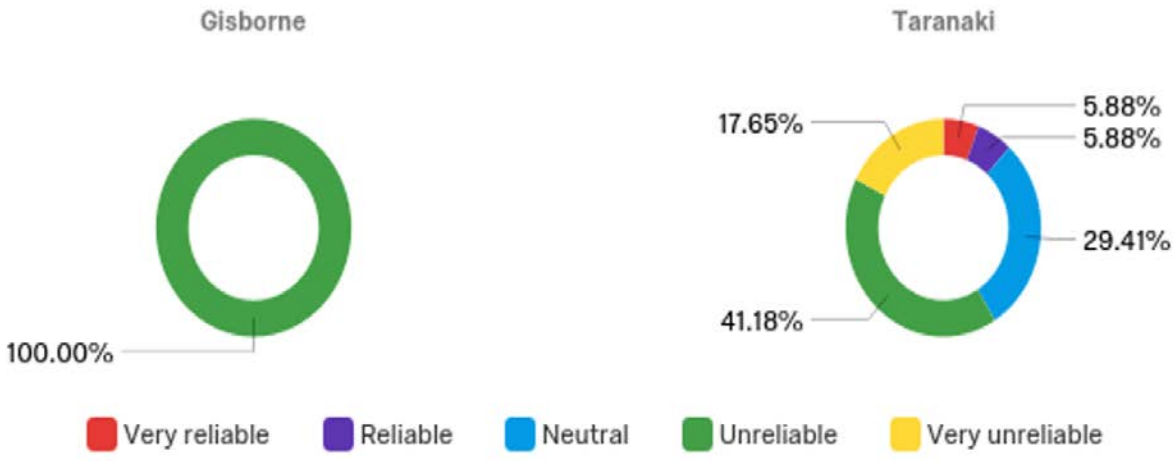


Figure 38 - Internet reliability vs. Region

Table 38 - Internet reliability vs. Region

Question	Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Taranaki	Manawatu-Wanganui	Hawkes Bay	Wellington
Very reliable	11.76%	18.31%	5.88%	8.00%	0.00%	5.88%	50.00%	8.33%	0.00%
Reliable	35.29%	42.25%	41.18%	38.00%	0.00%	5.88%	0.00%	66.67%	80.00%
Neutral	17.65%	25.35%	26.47%	24.00%	0.00%	29.41%	50.00%	0.00%	0.00%
Unreliable	35.29%	9.86%	23.53%	30.00%	100.00%	41.18%	0.00%	16.67%	20.00%
Very unreliable	0.00%	4.23%	2.94%	0.00%	0.00%	17.65%	0.00%	8.33%	0.00%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Opinions on Rural Broadband Usage

In addition to the above single- and multi- choices questions, the last open-ended question, "Any wishes, comments, complains or feedback regarding your Internet?" has been set to invite different opinions. Here below we list a few:

"Provide more cloud training."
"5-8pm lost connection due to peak hours."
"Want more reliable information (should learn how and where to find reliable info)."
"Improve speed/ get Fibre."
"Require more Internet coverage."
"3:15 pm connection down due to student home."
"Expensive."
"Weather affects the connection reliability."
"Required training/course for Internet and computer skill."
"Frequent disconnection on the Internet."
"The disconnection affects the Airbnb business, cause double booking."
"Internet only cover 1000 miles south island somewhere, nothing at all outside of that."

"Expensive, slow, and affected by the weather."
"Further rural areas lack affordable Internet."
"Have one less problem when switching from Spark to Vodafone."

It needs to be highlighted that this survey was undertaken from a down-to-earth, grassroots perspective with a face to face meeting of people to survey, hence noting their comments below that are not included anywhere else in this report.

There is a markedly low incidence of elderly participants in this survey, which we believe is due to low exposure over previous years, and perhaps the perceived "overwhelming" effect the new technology had on this demographic at the time. The same might be said of the reduced number of female respondents. It may be a case of another member of the family completing the survey, which is common in rural areas where the workloads of farm-life are shared.

Unexpectedly, many respondents stated they were eager to complete the survey stating they wished to complain about their connection, however in the results, the opposite is true, showing a certain degree of satisfaction.

The overall level of responses is low, despite being enticed by offered prizes. This displays a level of disinterest which was echoed in comments such as "we just have to wait for it to get better". There were also comments of "fiber costs too much" and "we will never have a faster Internet" when approaching people to participate in the survey.

The issue of cost needs to be addressed in further studies. Current broadband charges are deemed by the providers as being affordable while the current rural communities commented as being too costly. Does higher quality equal higher chargers? It seems many rural residents believe so. Farmers, in particular, were concerned by this, where they are often asset rich and cash-flow poor.

One case in point is a female who lives in Kumeu, North-West Auckland. She recalls having dial-up access 20 years ago, and then the day she was able to have ADSL. She said this was life-changing, as she could be looking at news and articles online, and still be able to take a phone call from her husband who was working overseas. Kumeu is one area of outer Auckland that used to be considered rural. It is now connected by housing and retailers all the way to Huapai and beyond. However, the availability of fibre is restricted to those very close to the township. This respondent, in particular, is still frustrated with current services even though she lives only 3km away. This expansion of faster access across areas like Kumeu is important because the population is increasing at an exponential rate and connectivity will be imperative.

The above points illustrate the changing attitudes and requirements of the rural community.

CHAPTER V: CONCLUSION

Survey Findings

The majority of the Internet usage is seeking basic information and news, online entertainment and banking. There is still a high proportion of respondents who are unsure how else the Internet can help them in improving their work efficiency (e.g., Cloud applications) and business development (e.g., marketing campaign on the Internet). A summary of the survey results is as follows.

Key findings

- The largest group (38.43%) of the respondents spend 3 to 5 hours daily on the Internet, and the second largest group (20.83%) spend over 8 hours daily. The respondents who are in the younger age group tend to spend more hours on the Internet. The group spending over 8 hours daily can be broken down by age into 16-29 (39.13%), 30-44 (20.37%), 45-59 (16.92%), and 60-69 (11.11%), with none 70 or above. This trend is similar for the 6-7 hour range. In the 3-5 hour range, 30-44 and 45-59 age groups are the main contributors (61.45%) while for the 1-2 hour range, 45-59 and 60-69 constitute the most significant groups (71.79%). Finally, the 70+ age group is the main contributor to the less than 1-hour range (36.36%).
- In relation to daily Internet usage, the majority use the Internet to check email (85.24%), read the news (67.59%), search for information (62.04%), surf the web (71.96%); visit social networking websites (61.86%), and instant messaging (63.55%). Entertainment-related Internet usage includes watching TV (36.41%), viewing images (29.30%), listening to music online (27.44%), and looking up funny contents (24.88%). However, very few use the Internet for business and other work-related matters such as selling online - only 2.8% daily and 8.88% weekly. Travel booking is about 4.17% daily, and comparing the prices of products or services online is about 10.08%.
- The online shopping (4.15% daily and 17.05% weekly) is double of the online selling activities, the top percentage on selling is at less than once a month rate (39.25%), and online shopping is at a monthly rate (35.48%). This can imply the majority of the respondents are not using the Internet for business purpose.
- 34.56% of the respondents do not use Cloud services. Among these respondents, 41.33% do not know how to use the Cloud, and 32% are unsure how Cloud technology can be useful in their everyday life.
- For those respondents using Cloud services, 75.45% use essential online Cloud storage. 50.91% have been using file sharing. However, only 31.82% using Cloud services (Cloud Applications) that is more complicated and designed for business purposes. In this group, 85.71% are employed, and the remainder is students.

- 70.83% of the respondents have never received any form of instructional or educational lessons on how to use the Internet properly. For those respondents who have had lessons, 35.94% of respondents are received them from their knowledgeable family members/friend, and 29.69% are self-taught at home. Moreover, when asking these respondents if they are interested in learning more ways to make better use of the Internet, the majority answers are neutral (40.63%), which implies that they are not sure what additional benefits they can get from having these instructions.
- The results of this rural broadband usage survey (RBUS) indicate that about 50% of the respondents are satisfied with the speed and the reliability of their Internet connections offered by RBI stage I. However, around 27% of the respondents are still dissatisfied with their Internet speed and connection reliability.

Findings on Devices

- Most of the respondents use their mobile phones (90.28%) and their laptops (70.83%) to access the Internet.
- Those accessing the Internet at home most commonly use portable devices. The top three devices are a mobile phone (93.06%), laptop (75%), and tablet (49.07%). For those accessing the Internet at locations other than their homes (e.g., library, workplace, cafe), about 22.22% of the respondents use a desktop.
- In relation to online shopping, respondents favour using mobile phone or tablet devices. The daily and weekly usage on mobile/tablet online shopping are double to purchase things online options.

Findings on Internet usage

- For the reasons of not using Cloud services, the female respondents tend to have more none technical reasons such as “Don’t know how to use it” (76.67% of this answer group). On the other hand, the male respondents reply with more technical reasons, such as privacy (83.33%), security (75%).
- There are 66.67% of male and 27.27% of female are using the File sharing service On Cloud usage. For the Cloud Application, male respondents’ count (65.71%) is also double of the female respondents’ count (28.57%). The percentage of male and female respondents using Cloud storage is roughly equal.
- When asking about the activities the respondents would like to do more on the Internet, the second top answer is “don’t know/prefer not to answer” (17.92%). This can imply they are unsure what else the Internet can do for them.
- The cross table of business activities usage and industry categories imply that most of the respondents are not using the Internet to sell their products, especially the Retail industry. However, they do use the Internet for the product marketing researches.

Findings on Skill and Knowledge on Internet

- There are total 78.34% of the respondents rate themselves as having a good ability for using the Internet. However, there are 70.83% of the respondents have never received the lessons on how to use the Internet before. There are 48.97% of the respondents' margin on these two results, which imply these respondents have never received the course, but are very confident in using the Internet.
- For those who have taken the course on Internet skill, there are 29.69% of respondents were self-taught (e.g., free online learning resources) at home. Among these respondents, female out-numbers male by 2 to 1.

Findings on Internet connection user experiences

- In the satisfaction evaluation of Internet speed and reliability. In Taranaki regions, more than half of the respondents are disappointed with their Internet connection (64.17% on speed and 58.83% on reliability).
- There are 80.88% of the respondents think the Internet is important or very important for their everyday life. This can imply the Internet is part of their life now. For example, use to go to the library for the information, now the Internet can be more efficient to achieve this.

The purpose of this report is to build upon and extrapolate from previous studies. Continued research is required to monitor progress on rural broadband usage and determine future upgrade requirements. The Internet, information age, and the people who use/depend upon it deserve a faster, more reliable service. As the amount of information on the Internet continues to become available, the demand for services will increase and connections have to be accessible. Studies need to be conducted every year to ensure the public is being provided with such.

REFERENCES

Blair, J., Czaja, R. F., & Blair, E. A. (2013). Designing surveys: A guide to decisions and procedures. Sage Publications.

Crothers, C., Smith, P., Urale, P. W. B., and Bell, A. (2016). The Internet in New Zealand 2015. Auckland, New Zealand: Institute of Culture, Discourse and Communication, Auckland University of Technology.

Díaz Andrade, A., Hedges, M.R., Karimikia, H. & Techatassanasoontorn, A. (2018). World Internet Project: The Internet in New Zealand 2017. New Zealand Work Research Institute, Auckland.

Elkhatib, Y., Tyson, G., & Sathiaseelan, A. (2015, August). Does the Internet deserve everybody? In Proceedings of the 2015 ACM SIGCOMM Workshop on Ethics in Networked Systems Research (pp. 5-8). ACM.

Grimmond, D., Bell, B., & Yap, M. (2014). Future capability needs for the primary industries in New Zealand. Ministry for Primary Industries. Retrieved from https://www.mpi.govt.nz/dmsdocument/3893/send

InternetNZ - About Us. (2018, February 6). [Non-profit]. Retrieved June 1, 2018, from https://internetnz.nz/about-us/internetnz-group

MBIE. (2016). Rural Broadband Initiative - Phase 1. Ministry of Business, Innovation and Employment. Retrieved from http://www.mbie.govt.nz/info-services/sectors-industries/technology-communications/fast-broadband/documents-image-library/rural-broadband-initiative/rural-broadband-initiative-phase-1-august-2016.pdf

NetHui (2017, November 8). Programme. Retrieved July 27, 2018, from https://2017.nethui.nz/programme/

Rohani, Mehrnaz and Lundberg, Robert (2016). Auckland rural broadband survey findings 2016. Auckland Council internal report, IR2016/005

The Download. (2016). Who are Rural Broadband Users? Tangible Media ICG Ltd, (2). Retrieved from http://thedownload.co.nz/media/9732/the-download2-lr.pdf

Villapol, M., Liu, W., Gutierrez, J. A., Chiaraviglio, L., Sathiaseelan, A., Wu, J.,& Gregory, M. A. (2017, November). Connecting the unconnected 10% of New Zealanders by 2025: Is a MahiTahi approach possible?. In Telecommunication Networks and Applications Conference (ITNAC), 2017 27th International (pp. 1-7). IEEE.

Appendix A – Ethics Approval

Appendix B - Presentation of Online Survey

Appendix C - Information Sheet

Appendix D – Poster

AUTEC Secretariat

Auckland University of Technology
D-88, WU406 Level 4 WU Building City Campus
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

1 February 2018

Jairo Gutierrez
Faculty of Design and Creative Technologies

Dear Jairo

Ethics Application: 18/23 **Current state of Broadband usage in rural communities (eBroadenMe)**

I wish to advise you that a subcommittee of the Auckland University of Technology Ethics Committee (AUTEC) has **approved** your ethics application.

This approval is for three years, expiring 31 January 2021.

Standard Conditions of Approval

1. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through http://www.aut.ac.nz/researchethics.
2. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through http://www.aut.ac.nz/researchethics.
3. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form: http://www.aut.ac.nz/researchethics.
4. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.

Non-Standard Conditions of Approval

1. Provision of advice in the Information Sheet that the project is being funded by Internet New Zealand.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Please quote the application number and title on all future correspondence related to this project.

AUTEC grants ethical approval only. If you require management approval for access for your research from another institution or organisation then you are responsible for obtaining it. You are reminded that it is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

For any enquiries please contact ethics@aut.ac.nz

Yours sincerely,

Kate O'Connor
Executive Manager
Auckland University of Technology Ethics Committee

Cc: louiefaundo@gmail.com; Edmund Lai; William Liu

Appendix B – Presentation of Online Survey

Page 1 (1/2) – Participant Information Sheet

By completing this questionnaire, you are indicating your consent to participate in this research

Participant Information Sheet

Date Information Sheet Produced:

04/12/2017

Project Title

Current State of Broadband Usage in Rural Communities (eBroadenMe)

An Invitation

You are invited to participate in our anonymous survey to get statistical data of the current state of broadband usage in rural communities. We are a group of students from Auckland University of Technology (AUT)that is doing research on the current state of broadband usage and knowledge gaps in rural communities in New Zealand. Your participation is voluntary, and you do not need to answer questions that you choose not to.

What is the purpose of this research?

- The purpose of this research is to understand how the communities in rural New Zealand are using the faster and improved internet connections that is made possible by the New Zealand Government.
- This research is a requirement for our Research and Development project to obtain our Bachelors in Computing and Information Sciences degree.
- The final deliverable includes a report on the usage and knowledge gaps, along with statistical results serving as a reference to inform those who wish to create, invest and take actions to speed the economic and social growth of rural communities through internet connectivity.

How was I identified and why am I being invited to participate in this research?

We have identified you as an individual from a rural area in New Zealand and is over the age of 16 or we have approached you in a public area to be invited to participate in our survey

How do I agree to participate in this research?

By completing the survey, you agree to participate in this research.

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage or disadvantage you.

What will happen in this research?

For this research, you will be completing a short survey (26 questions) about the way you use the internet. This research is part of the requirements needed by us, the researchers to complete our qualifications for our Bachelor's degree at AUT. Your answers will be very important in helping us identify the usage and knowledge gaps of internet users in the rural area. The data collected will be used to create a report and statistical results that will serve as reference to inform those who wish to create, invest and take actions to speed the economic and social growth of rural communities through internet connectivity. The survey may take 5 to 10 minutes to complete. You are also invited to enter the iPad draw as an incentive to do this survey, the entry details are collected separately and will not be linked to your survey answers.

What are the discomforts and risks and how will they be alleviated?

There are no foreseeable risks for your participation. Some questions on the survey may cause some minor discomfort. Again, you are reminded that this survey is anonymous. We will not be able to identify responses.

What are the benefits?

- This research is a requirement for us to complete our Bachelors in Computing and Information Sciences at Auckland University of Technology (AUT).

- Participating in this survey is a great chance for you, as an internet user in rural New Zealand, to help the study identify barriers such as usage and knowledge gaps that prevent more effective use of the internet.
- The wider community will benefit from the results of this research by having legitimate knowledge gaps identified and rural community experiences documented for which best practices can be recommended or designed in the future.

How will my privacy be protected?

The surveys are conducted anonymously and no personal information (name, address or other identifier) will be collected from participants. You may leave us your mobile number if you wish to participate in the iPad prize draw (the mobile number is collected separately and is not linked to the survey). We will not use any gathered information for any purpose outside of this research project.

What are the costs of participating in this research?

The survey takes 5-10 minutes of your time to complete

Will I receive feedback on the results of this research?

We will be posting the results of the research on our Facebook page: https://www.facebook.com/AUTRBURG/.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Jairo Gutierrez, Jairo.Gutierrez@aut.ac.nz, 09 921 9999 ext 5854

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, *ethics@aut.ac.nz* , 09 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Louie Faundo
Email: Vfs1378@autuni.ac.nz

Rory Knight
Email: Pgf4707@autuni.ac.nz

Khodesh Temita
Email: Wgw1595@autuni.ac.nz

Keli Liu
Email: Nvs5088@autuni.ac.nz

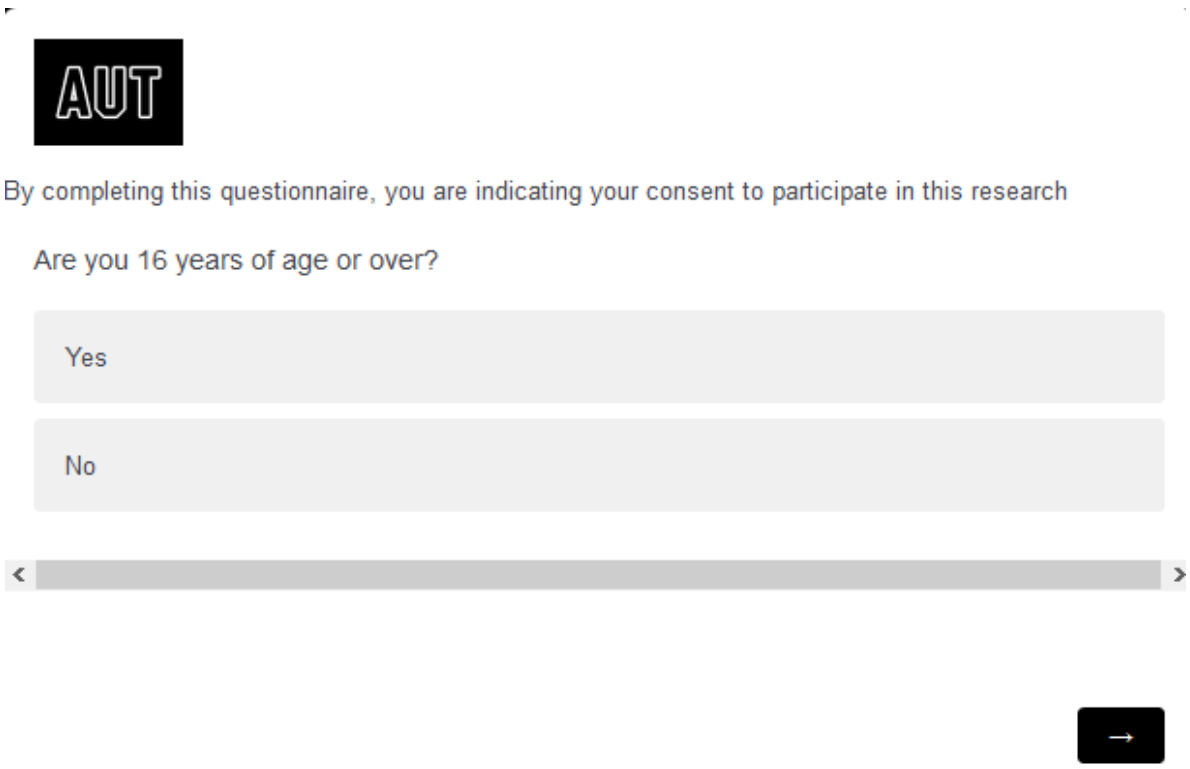
Chung But
Email: Mvq8106@autuni.ac.nz

Project Supervisor Contact Details:

Jairo Gutierrez, Deputy Head of School (Academic), Engineering, Computer and Mathematical Sciences
Phone: +64 9 921 9999 Ext. 5854
Email: Jairo.Gutierrez@aut.ac.nz
Physical address:
School of Engineering, Computer and Mathematical Sciences
WT Building, Level 1
2-14 Wakefield Street
Auckland

Approved by the Auckland University of Technology Ethics Committee on 1/02/2018, AUTEC Reference number 18/23.

Page 2- Age confirmation



By completing this questionnaire, you are indicating your consent to participate in this research

How often do you actively use the internet?

- Over 8 Hours a day
- 6-7 Hours a day
- 3-5 Hours a day
- 1-2 Hours a day
- Less than one hour a day

What devices have you used in the past from any location to connect to the internet? (Please select all that applies)

- Desktop Computer
- Laptop
- Smart/Mobile Phone
- Tablet
- Gaming console
- Other devices:

Page 3 (2/3) – Survey questionnaire

Which of the following devices do you have in your household? (Please select all that applies)

- Desktop Computer
- Laptop
- Mobile/Smart Phone
- Tablet
- Gaming Console
- Other device:

Which internet service provider are you currently with?

- Vodafone
- Spark
- 2 Degrees
- Bigpipe
- Compass
- Flip
- My Republic
- Orcon
- Skinny
- Slingshot
- Stuff Fibre
- Wireless Nation
- Other provider (Please specify)
- Don't know/Unsure

Page 3 (3/3) – Survey questionnaire

What internet connection is your household using?

- ADSL/VDSL broadband
- Fibre connection (Ultra Fast Broadband)
- Rural Wireless Broadband
- 4G or Mobile Internet (tethering/ Mobile Hotspot)
- Satellite Broadband (requires satellite dish)
- Dial-up
- Other (please specify) :
- Don't know/Unsure

Do you use the Cloud?

- Yes
- No
- Unsure

By completing this questionnaire, you are indicating your consent to participate in this research

How important is the internet to your everyday life?

- Very important
- Important
- Moderately Important
- Of Little Importance
- Unimportant

How would you rate your ability to use the internet?

- Excellent
- Good
- Neutral
- Poor
- Unskilled

Page 4 (2/5) – Survey questionnaire

How important is each of the following as a source of information to you?

	Very Important	Important	Moderately Important	Of little Importance	Unimportant
Internet	○	○	○	○	○
TV	○	○	○	○	○
Radio	○	○	○	○	○
Newspaper	○	○	○	○	○

In your own opinion, how reliable is the information on the internet?

- Very reliable
- Reliable
- Neutral
- Unreliable
- Very unreliable

How often do you use the internet for the following purposes?

	Daily	Weekly	Monthly	Less than once a month	Never
Looking for news	○	○	○	○	○
Looking for job/work	○	○	○	○	○
Looking for humorous/funny content	○	○	○	○	○
Looking for images	○	○	○	○	○
Using a search engine to get information	○	○	○	○	○
Using for navigation	○	○	○	○	○
Looking for facts	○	○	○	○	○
Looking for word definitions	○	○	○	○	○
Looking for information for school/university	○	○	○	○	○
Looking for business opening hours (food places, restaurants, attractions etc.)	○	○	○	○	○

How often do you use the internet for the following purposes?

	Daily	Weekly	Monthly	Less than once a month	Never
Surf/browse the web	○	○	○	○	○
Visit social networking websites (Facebook, Twitter, Myspace etc.)	○	○	○	○	○
Watch TV shows online (Netflix, On demand, etc.)	○	○	○	○	○
Watch/download films from the internet	○	○	○	○	○
Look at sites with sexual content	○	○	○	○	○
Download/listen to music online	○	○	○	○	○
Download/watch videos online (not including TV shows or movies)	○	○	○	○	○
Play online games	○	○	○	○	○
Listen to radio online	○	○	○	○	○
Look at religious/spiritual websites	○	○	○	○	○
Bet/gamble online	○	○	○	○	○

Which, if any, would you like to do more of on the internet?

- Use government or council services
- Entertainment
- Education
- News
- Shopping
- Social networking
- Blogging/posting own content
- Look for information
- Gaming
- Don't know/ Prefer not to answer

How often do you do the following?

	Daily	Weekly	Monthly	Less than once a month	Never
Check email	○	○	○	○	○
Use instant messenger	○	○	○	○	○
Post on social networking sites (Facebook, Twitter etc.)	○	○	○	○	○
Repost/share links or content created by other users	○	○	○	○	○
Make/receive phone calls over the Internet (Skype, Facebook calling etc.)	○	○	○	○	○
Post messages/comments on discussion boards or forums (reddit, 4chan etc.)	○	○	○	○	○
Post own content that you created	○	○	○	○	○
Upload music or music videos	○	○	○	○	○

How frequently do you use the following?

	Daily	Weekly	Monthly	Less than once a month	Never
Get information about a product online	○	○	○	○	○
Compare prices of product/services online	○	○	○	○	○
Make travel reservations or bookings	○	○	○	○	○
Buy things online	○	○	○	○	○
Sell things online	○	○	○	○	○
Use online bank services	○	○	○	○	○
Pay bills	○	○	○	○	○
Use smartphone or tablet to make purchase of any kind	○	○	○	○	○

Page 4 (5/5) – Survey questionnaire

How Satisfied are you with the speed of the internet at your home?

- Very satisfied
- Satisfied
- Neutral
- Unsatisfied
- Very unsatisfied

How reliable is the internet at your home?

- Very reliable
- Reliable
- Neutral
- Unreliable
- Very unreliable

Have you ever received instructional/educational lessons on how to use the internet?

- Yes
- No

→

By completing this questionnaire, you are indicating your consent to participate in this research

If yes, did you find the lessons useful?

- Very useful
- Useful
- Neutral
- Not useful
- Not useful at all

How interested are you in learning more ways to make better use of the internet?

- Very Interested
- Interested
- Neutral
- Not Interested
- Very Uninterested

Where/How did you get lessons on how to use the internet?

- At home/ self taught
- Lessons from knowledgeable family/friend
- Place of employement
- Paid services/ Upskilling session
- Education provider/ school, university
- Other

Page 5 (2/3) – Survey questionnaire

What is your age group?

16-29

30-44

45-59

60-69

70+

Gender

Male

Female

Gender Diverse (please specify)

Ethnicity

Maori

Pacific People

Asian

European

Middle Eastern

Latin American

African

Other Ethnicy

Page 5 (3/3) – Survey questionnaire

Region

- Northland
- Auckland
- Waikato
- Bay of Plenty
- Gisborne
- Taranaki
- Manawatu-Wanganui
- Hawkes Bay
- Wellington
- South Island

What is your current employment status?

- Employed (Full time, part time, etc.)
- Unemployed
- Student
- Retired
- Home-maker
- Unable to work

Page 6 Survey questionnaire

By completing this questionnaire, you are indicating your consent to participate in this research

Any wishes, comments, complaints, or feedback regarding your internet? (Optional)

By completing this questionnaire, you are indicating your consent to participate in this research

We thank you for your time spent taking this survey.
Your response has been recorded .

To join the prize draw for a brand new Apple iPad,
Click Here!

Participant Information Sheet

Date Information Sheet Produced:

04/12/2017

Project Title

Current State of Broadband Usage in Rural Communities (eBroadenMe)

An Invitation

You are invited to participate in our anonymous survey to get statistical data of the current state of broadband usage in rural communities. We are a group of students from Auckland University of Technology (AUT)that is doing research on the current state of broadband usage and knowledge gaps in rural communities in New Zealand. Your participation is voluntary, and you do not need to answer questions that you choose not to.

What is the purpose of this research?

- The purpose of this research is to understand how the communities in rural New Zealand are using the faster and improved internet connections that is made possible by the New Zealand Government.
- This research is a requirement for our Research and Development project to obtain our Bachelors in Computing and Information Sciences degree.
- The final deliverable includes a report on the usage and knowledge gaps, along with statistical results serving as a reference to inform those who wish to create, invest and take actions to speed the economic and social growth of rural communities through internet connectivity.

How was I identified and why am I being invited to participate in this research?

We have identified you as an individual from a rural area in New Zealand and is over the age of 16 or we have approached you in a public area to be invited to participate in our survey

How do I agree to participate in this research?

By completing the survey, you agree to participate in this research.

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage or disadvantage you.

What will happen in this research?

For this research, you will be completing a short survey (26 questions) about the way you use the internet. This research is part of the requirements needed by us, the researchers to complete our qualifications for our Bachelor's degree at AUT. Your answers will be very important in helping us identify the usage and knowledge gaps of internet users in the rural area. The data collected will be used to create a report and statistical results that will serve as reference to inform those who wish to create, invest and take actions to speed the economic and social growth of rural communities through internet connectivity. The survey may take 5 to 10 minutes to complete. You are also invited to enter the iPad draw as an incentive to do this survey, the entry details are collected separately and will not be linked to your survey answers.

What are the discomforts and risks and how will they be alleviated?

There are no foreseeable risks for your participation. Some questions on the survey may cause some minor discomfort. Again, you are reminded that this survey is anonymous. We will not be able to identify responses.

What are the benefits?

- This research is a requirement for us to complete our Bachelors in Computing and Information Sciences at Auckland University of Technology (AUT).

- Participating in this survey is a great chance for you, as an internet user in rural New Zealand, to help the study identify barriers such as usage and knowledge gaps that prevent more effective use of the internet.
- The wider community will benefit from the results of this research by having legitimate knowledge gaps identified and rural community experiences documented for which best practices can be recommended or designed in the future.

How will my privacy be protected?

The surveys are conducted anonymously and no personal information (name, address or other identifier) will be collected from participants. You may leave us your mobile number if you wish to participate in the iPad prize draw (the mobile number is collected separately and is not linked to the survey). We will not use any gathered information for any purpose outside of this research project.

What are the costs of participating in this research?

The survey takes 5-10 minutes of your time to complete

Will I receive feedback on the results of this research?

We will be posting the results of the research on our Facebook page: https://www.facebook.com/AUTRBURG/.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Jairo Gutierrez, Jairo.Gutierrez@aut.ac.nz, 09 921 9999 ext 5854

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, *ethics@aut.ac.nz* , 09 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Louie Faundo
Email: Vfs1378@autuni.ac.nz

Rory Knight
Email: Pgf4707@autuni.ac.nz

Khodesh Temita
Email: Wgw1595@autuni.ac.nz

Keli Liu
Email: Nvs5088@autuni.ac.nz

Chung But
Email: Mvq8106@autuni.ac.nz

Project Supervisor Contact Details:

Jairo Gutierrez, Deputy Head of School (Academic), Engineering, Computer and Mathematical Sciences
Phone: +64 9 921 9999 Ext. 5854
Email: Jairo.Gutierrez@aut.ac.nz
Physical address:
School of Engineering, Computer and Mathematical Sciences
WT Building, Level 1
2-14 Wakefield Street
Auckland

Approved by the Auckland University of Technology Ethics Committee on 1/02/2018, AUTEC Reference number 18/23.

Rural Broadband Usage

Understanding Rural Communities Broadband Usage

Staff Members: William Liu, Edmund M-K Lai, Jairo Gutierrez, Ming Xiang
Student Members: Louie Faundo, Rory Knight, Chung But, Keli Liu

Project Purpose

The purpose of this project is to understand how the communities in rural New Zealand are using the faster and improved internet connections that are being made possible by the New Zealand government. This project will help those rural communities make improved use of the faster internet speeds that are already available to them. Our aim is to identify the factors that may hinder them from fully utilising the internet such as gaps in knowledge, technological challenges, and other barriers. We also intend to identify some best practices that can be shared among the rural communities to positively influence the hindering factors.

Background

- With stage 1 of the rural broadband initiative completed, 90% of rural households have at least 5 Mbps broadband connection. Schools have access to fibre broadband. With the internet improvement we can see a change in the lifestyle of our country's rural residents.

- People from the rural areas such as teachers still feel that they are not well equipped to make use of the educational opportunities provided by the faster internet connections. Farmers, according to a KPMG Consulting report are reluctant to change the practices they have used for the last 20 years. (TheDownload)

Objectives

In order to help the rural communities make better use of the better internet connections available, we need to have an understanding of how they use the internet at the moment.

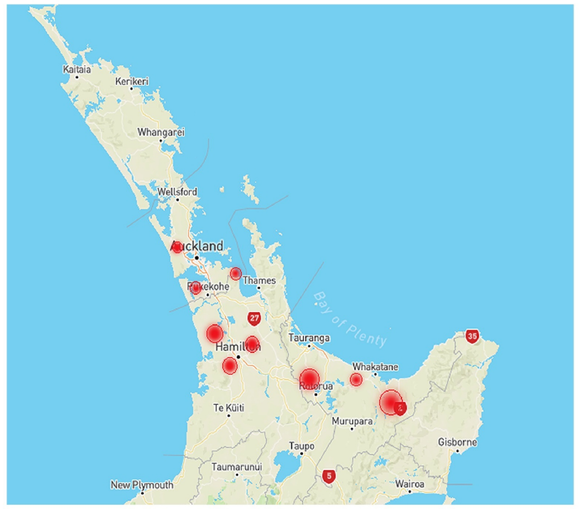
- By conducting an observational survey, we can identify how the people from rural communities use the internet and identify the main activities they do on the internet.

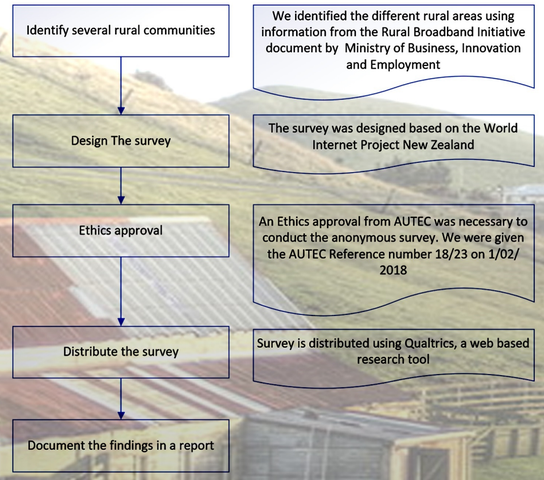
- We also hope to identify some practices that can be shared among these communities.

- The information provided at the end of the survey as well as the information gathered from talking to the rural residents could be used to target appropriate training, suggestions and other products for this group of people.

Background Image Credit: Ville Miettinen

Process & Methods





Participants are identified as individuals from the rural areas in New Zealand and are over the age of 16. We have approached the participants in a public area to complete the survey on a tablet or they are provided a short link to complete the survey at their own time.

What Went Well

- We stayed with 4 farmstays on our travel and we were able to experience using the internet in rural areas.
- Face to face surveys and conversations helped us capture participants wishes, comments, complaints and feedback with their internet connection

Survey Results

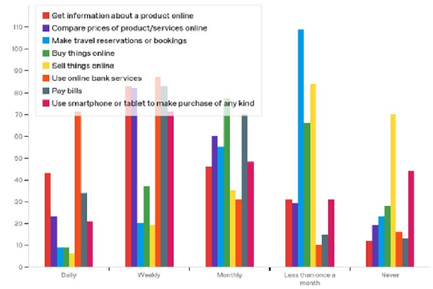


Figure 1 - The online shopping (4.15% daily and 17.05% weekly) is double of the online selling activities, the top percentage on selling is at less than once a month rate (39.25%), and online shopping is at a monthly rate (35.48%). This can imply the majority of the respondents are not using the Internet for business purpose.

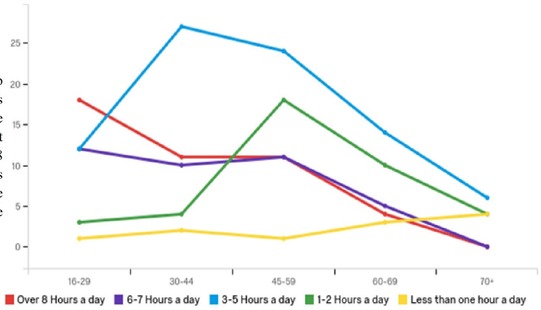


Figure 2 - The largest group (38.43%) of the respondents spend 3 to 5 hours daily on the Internet, and the second largest group (20.83%) spend over 8 hours daily. The respondents who are in the younger age group trend to spend more hours on the Internet.

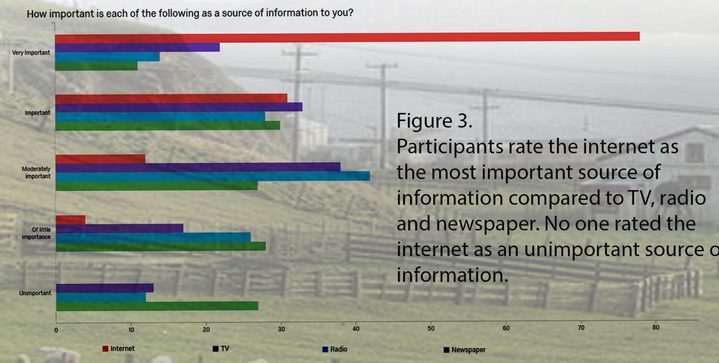


Figure 3.
Participants rate the internet as the most important source of information compared to TV, radio and newspaper. No one rated the internet as an unimportant source of information.

More Results Are Available Upon Request

Participant Feedback

- *"Copper or 4g only, no fibre rollout planned, rural communities left in the dark. 4g data plans too low/expensive."*
- *"We wish for cheaper internet connection."*
- *"Make broadband cheaper because it's certainly not fast for the monthly payments we make."*
- *"Internet here is s***. Wish we can get faster connections"*

Based on most of the participant feedback, recurrent themes from rural areas are wishes for more competitive options and faster internet connection options which balance price and speed.

Survey Findings

Key Findings

- In relation to daily Internet usage, the majority use the Internet to check email (85.24%), read the news (67.59%), search for information (62.04%), surf the web (71.96%); visit social networking websites (61.86%), and instant messaging (63.55%). Entertainment-related Internet usage includes watching TV (36.41%), viewing images (29.30%), listening to music online (27.44%), and looking up funny contents (24.88%).
- 34.56% of the respondents do not use Cloud services. Among these respondents, 41.33% do not know how to use the Cloud, and 32% are unsure how Cloud technology can be useful in their everyday life.
- For those respondents using Cloud services, 75.45% use essential online Cloud storage. 50.91% have been using file sharing. However, only 31.82% using Cloud services (Cloud Applications) that is more complicated and designed for business purposes. In this group, 85.71% are employed, and the remainder are students.
- 70.83% of the respondents have never received any form of instructional or educational lessons on how to use the Internet properly. For those respondents who have had lessons, 35.94% of respondents are received them from their knowledgeable family members/friend, and 29.69% are self-taught at home.
- The results of this rural broadband usage survey (RBUS) indicate that about 50% of the respondents are satisfied with the speed and the reliability of their Internet connections offered by RBI stage I. However, around 27% of the respondents are still dissatisfied with their Internet speed and connection reliability.

Other Findings

- Most of the respondents use their mobile phones (90.28%) and their laptops (70.83%) to access the Internet.
- In the satisfaction evaluation of Internet speed and reliability. In Taranaki regions, more than half of the respondents are disappointed with their Internet connection (64.17% on speed and 58.83% on reliability).
- There are 80.88% of the respondents think the Internet is important or very important for their everyday life. This can imply the Internet is part of their life now. For example, use to go to the library for the information, now the Internet can be more efficient to achieve this.

References

FluidSurveys Team. (2014, June 3). 3 Types of Survey Research, When to Use Them, and How they Can Benefit Your Organization!. Retrieved June 03, 2018, from http://fluidsurveys.com/university/3-types-survey-research-use-can-benefit-organization/

Ministry of Business, Innovation & Employment. (2016). Rural Broadband Initiative Phase 1. Retrieved from http://www.mbie.govt.nz/info-services/sectors-industries/technology-communications/fast-broadband/documents-image-library/rural-broadband-initiative/rural-broadband-initiative-phase-1-august-2016.pdf

Chorus. (2016).The Download Championing better broadband for New Zealand. Retrieved from http://thedownload.co.nz/media/9732/the-download2-lr.pdf

Charles, C., Philippa, S., Poutasi, W. B. U., & Allan, B. (2015).World Internet Project New Zealand The Internet in New Zealand 2015. Retrieved from https://workresearch.aut.ac.nz/__data/assets/pdf_file/0003/71328/WIPNZ-Report-060515.pdf