A Report on the Findings of the Eight Questions from the *Te Aka Māori-English, English-Māori Dictionary* Online Pop-Up Survey – a commissioned work by Te Taura Whiri i te Reo Māori

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Key Findings

1.0 This report provides an analysis of some of the data collected through an online pop-up survey administered on the *Te Aka Māori-English, English-Māori Dictionary* online and the *Te Reo Māori* dictionary app. It reports on the key findings on eight questions related to: who is using the dictionary (i.e. ethnic groups, age groups, language ability groups); what the dictionary is being used for; attitudes to making Māori language compulsory in New Zealand primary schools; and whether Māori language is an important part of New Zealand's national identity. 5,391 completed surveys were used for analysis with a response rate of 28.6%. Descriptive frequency and cross tabulations and means analysis were generated to examine the data.

2.0 As expected, results from the survey show that the most frequently chosen reason for using the *Te Aka* and/or the *Te Reo Māori* dictionary app is for help in finding the meanings of new words. 84.7% of respondents included this as one of the reasons for accessing a digital form of the dictionary. This was the main reason for using the dictionary for all age groups and all levels of ability.

3.0 The second most important reason for using the digital dictionary is to find how to use a Māori word in a sentence. Nearly half of the users (48.6%) use the digital dictionary for this purpose, with the beginner and intermediate level learners having the highest percentage of their number using the dictionary for this purpose. This result shows that example sentences are being used to help improve users' Māori language ability.

4.0 Over half the respondents use the dictionary for helping them write the language (56.1%), and for learning the grammar of the language (55.5%). Using the dictionary for understanding (47.3%), for reading comprehension (46.4%), and for speaking (46.2%) is useful for just under half of the respondents.

5.0 It is obvious from these results that for many learners and speakers of Māori, *Te Aka* serves a much greater function than to just look up the meaning of Māori words, or to find equivalents of a word in one language for a word, or words, in the other. Of the five ability groups identified, the intermediate, advanced and beginner groups show the highest proportions using *Te Aka* to develop their language skills.

6.0 The findings of the survey showed an unexpected correlation between Pākehā and Māori respondents in that both samples of respondents agree that the Māori language should be made compulsory in New Zealand primary schools. Māori showed the highest rating in either agree or strongly agree with 83.4%. Pākehā respondents followed closely behind with 80.2% either agreeing or strongly agreeing.

7.0   Both Pākehā (93.8%) and Māori (94.6%) respondents agree and strongly agree that Māori language is an important part of New Zealand's national identity and that there appears to be a significant relationship between te reo Māori and our national identity.

8.0   The report provides a brief discussion of some studies related to the use of new technologies and digital media for language revitalisation. There is also an overview of the development and key features of the *Te Aka* online dictionary, and some of the main advantages that digital dictionaries have over printed hard copy dictionaries in making te reo Māori accessible to learners and speakers of the language.

9.0   The popularity of the online dictionary is reflected in *Te Aka* Google Analytics statistics. For the year ending 22 June 2016, the website had received 3,485,800 visits from 224 countries. Of those, 1,397,353 were unique visitors. This is a 27.75% increase on the previous year and follows a similar percentage increase since the online dictionary was launched in December 2006. Further details show that 3,015,800 (86.51%) of the visits to the website were from Aotearoa/New Zealand, with over 1 million (1,027,477) unique users from this country.

10.0   The daily usage of the website each year peaks on the days of Māori Language Week, showing the value of this promotion of the language. Although the number of visits drops back after Māori Language Week, the interesting feature is that the number of visits each day rarely drops below the levels in the weeks prior to Māori Language Week or to the numbers of the same period for the previous year. This provides further strong evidence for the interest and continuing benefits to the Māori language of its promotion during Māori Language Week.

Chapter One: Introduction

Introduction

The purpose of this report is to provide an analysis of the data collected through an online pop-up survey administered on the *Te Aka Māori-English, English-Māori Dictionary* online (*Te Aka*) and to report key findings on eight of the 18 questions as identified by Te Taura Whiri i te Reo Māori.

Brief description of project:

Te Taura Whiri i te Reo Māori and Te Puni Kōkiri are to monitor two headline indicators of the Māori Language Strategy. As a result, Te Taura Whiri i te Reo Māori has been tasked with undertaking a survey of the attitudes of all New Zealanders towards te reo Māori. Initial investigations identified a number of existing surveys were capturing data relating to attitudes and it is these existing surveys that Te Taura Whiri i te Reo Māori is seeking feedback on regarding the findings in order to identify if there are any further areas to investigate in more depth which necessitates conducting a 'stand-alone attitude' survey.

The pop-up survey of 18 questions on the *Te Aka* website collected rich information about the users, including how often they use the site, for what purpose and feedback on the use of digital technology in the preservation of the Māori language. Te Taura Whiri i te Reo Māori is interested in the findings from the following eight questions from the pop-up survey listed below:

1. For what purpose are you using *Te Aka and/or the Te Reo Māori app?*
2. Which ethnic group do you belong to?
4. What year were you born?
7. In which language[s] could you hold a conversation about a lot of everyday things?
8. Rate your ability in the Māori language.
9. How is *Te Aka and/or the Te Reo Māori app* helping you to learn the Māori language?
13. How do you feel about the Māori language being compulsory in New Zealand primary schools?
14. Do you think the Māori language is an important part of New Zealand's national identity?

Aim of this research

The development of the online version of the *Te Aka Māori-English, English-Māori Dictionary* (see www.maoridictionary.co.nz) and the decision that it would be free and accessible anywhere in the world as a valuable tool for Māori language learners and speakers has been spectacularly successful in

attracting users world-wide. This is the most comprehensive and popular online Māori language dictionary on the Internet. For the year ending 22 June 2016, the website had received: 3,485,800 visits from 224 countries (*Te Aka* Google Analytics, n.d.). There were 1,397,353 unique visitors. These figures show the potential for online dictionaries to increase the accessibility of a dictionary as a resource. However, an investigation into the users of the online dictionary enables the research team to understand how useful the online resource is in language revitalisation and to understand more about the profiles of the users.

Background and purpose of the research

The Māori language is at the heart of Māori development. Te Ipukarea is involved in the revitalisation of the Māori language and is committed to undertaking research and related revitalisation projects to ensure that te reo Māori, a minoritised and endangered language, survives. Such research is located at the frontier of new knowledge that is beginning to be shared internationally in forums, including the United Nations, where Māori and other endangered languages are discussed, such as The Universal Declaration of Human Rights–General Assembly of the United Nations, December 10 1948, The Kari-Oca Declaration entitled 'Indigenous Peoples' Earth Charter (May 1993), and the Declaration on the Rights of Indigenous People 2007. Not only is there significant ignorance about what is lost when a language dies; it is likely that the majority of people, even those passionate about language revival, are not fully aware of how dramatic the rate of language loss is globally:

> In the year 2001, at least 6912 distinct human languages were spoken worldwide. Many linguists now predict that by the end of our current 21st century – the year 2101, only about half of these languages may still be spoken… At the current pace, we stand to lose a language about every 10 days for the foreseeable future (Harrison 2007, pp.3-5).

> The accelerating extinction of languages on a global scale has no precedent in human history… Languages are far more threatened than birds (11% threatened, endangered, or extinct), mammals (18%), fish (5%), or plants (8%) (Harrison 2007, p.7).

This serves to be of interest to those involved academically, politically and practically in Māori language revitalisation efforts and has the potential to foster a strong sense of awareness of the prevailing conditions and circumstances that constitute language endangerment. The Māori language defines us as the Indigenous people of Aotearoa/New Zealand and therefore this research, while examining the efficacy of technology as a tool for language revitalisation, will provide hard evidence of who is using the language, for what purpose, in what location and details of the demographics of the users using the *Te Aka*. This research will help us understand how the language is valued and by whom and the positive and distinctive contribution it is playing to the development of Aotearoa/New Zealand identity as a nation within a global context.

Over the years the use of technology, from the tape recorder to digital archiving, has been increasing, and is clearly useful, for the documentation and revitalisation of endangered and minoritised languages. At the same time, many endangered and minoritised languages appear to be making a successful transition to new media. We now know that, for minority and endangered languages, there is more material produced on the Internet than in the traditional print or mass media. Rather than being mere consumers of mass media conveyed in a dominant majority language, minority-language users can, through the Internet and new media, become producers as well as consumers of media products, in their own language. Questions, however, remain as to how technology and new media can be exploited in the following:

i   the teaching and learning of endangered and minoritised languages;
ii   the development of learning materials;
iii   the creation of new opportunities for endangered and minoritised languages, including economic opportunities in web development, etc.;
iv   the creation of new spaces for endangered and minoritised languages.

This project is innovative and cutting edge as it will provide detailed information on the users of the *Te Ak*a online dictionary and why they use the *Te Aka* digital resource.

Benefits of this research to the participants, the researchers, and the wider community

This research project will demonstrate excellence as it is innovative and evidence-based. It will show who, where and for what purpose users of *Te Aka* are utilising the digital resource, what functionalities should be added to improve the resource and how this resource is impacting on the preservation of the Māori language to make the language more mobile and accessible. It will provide information on attitudes of both Māori and non-Māori toward the language and ideas of how to increase accessibility. It will also provide a template for other minoritised and endangered languages seeking to measure the value of their languages through online resources.

Importantly, the users themselves will benefit from this research as the feedback they provide will help to improve the functionality of the online dictionary and app. Government agencies will also benefit from this research as it will provide greater insight into who is utilising the online Māori dictionary and its impact on Māori language revitalisation, and where this is occurring in the world. The research will also be of interest to academics and those involved in language revitalisation globally.

This research will help determine if and how technology through the *Te Aka* online dictionary is actually making an impact on the preservation of Māori language revitalisation. Online dictionaries have many advantages over hard copy print dictionaries and their accessibility on-line makes them valuable tools to support learners and speakers of the Māori language to improve their ability to express themselves clearly and accurately. However, there is little empirical evidence that this claim. Evidence taken from user responses to the pop-up survey will provide a detailed picture of their use of the online dictionary, the features they particularly like, what is missing and if the tool is supporting the revitalisation of the language.

Some of the advantages of an online dictionary over hard copy dictionaries are discussed in Chapter Three and in other publications (Duder, 2012; Keegan, Watson, King, Maclagan & Harlow 2012; Mato, 2012; Moorfield, 2012b). However, understanding more about the correlation between the user and the effectiveness of the tool, will help us measure the value of the digital resource and its benefit to the user in the preservation and revitalisation of the Māori language.

The research findings and outcomes will be made available through the Te Taura Whiri i te Reo Māori Research Portal and in part as a PDF for downloading from the Te Ipukarea website (see www.teipukarea.maori.nz).

Theoretical frameworks and methodological approaches

A quantitative approach has been employed for the data collection and a qualitative analysis undertaken with the data that has been collated and sorted into themes. The pop-up survey using the New Zealand census style of data collection appeared on the homepage that is accessed by *Te Aka* users for a six-month period in 2015. Information sought from the users include ethnicity, nationality, location, age range, education and occupation. Users responded using drop-down boxes. This will be discussed in more detail in Chapter Four: Methods.

Concluding Comments

Notably the targeted population for this research is only 'users' of *Te Aka Māori-English, English-Māori Dictionary* online. This means that some assumptions can be made regarding the findings of the research, the first being that this research rates 'users' who already have discovered *Te Aka,* and are in some way engaged with te reo Māori either as a learner of the language, a researcher, or a user of the language. Therefore, underpinning the findings is a 'bias' which will reflect usage, patterns and trends

amongst a cohort of 'users' already engaged in some way with te reo Māori and digital technology. This is discussed in more detail in Chapter Four: Methods.

Chapter Two: Background

Introduction

In the 1987 Māori Language Act, the Māori language became an official language in Aotearoa/New Zealand and the Māori Language Commission was established. This was a defining moment in the history and status of the Māori language. It gave recognition to the numerous revitalisation initiatives for the regeneration of the Māori language and inspired communities to maintain their zeal and determination to continue to build and develop new strategies.

Positive social impact of Māori language intitatives

There have been many language revitalisation initiatives in the last forty years, including Māori broadcasting and programming, Kaupapa Māori education, Māori medium education, Te Matatini Māori Performing Arts Festival, the traditional fine arts of *whakairo* (carving), *raranga* (weaving) and *tā moko* (tattoo), Māori sports including tennis, golf and *waka ama*, Māori musicians and composers/compositions in the Māori language and Treaty of Waitangi claims, bringing the Māori language into New Zealand homes and wider society. The revival of cultural pride (including cultural knowledge and the language) amongst many Māori and embraced by non-Māori, reflects the vitality of *te ao Māori* (the Māori world) and its relevance to contemporary society in Aotearoa/New Zealand (Ka'ai et al, 2004 p.187). Moreover, these initiatives and strategies have raised people's consciousness with the effect of transforming perceptions and attitudes of the Māori language in Aotearoa/New Zealand where people are beginning to embrace the Māori language and view it as being an integral part of our nation's identity. It is about 'normalising' the language across as many domains as possible within New Zealand society.

> *Ko te reo te mauri o te mana Māori*
> (Language is the life force of Māori prestige).
> If the language dies the culture will die and something quite unique will have been lost to
> the world.
> (Waitangi Tribunal, 1986, cited on p.1)

Of significance is that our first graduates from Kura Kaupapa Māori are raising their children in the Māori language and so the next generation of children are now being educated in immersion education contexts.

> *Ko tōku nui, tōku wehi, tōku whakatiketike, tōku reo*
> (My language is my greatness, my inspiration, that which I hold precious)
> (Waitangi Tribunal, 1986, cited on p.1)

New technologies and digital new media

New technologies and social media have had an effect on the language in the way that it is being perceived by both Māori and non-Māori within New Zealand society. New technologies, a hallmark of globalisation, are being exploited and developed to provide innovative ideas for language learning that confer a new vigour on a younger generation to re-appraise and learn its Indigenous language (Ka'ai, Moorfield & O'Laoire, 2013, p.115).

The presence of new technologies presents a progressive pathway for language revitalisation, with the archiving of language materials, in particular (minority languages) such as the Māori language, that could enable a new 'technologically enabled Māori language pedagogy' (Ka'ai et al., 2013, p.115). Holmes (2012) posits that digital technology is a potential asset to the language planning and acquisition of endangered languages. He believes that the linguistic goal for minority or endangered languages is to increase one's digital linguistic footprint on the web, that will not only be seen as a resource and teaching support but as a 'generator of cultural interest and indeed economic activity' (Holmes, 2012, p.59).

As discussed by Ka'ai et al., (2013) the internet has become a local community for minority languages, more commonly the use of new media as a platform to produce, promote, and encourage the use of endangered languages worldwide. Examples of the use of these new technologies include the *Te Whanake* series, which is a set of learning resources that aim to develop the acquisition of Māori language skills from beginner's level right through to the advanced level of speaking, the Te Ara Poutama Intranet, an online digital platform that helps to manage the 'growing use of technology in the teaching of Māori' (p.125), as well as Te Kāwai Kūmara, a pilot project introduced in 2009 as part of the postgraduate programme established under the Masters of Arts programme in Te Reo Māori at the Auckland University of Technology. The aim for this programme was to build Māori scholars and their research capabilities and capacities in teaching and learning through research in the Māori language that was supported by digital technologies.

The new forms of content on these online digital platforms, allows members of the minority and endangered languages to become 'producers rather than passive recipients of content' (Ka'ai et al, 2013, p.118), as well as creating new literacies that are a representation of the social and critical practices that help to empower learners as they engage in their identities. The presence of digital media in this sense, allows for language revitalisation efforts to influence language behaviour, in that it is used

to help promote and develop language by introducing new terminology whilst helping spread new technology worldwide (Ka'ai et al., 2013).

With respect to new technologies for endangered languages, the Māori language is similar to that of the Irish Gaelic language and the influence that technology has on the language (Holmes 2012). The geographical information systems or the linguistic digital map, created by Holmes (2012) alongside other academic and technology staff, is a real-time linguistic distribution of the language and behaviour patterns that combines databases and statistics to show the Gaeltacht communities "where they came from in relation to the historical linguistic trajectory and where they were going if certain linguistic criteria was met on one hand, or ignored on the other" (p.59). In the context of Irish Gaelic, if the roles were reversed and documents were given in Irish instead of English, it would mean minority languages would be given status, and the empowerment of the Irish speaker to become fluent and proactive in the use of the language will be encouraged. Furthermore, new media allows for online dictionaries and translators to help with language learning. These languages that are used in new media serve as a way of indicating that minority and endangered languages can be seen to be of relevance for young speakers, through the use of new media tools as well as the increase of the use of languages within social media.

Social media

The presence of social media allows for online community language groups to be created as a way of promoting language use. It is able to improve the health of the language, as it is a platform that connects indigenous people with others of the same language group, despite the geographical distance. Keegan, Mato and Ruru, (2015) express that one way of improving the health of te reo is to increase the number of domains where it is currently used, in a variety of environments. In particular, the use of social media has provided a platform for indigenous languages to communicate with others, specifically through the use of twitter (Alexa, 2014). Six indigenous languages that are widely used on twitter are the 'Basque, Haitian Creole, Welsh, Irish Gaelic, Frisian, and Kapampangan [languages]' (Keegan et al., 2015, p.64).

In the case of te reo Māori there was an increase in the number of Māori tweets between the years 2011 and 2013 (Mato & Keegan, 2013). This was primarily as a result of the events significant to the Māori culture, such as Te Matatini and Māori Language Week. The highest number of tweets came from the main city centres around Aotearoa New Zealand which are Auckland, Wellington, and Christchurch. In addition to this, were transient Twitter users in the less populated areas such as Palmerston North, due to the tertiary institution in that region, as well as Nelson, Picton and Tauranga,

as locations of ferry terminals and ports, and Northland, with all of the tourist attractions that it offers to travellers from abroad (Scannell, 2013). However, the article also draws upon the fact that even though there are tweets in te reo, the majority of tweets use the language minimally, and the highest number come from religious texts.

In a case study that was undertaken by a research summer studentship at AUT University, the findings revealed four key points as to why Māori users were tweeting. These were that users would only respond in Māori to tweets where topics were of interest, secondly, was the idea that te reo Twitter users were likely to initiate conversations in Māori if another user encouraged it, thirdly, was that some users would use English in their tweets, and lastly was that the time of the day was a contributing factor to the number of tweets that were going out daily. Keegan et al., (2015) identify that the use of bilingual tweets both in English and Māori showed users would shy away from interacting with the conversation as a result of their lack of fluency in the language, and the reason as to why those who followed did not directly participate in the Twitter conversations. This may be of particular interest for further research, in order to gain more active use in tweeting using the Māori language, or other minority languages in general, that will see social media as a way forward for language revitalisation.

Concluding Comments

Research into the use of new technologies and media for Māori and other minority languages has been discussed as a progressive pathway for minority languages as platforms that produce, promote and encourage the use of endangered languages. These initiatives may be the next step to revitalising the Māori language for generations that are still to come.

Chapter Three: *Te Aka Māori-English, English-Māori Dictionary*[1]

Introduction

After the second edition of the *Te Aka Māori-English, English-Māori Dictionary* was published in 2005, it was decided that it would benefit Māori language learners if the dictionary was also available free online. Some of these benefits are articulated later in this chapter. One of the most compelling arguments for producing online dictionaries is their accessibility. This will be highlighted when the high numbers of people accessing the online dictionary is discussed in Chapter Six.

This chapter backgrounds the dictionary, providing information about its aims, its features, the history of its development, the processes used to develop it, the advantages of the digital version, and a brief outline of the various digital forms of the dictionary.

Overview of *Te Aka*

Te Aka comprises selected modern and everyday language useful for those learning *te reo Māori*. *Te Aka* is broader than the traditional Māori dictionary, as *Te Aka* also includes:

- Encyclopaedic entries
- Explanation of key concepts central to Māori culture
- Explanations for grammatical items
- Idioms and colloquialisms
- Photographs
- Audio recordings for pronunciation and to help identify the sounds of fauna
- Example sentences in Māori from quality Māori language texts and sources for most entries, together with translations.

These example sentences have been included because they are important in communicating in a Māori context, and contribute to the understanding and speaking of the language. *Te Aka* builds on the dictionaries already available. Not only is *Te Aka* a collection of Māori words and their meanings; it also contains information useful for learners and speakers of the language to enable more effective communication in both oral and written forms of the language. *Te Aka* has been designed as a free resource that will help any learner become more fluent and literate in te reo Māori*.

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[1]   This chapter draws on earlier publications and papers by John C. Moorfield listed in the references.

Expanding the online dictionary has been undertaken intensively by Professor John Moorfield over more than twelve years and he continues to develop the dictionary. Professor Tania Ka'ai and staff from Te Ipukarea have made valuable contributions to the dictionary, including the loading of bird and animal sounds. The loanwords included in the dictionary draw from the He Kupu Arotau Loanwords Dictionary project, to which Dr Dean Mahuta and a former student Sarah Naylor made valuable contributions.

The history and genesis of the dictionary

The conception of the online *Te Aka Māori-English, English-Māori Dictionary* began in 2005 with a discussion between Professor John Moorfield and VO2 Web Design. In December 2006, the fruits of that discussion were realised with *Te Aka* online dictionary going live. Table 1 below outlines the chronology of *Te Aka* online*.

Table T1: Chronology of *Te Aka*

Year	Activity
2005	Initial discussions with VO2 Web Design to build the online version *Te Aka Māori-English, English-Māori Dictionary.*
2006	Content of the hard copy second edition of the dictionary *Te Aka Māori-English, English-Māori Dictionary*, published in 2005, loaded onto the administration site. The online public dictionary went live in December of that year.
2007-2011	Continued addition of new entries to the online website. Began adding photographs for species of flora and fauna and some important Māori personalities.
2009	Sounds of native fauna added.
2010	Special interfaces for iPhones, iPod Touches, & Android phones introduced. *Te Reo Māori* app launched.
2011	Inclusion of loanwords from *He Kupu Arotau: Loanwords in Māori* with example sentences and translations.
2011-2015	Added example sentences, with translations, for most sub-entries for each headword already in the dictionary. Completed adding new entries, with example sentences and translations, especially from other specialist dictionaries, including *Te Reo Pūtaiao, Te Reo o Ngā Toi Ataata, He Papakupu Reo Ture: A Dictionary of Māori Legal Terms.*
2015-2016	Added the audio for each headword in the online dictionary using the voices of Professor Wharehuia Milroy and Te Haumihiata Mason. 18,000 headwords recorded and loaded onto the website. Checking through *A Dictionary of the Māori Language* for new entries and adding these with all relevant details, including example sentences with translations. Adding vocabulary for mathematics.

During the time that the dictionary has been live, from December 2006, a large amount of material has been added. As well as many new headwords, many new sub-entries, example sentences with translations, photographs and audio recordings have been added. Currently there are more than 23,000

Māori headwords, each having between 1 and 16 sub-entries. This work continues and the number of headwords and subentries is increasing each day.

In addition the website has had new features added and three 'face-lifts'. The interface has been adapted for smaller devices, such as iPhones, iPads, iPods Touches, Android smart phones, and tablets. The launching of the *Te Reo Māori* app for smart phones and tablets (Apple and Android) in 2010, added even more mobility and accessibility for the dictionary. The app has two main advantages:

1. When wifi or 3G/4G are available the app automatically accesses the online dictionary, but if these are not accessible the app has a recent version of the dictionary stored on the device. Thus it can be used anywhere in the world.

2. The app has a feature, called Favourites, which enables the user to store any words searched for. This helps the learner to revise new words.

The process of creating the *Te Aka* online dictionary

John Moorfield and the staff of Te Ipukarea have developed the content of the website, with VO2 Web Design constructing and maintaining the website. This has proved a very successful collaboration. Figure T1 outlines the process involved in creating the online *Te Aka Māori-English, English-Māori Dictionary,* showing the roles of the three main groups in the successful establishment of a reliable and useful online dictionary – the web designer, the language experts and the users.

Figure T1: Process to create the online *Te Aka Māori-English, English-Māori Dictionary*
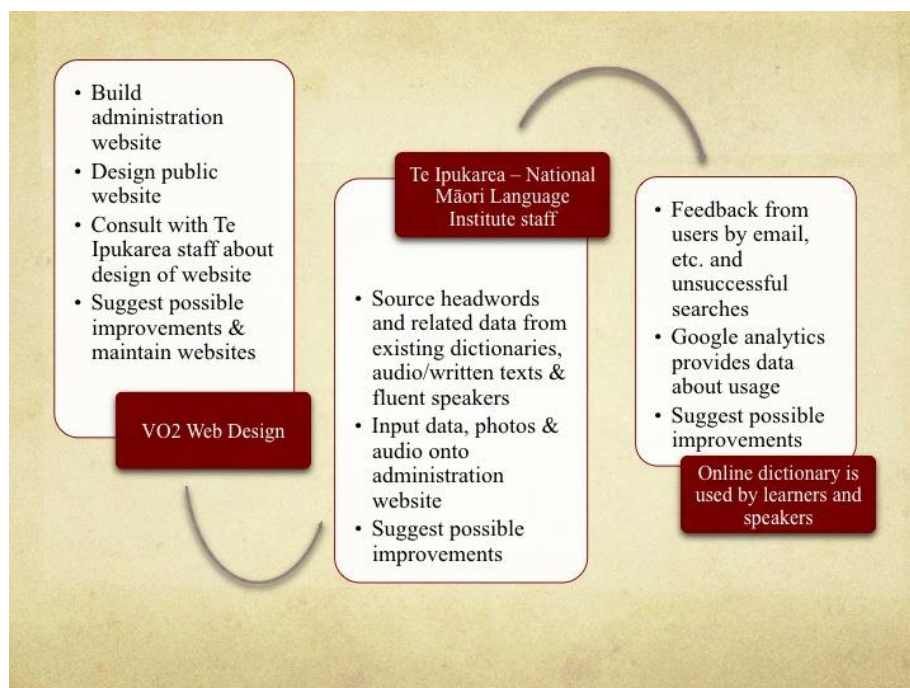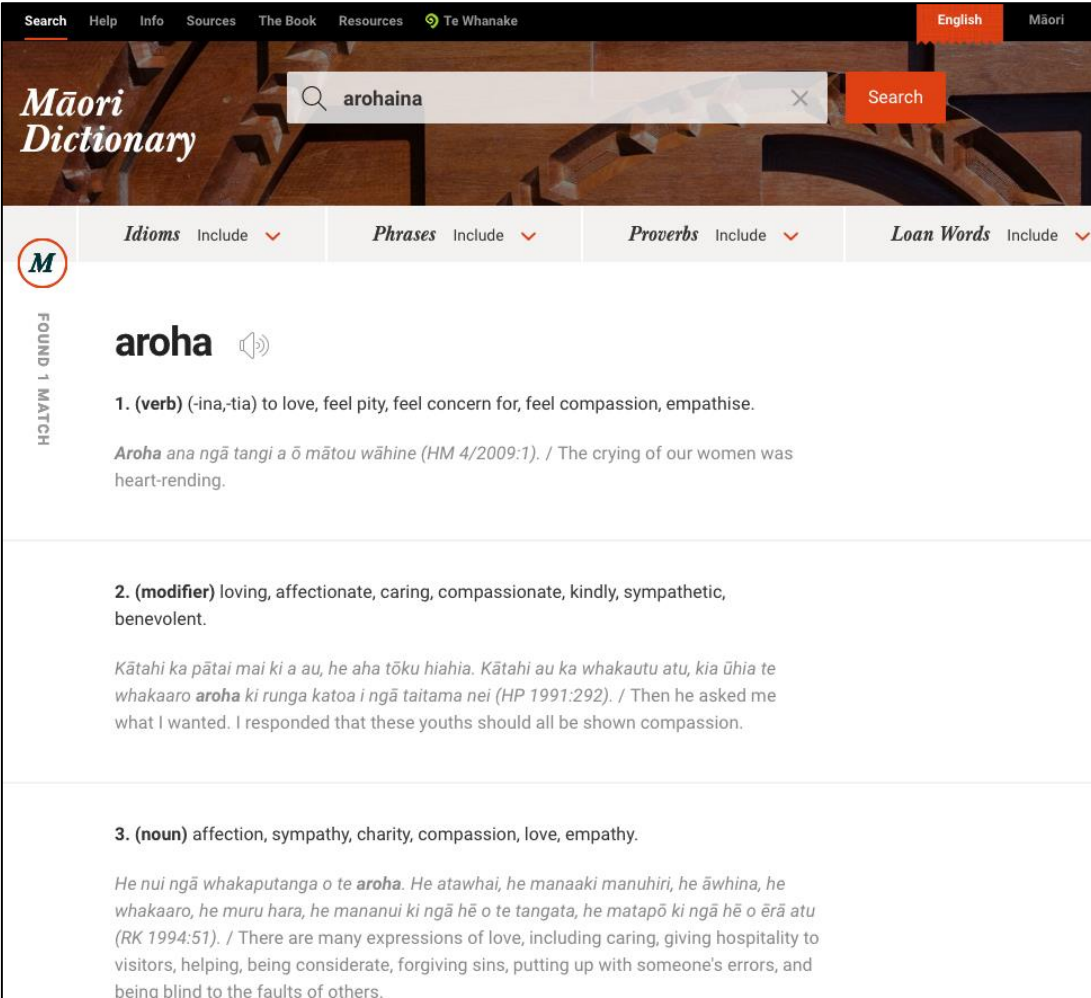
(Source: Moorfield, 2012b)

Using *Te Aka*

Te Aka has been indexed to the *Te Whanake* series of narrative texts and resources, providing quick access to topics, grammatical and usage explanations, idioms and colloquialisms, maps and illustrations. Users are able to locate information quickly, which speeds up their learning of te reo Māori.

Unlike traditional dictionaries, *Te Aka* has encyclopaedic entries, including the names of plants and animals (especially native and endemic species), stars, planets and heavenly bodies, important Māori people, key ancestors of traditonal narratives, tribal groups and ancestral canoes. Māori names for institutions, country names, place names and other proper names have also been provided. The entries have been designed to provide not just the translations, but also important information about, for example, a person's life and why s/he are important. Detailed explanations of key concepts that are central to Māori culture have also been included.

Image T1: Search Function Capability

(Source: http://maoridictionary.co.nz)

Also incorporated into *Te Aka* are comprehensive explanations for grammatical items with examples of usage, idioms and colloquialisms with their meanings and how to use them. These are important in communicating in Māori contexts and contributes to understanding and speaking the language in a natural way. *Whakataukī, whakatauākī* and *pepeha*, with explanations, have also been included in the dictionary as example sentences.

Using a fast search engine, *Te Aka* can be searched using both Māori and English words, which produces results almost instantly. In searching for Māori words, it is not necessary for the user to know the correct vowel lengths, so the dictionary provides a quick way to check where the macrons should be. A further example of the search function capability is where a user has added a passive ending, e.g. if the word *arohaina* is entered, as in Image T1 above, the dictionary will produce the entry for *aroha*.

As mentioned above, the Māori names of species of plants and animals have been added and are identified by their common New Zealand English equivalent and the Latin binomial. Each species or animal has been described with some key features and, where possible, photographs have been included (Image T2) and the calls of most of the native birds can be heard by selecting the appropriate icons.

Image T2: Kōkako

(Source: http://maoridictionary.co.nz)
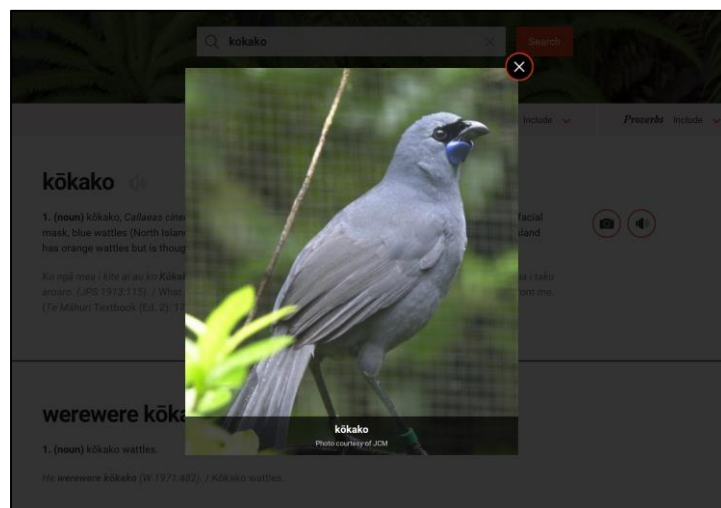
While there are some plants and animals that have a number of Māori names, with cross-referencing the user is taken to what is regarded as the most common name.

The headword entry also lists each different meaning and part of speech separately as sub-entries. Studying the sample sentences helps users use the word correctly so that the dictionary functions

almost like a textbook. These example sentences have been selected carefully from quality Māori language texts or other sources. Example sentences have been included for most separate meanings and parts of speech so that the word can be seen in context. The translations are to help with understanding the language. Unless referenced otherwise, these translations are by the author, except in the case of example sentences taken from the Māori Bible, where all the translations are from the King James Version. Learners are able to improve their understanding and fluency by studying these example sentences carefully.

In selecting an example sentence the following criteria have been considered, in approximate order of importance:

- The sentence selected reflects good quality language with correct usage.
- As much as possible the sentence provides clarity in the meaning of the word(s) in question.
- The sentence adds further information about the meaning of the word that may not be contained in the English gloss. For cultural concepts, the sentence may include further information about that concept or cultural practice.
- The sentence relates to an important event in history.
- Someone known for his or her knowledge of Māori culture, language and/or history may have produced the sentence.
- The sentence is from a publication well regarded for the quality of the language used, e.g. the five volumes of *Ngā Tāngata Taumata Rau*, or the four volumes of *Ngā Mōteatea* by Ngāta & Jones.

Advantages of a digital dictionary

Print and online dictionaries are important tools for both second language learners and fluent speakers of a language. Dictionaries clarify meanings, parts of speech, usage, spelling, macrons, diacritics, etc. For learners, dictionaries help them learn new words, enabling them to express themselves more clearly and improve their comprehension of the language.

Dictionaries are also important tools when learners do not have ready access to fluent speakers to clarify meanings and other information, a situation which is common for learners of endangered languages.

Some advantages of online dictionaries include:

- A printed dictionary is restricted in size and entries are often small and dense on the page. There is less restriction on size for online dictionaries and therefore they can be presented in a more readable and attractive format using colour and space. Online dictionaries have the potential to contain all information a user may need such as usage notes, example sentences, illustrations, audio and video clips. This facility is especially useful in helping identify plant and animal species or entries where a description is inadequate.

- The mobility and convenience of an online dictionary is one of its major advantages.

- An online dictionary can be continuously and easily updated and is not delayed by publication dates.

- An online dictionary can be an aid to pronunciation with the inclusion of audio files.

- With a bilingual interface, it is much quicker to find a meaning for a word or the equivalent in the other language. Search engines are usually much faster than manually searching a hard copy print dictionary. They can even accommodate misspellings and diacritics such as macrons.

- Photographs of important people help with identification. Even recordings of people renowned for their oratory, or the sounds of traditional musical instruments can be included.

- Production costs are less and distribution is much easier, inexpensive and faster.

- No disc space is required to store the online dictionary on your computer.

- Producers of an online dictionary can have multiple authors working on the administration site.

- Users can determine the kind of data and indicate what is missing from the online dictionary, e.g. the *Te Aka* administration website has a feature that lists data about recent unsuccessful searches.

- With online dictionaries cross-referencing is done easily and links to other entries can be made very quickly.

- Google analytics provides valuable information about usage.

- Online surveys for research can be conducted quite easily on the website.

- Being free, the online dictionary has a major advantage for users over the cost of a hard copy dictionary.

Forms of the *Te Aka* dictionary

The online *Te Aka* dictionary has separate screen interfaces for computers, tablets, iPads, iPhones and smart phones, designed especially for the various sized screens. As well as the print dictionary and the online dictionary, *Te Aka* is also available as an app. for iPhones, iPads, iPod Touches and Android phones, tablets and devices (Image T3). Called *Te Reo Māori*, this app. enables the user to search the dictionary on their device without the need for an Internet connection.

Image T3: *Te Reo Māori* app for Android
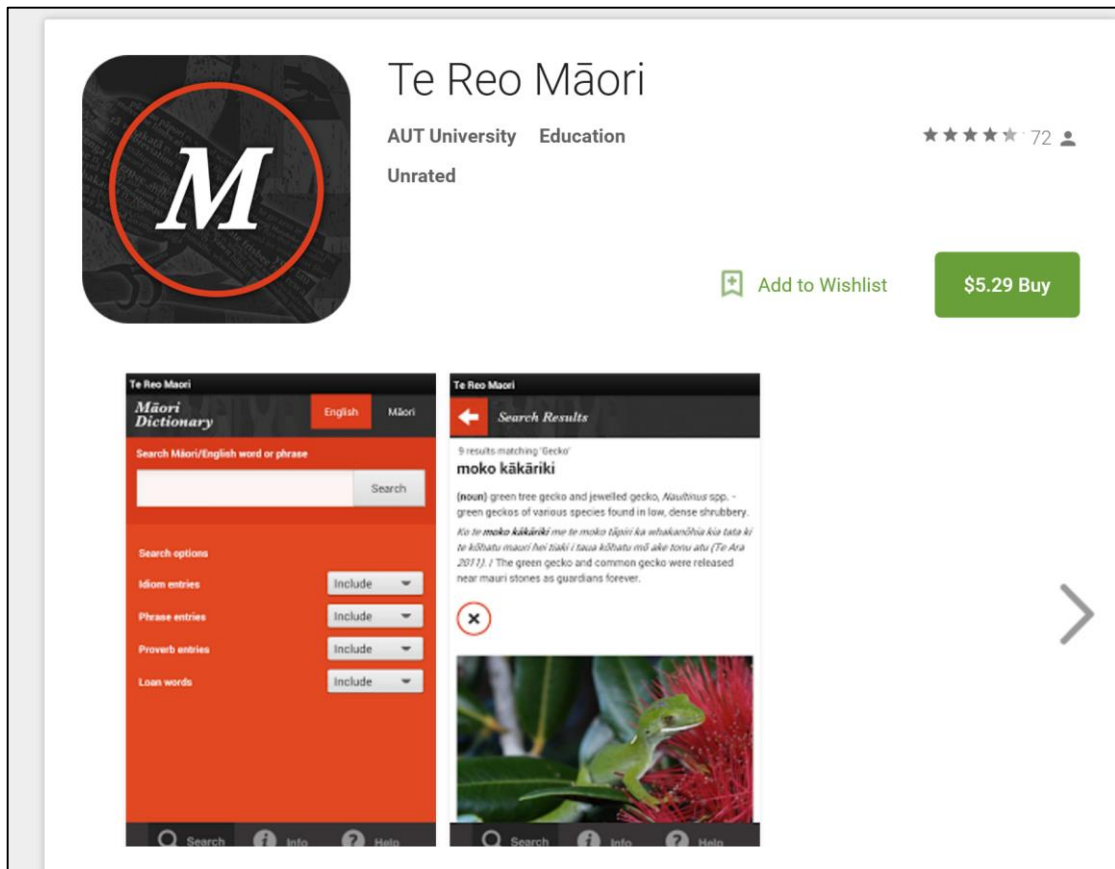
(Source: Moorfield, n.d.)

Concluding Comments

As well as an outline of the development and the features of the *Te Aka* online dictionary, the advantages of having a dictionary online, and as an app, have been discussed in this chapter to provide the reader with an understanding of the *Te Aka* online dictionary before delving into the research about how the dictionary is being used and by whom. The rapidly increasing number of users accessing these various digital versions reflects their value in terms of the accessibility, mobility, convenience and in-expense of these resources for Māori language speakers and learners. This increase in numbers of users will be discussed in Chapter Six.

Chapter Four: Method

Introduction

This chapter outlines the research method employed in this study. It includes sections on the rationale of the chosen method, the instrument used, participant information, sampling method, survey response details and concludes with a description of the analysis procedure employed.

Aim of the Study

The study aims to measure how the Māori language is valued and by whom, and reasons for accessing the resource by tracking the demographics of users of the *Te Aka* online Māori dictionary and *Te Reo Māori* app. The pop-up survey on the *Te Aka* online Māori dictionary and *Te Reo Māori* app. collected rich information about the users, including for what purpose and feedback on the use of digital technology in the preservation of the Māori language.

Rationale for chosen method

A mainly quantitative approach was employed for the collection and analysis of this study. The *Te Aka* online dictionary and the *Te Reo Māori* app are the platforms used to collect the survey data. See Chapter Three for more information about the platform. Qualaroo https://qualaroo.com/, a company specialising in targeted website surveys was hired to develop and provide a customised survey instrument for the research team.

A pilot study was set up for 24 hours starting 9.00am Thursday 21 August 2014 and ending at 9.00am Friday 22 August 2014 which attracted 5416 views and 449 responses. Results from the pilot study provided critical information for the study to be conducted in 2015. The priority for the pilot study was to test the survey instrument and the technology used. The online survey was completely anonymous and self-selecting. Personal details such as names and addresses were not asked for in the survey. Visitors to the *Te Aka* online dictionary were prompted about the survey, with a brief explanation about who we are and why we were conducting the survey. Participation in the survey was voluntary and optional and participants could opt out of the survey at any time. By completing the survey, the respondents consented to their participation.

Data collection and instrument

Survey data was gathered from a web-based intercept (pop-up) survey using Qualaroo technology. The advantages of intercept survey over traditional surveys is cost, that is, no print and postage and no

contact or follow up costs are incurred. A disadvantage would be personnel costs, that is, programming expertise and software costs. When considering only postage and printing costs, e-mail and web surveys appear to be cheaper than postal mail. In actuality, it appears that web surveys become more economical than postal mail surveys only when the number of responses reaches a certain threshold which is somewhere between a few hundred and a thousand.

Survey content

The pop-up survey consisted of 19 items. This was the recommended limit by Qualaroo experts. The first item asked users if they wanted to participate in the survey. The survey also contained general questions about *Te Aka*, demographic/socio-economic, socio-linguistic and language proficiency questions. Where possible, questions asked were identical to those used by Statistics New Zealand surveys. See Appendix 1 for the full list of questions and multi-choice responses.

Timeline

The survey went live 9am 1 July 2015 (NZT) and closed 12pm 11 November 2016 (NZT). The survey period included some time either side of Te Wiki o Te Reo Māori (Māori Language Week) 2015 (27 July-2 August).

Ethics

An Ethics application was submitted and approved by the Auckland University of Technology Ethics Committee (AUTEC) on the 16 December 2015 (13/349 - Measuring the value of digital resources for learning te reo Māori: A case study of the *Te Aka* Māori Language Dictionary Online and the *Te Reo Māori* dictionary app.)

Research Participants

The participants for this study were users of the *Te Aka* online Māori dictionary and *Te Reo Māori* app. *Te Aka* is used by people of all ages in a variety of contexts including the home, prison, education, early childhood centres, Kōhanga Reo, Kura Kaupapa Māori, primary and secondary schools, wānanga and tertiary providers and in other workplaces such as the public and private sectors. All participants have the choice to remain anonymous and importantly, as participation is completely voluntary, they can choose not to participate.

It is acknowledged that gaining consent from participants under the age of 16 is a difficult task. However, due to the nature of the collection method there is no risk of identification or harm to participants under the age of 16 by being part of this survey.

Sampling method employed

This study uses a non-probability convenience sample. Fricker (2008) describes convenience samples when either the probability that every unit or respondent included in the sample cannot be determined, or it is left up to each individual to choose to participate in the survey. For example, our study simply posted the pop-up survey on the website and left it up to those browsing through the site to decide to participate in the survey ('opt in') or not. As the name implies, such non-probability samples are often used because it is somehow convenient to do so.

Using convenience sampling, statistical inference is problematic because respondents who have an active interest may be more than likely to self-select ('opt-in') into the survey than others so the survey would likely over-estimate the degree of concern within the population. Although the study uses convenience sampling it was good to use formal statistical tests to make sure the analysis was statistically rigorous even though the data is not properly random probability.

Survey Data Analysis

Statistical Package for the Social Sciences (SPSS) was used to extract and analyse the data. Bi-variate and multi-variate descriptive frequency and cross tabulations and means analysis with accompanying p-value (statistical significance) and ETA (Effect size) statistical tests, were generated from this tool to examine the data.

Over a dozen means tables and almost two hundred bi-variate and multi-variate cross tabulation tables were generated for further exploration. Of the means tables and multi-variate cross-tabulation tables, a selection was analysed and interpreted in this report. The selected tables are presented (in the form of charts and standard tables) in the findings chapter of this report. The discussion chapter gives interpretations and draws conclusions from this selection of data.

Responses

Qualaroo results showed 802,477 views of the survey over the period with 18,841 responses. Responses included partially and fully completed survey responses. Partially completed surveys include

respondents that said 'No' to the initial pop-up prompt – 'Help us make your Te Aka and/or the Te Reo Māori experience better. John C Moorfield'.

5,391 surveys were used for further analysis. Of the 18,841 responses, all responses that answered 'No' to the initial pop-up prompt (see above) and all surveys that did not provide an answer to question 1- For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app? - were excluded. This gives a response rate of 28.6%.

Methods of analysis

Variables

There is a set of independent variables that include the age of the respondent, country of birth of the respondent, ethnic group of the respondent, educational qualification of the respondent and occupation of the respondent. Dependent variables are grouped in three sets:

Responded Māori language ability	the respondent's self-assessment of his/her ability in the Māori language and how well the respondent is able to speak Māori in everyday conversation.
Attitudes questions	how the respondent feels about the Māori language being compulsory in New Zealand primary schools and how the respondent thinks about the Māori language being an important part of the New Zealand national identity.
Various dictionary use/why chosen	for what purpose are respondents using the dictionary and how is the dictionary helping the respondent to learn the Māori language.

Statistical weights

A simple weighting exercise was carried out using the age of respondents and the age demographic from the 2013 New Zealand Population and Dwellings Census. After further analysis, it was deemed appropriate by the research team, not to use weights as the data was not significantly different, and the age variable for some respondents were incomplete.

Types of analysis

Four types of analyses were conducted to investigate the questions Te Taura Whiri i te Reo Māori was interested in. They are:

1.   For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app? (Please select all that apply)

2.   Which ethnic group do you belong to? (Please select all that apply)

4.   What year were you born?

7.   In which language[s] could you hold a conversation about a lot of everyday things? (Please select all that apply)

8.   Rate your ability in the Māori language.

9.   How is *Te Aka* and/or the *Te Reo Māori* app helping you to learn the Māori language? (Please select all that apply)

13.   How do you feel about the Māori language being compulsory in New Zealand primary schools?

14.   Do you think the Māori language is an important part of New Zealand's national identity?

The first analysis tool is the use of Frequency Tables. These were used primarily to give initial percentages and counts for each of the questions. See Appendix 2 for a list of tables and charts. Secondly, a series of multivariate cross tabulations with accompanying ANOVA and Measures of Association tables were used. Many of these tables were not used in this report because they did not include variables of interest registered by Te Taura Whiri i te Reo Māori. Thirdly, a series of Means Tables with accompanying ANOVA and Measures of Association tables were used. This type of analysis is sometimes described as causal multivariate. The variables were a mix of independent and dependent variables as described above. These are represented in the four way tables in the Findings chapter (2 x independent variable by 2 x dependent variable). An advantage of Means Testing is that it can infer causality, that is, the dependent variables hypothesised to be the caused variables and independent variables hypothesised to be the causative variables. Finally, a series of bi-variate and multivariate cross tabulations with accompanying Chi-Square Tests and ETA value were used. These 2-way and 3-way tables are presented as charts in the Findings chapter. The three-way cross-tabulation method is used to see if what appears on the surface of the two-way cross-tabulations are better explained by some other factor such as age, ability in the Māori language and ethnicity.

The Chi-square statistic is the primary statistic used for computing the statistical significance of the cross-tabulation table. The chi-square statistic is used as the means of testing, or determining if the relationship is "statistically significant". The chi-square statistic, along with the associated probability of chance observation, may be computed for any table. If the variables are related (i.e., the observed table relationships would occur with very high probability, say as is common in social research only 95%) then we say that the results are "statistically significant" at the "0.05 or 5% level". This means that the variables have a high chance of being independent. Depending on the cost of making mistakes, the researcher may apply more stringent criteria for declaring "significance" such as 0.01 or 0.005. The

probability values (0.05 or 0.01) reflect the researchers' willingness to accept a type I error, or the probability of rejecting a true null hypothesis (meaning that we thought there was a relationship between the variables when there really was not). Furthermore, these probabilities may be cumulative, meaning that if 20 tables are tested, the researcher can be almost assured that one of the tables is incorrectly found to have a relationship (20 x .05 = 100% chance). The significance level or p-value chosen for this study is p= 0.05 or (5%).

The effect size is measured by the ETA value where the dependent variable (DV) is equal to responded Māori language ability, attitudes questions and various dictionary use/why chosen. Cohen (1992) describes effect size as an estimate of magnitude or strength of the relationship between two or more variables. Cohen further defines effect size and gives values for various tests. A test for Chi-square goodness to fit and contingency, small (0.10), medium (0.30) and large (0.50). a test for One-way analysis of variance, small (0.10), medium (0.25) and large (0.40).

Concluding comments

The pop-up survey combined with statistical analysis is a useful method to gain information and insight from users of the *Te Aka Māori-English, English-Māori Dictionary* online about their use of the online dictionary, the features they particularly like, what is missing, if the tool is supporting the revitalisation of the language and their views on socio-political issues about the Māori language. The quantitative approach used in this study is critical as it provides statistical data and evidence from a large number of respondents which clearly is an advantage to determine if online dictionaries are useful tools in language revitalisation.

Chapter Five: Findings

Introduction

This chapter provides a critical commentary on the results obtained from the *Te Aka* pop-up survey conducted during July through to November 2015. Table F1, Figure F1 and Figure F2 provide selected demographic information from the survey to give an overall picture of the results.

Table F1: Counts and case proportions for selected demographic variables.

		Count	N=%
Source (n=5,391)	Te Reo Māori app survey	3,367	62.5%
	Te Aka survey	2,024	37.5%
Which ethnic group do you belong to? (n=5,009)	Māori	2,871	57.7%
	New Zealand European/Pākehā	1,746	35.1%
	Other	392	7.2%
Which country were you born in? (n=4,911)	Other	554	11.3%
	Australia	236	4.8%
	New Zealand	4,121	83.9%
Age group (n=4,054)	7-19	636	15.7%
	20-29	692	17.1%
	30-39	838	20.7%
	40-49	855	21.1%
	50-59	684	16.9%
	60-69	273	6.7%
	70-79	69	1.7%
	80+	7	0.2%

Figure F1: Survey Ethnic Groups proportions

Figure F1: Survey Ethnic Groups proportions

Figure F2: Survey Age Groups
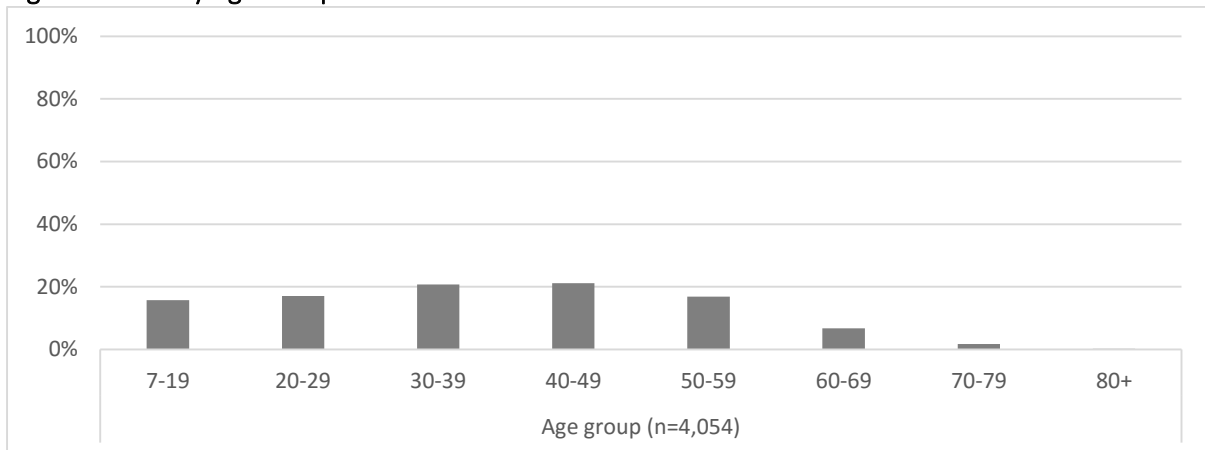
Layout of the findings

The layout of the findings is organised in a specific way. The first section relates to the purpose and usage of *Te Aka* and/or the *Te Reo Māori* app. This section is further organised by the presentation of 2-way multiple response charts by ethnic groups, age groups, ability and status of the Māori language. Two additional 3-way charts are included that provide mean scores for ability in the Māori language and respondents able to hold an everyday conversation in the Māori language both by age and by ethnic group. To conclude the section, a series of selected 4-way means score tables are included that specifically look at the two key questions about the purpose and the use of the online Māori dictionary and specifically, questions 1 and 9.

The second section in this chapter investigates the attitudes towards te reo Māori, and specifically questions 13 and 14. The section begins with charts and tables that investigate the two attitude questions by ethnic group and age. The section concludes with a series of selected 4-way means score tables to further explain the phenomenon.

The general format within these sections begins with a figure, followed by a descriptive analysis of the data. Some discussion is given to provide further explanation of the findings.

Section 1: The purpose and usage of *Te Aka* and the *Te Reo Māori* app

Second language acquisition and proficiency

Despite the role of te reo in education, it is clear that the endangerment of the language is due to the proficiency of language (Albury, 2015). It is argued by Ratima and May (2011) that the initiatives for the revitalisation of the language are not a clear reflection of any increase in status, as the number of proficient speakers is too small to justify an overall health of the language. In terms of te reo Māori, Te Huia (2015) regards it as having close ties to the Māori cultural in-group membership that is formed together by a small number of Māori heritage language speakers with the hope of maintaining the language as their responsibility to the community, specifically to language learners who are beginners in the language through to the more advanced and proficient of speakers.

In the case of adult te reo learners, they face challenges to learning the language. Often, they are perceived as learners who are inferior, which has led many to opt to wait until they have returned 'home' (to their tribal districts) to learn the language. Ratima and May (2011) discuss three factors that may assist in improving the proficiency in language learning. These are: individual, social, and wider societal factors. In terms of the wider societal factors that could improve the proficiency of second language learners, demography and locations where a high number of adult te reo speakers live in close proximity to each other can be considered. This will allow the status of the language to become stronger, which can lead to proficiency being achieved within the employment sector, helping to increase the social status as well as being a marker for identity.

Figure F3: For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app? By selected Ethnic groups

For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app*?* By selected Ethnic groups
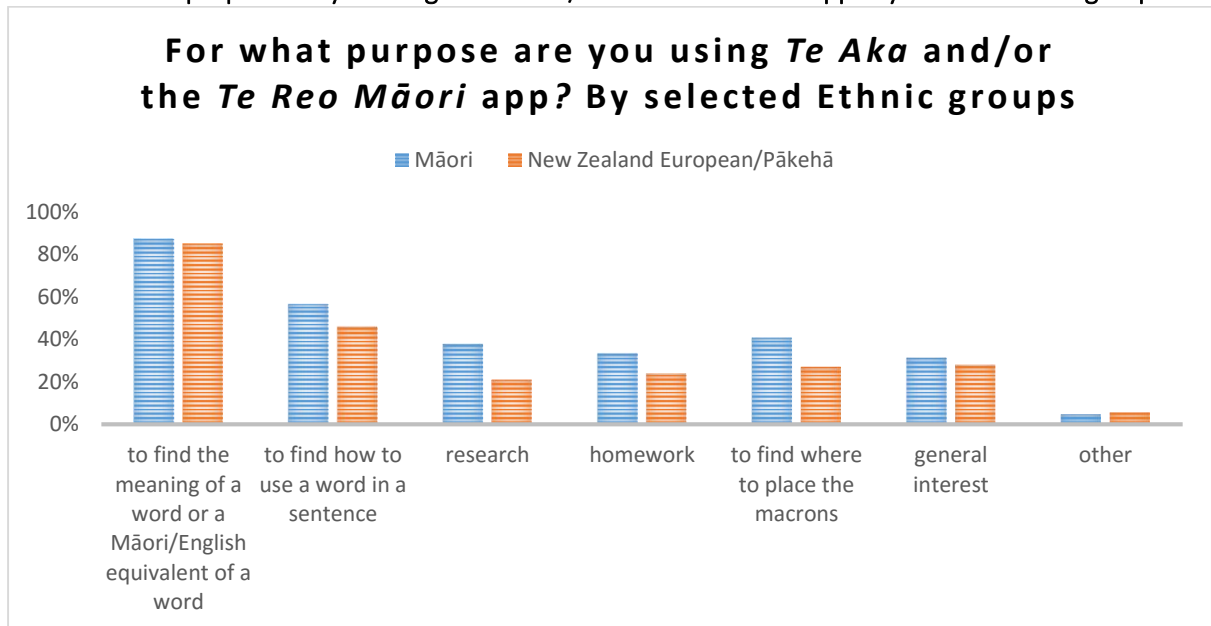
- The order is slightly different again when responses are analysed further by ethnic group.

- Māori - 1st '**to find the meaning of a word** or a Māori/English equivalent', followed by 2nd 'to find **how to use a word in a sentence'**, 3rd '**to find where to place a macron'**, 4th '**research'**, 5th '**homework'**, 6th '**general interest'** and 7th '**other'**.

- Pākehā - 1st '**to find the meaning of a word** or a Māori/English equivalent', followed by 2nd 'to find **how to use a word in a sentence'**, 3rd '**general interest'**, 4th '**to find where to place a macron'**, 5th '**homework'**, 6th '**research'** and 7th '**other'**.

Figure F4: How is *Te Aka* and/or the *Te Reo Māori* app helping you to learn the Māori language? By selected Ethnic groups

How is *Te Aka and/or the Te Reo Māori* app helping you to learn the Māori language? By selected Ethnic groups

■ Māori ■ New Zealand European/Pākehā
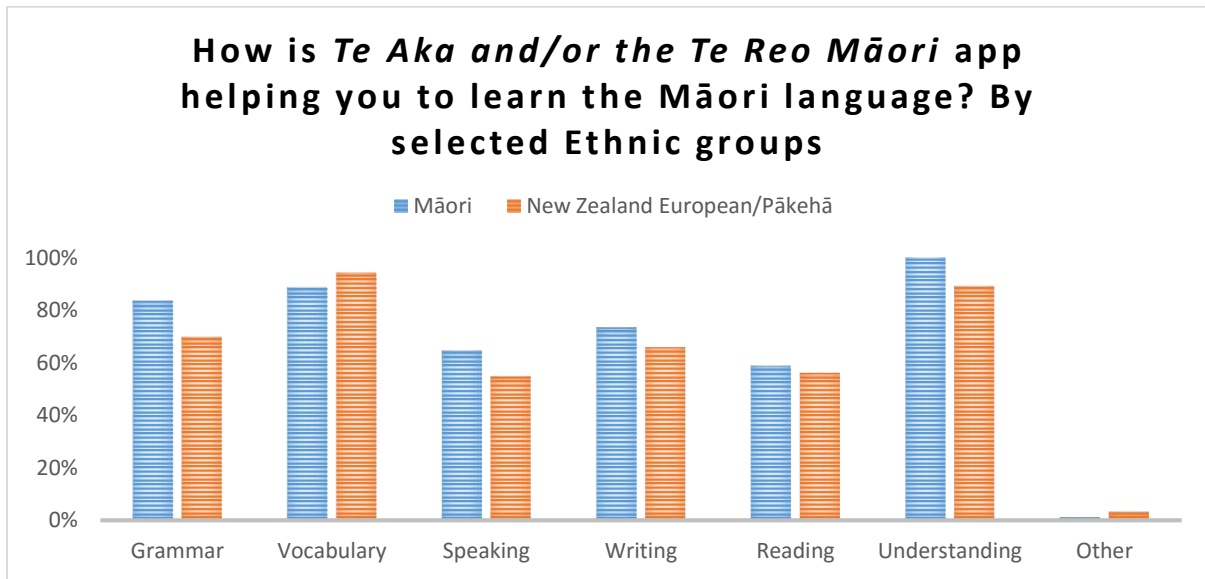
- Māori - 1st 'understanding', 2nd 'vocabulary', 3rd 'grammar', 4th 'writing', 5th 'speaking', 6th 'reading' and 7th 'other'.

- Pākehā - 1st 'vocabulary', 2nd 'understanding', 3rd 'grammar', 4th 'writing', 5th 'reading' 6th 'speaking' and 7th 'other'.

- Pākehā also have a higher proportion than Māori for 'vocabluary' 94.3% and 88.6% respectively. All other categories Māori have higher proportions than Pākehā.

Figure F5: Rate your ability in the Māori language? By selected Ethnic groups

Rate your ability in the *Māori language?* By selected Ethnic groups

■ Māori   ■ New Zealand European/Pākehā
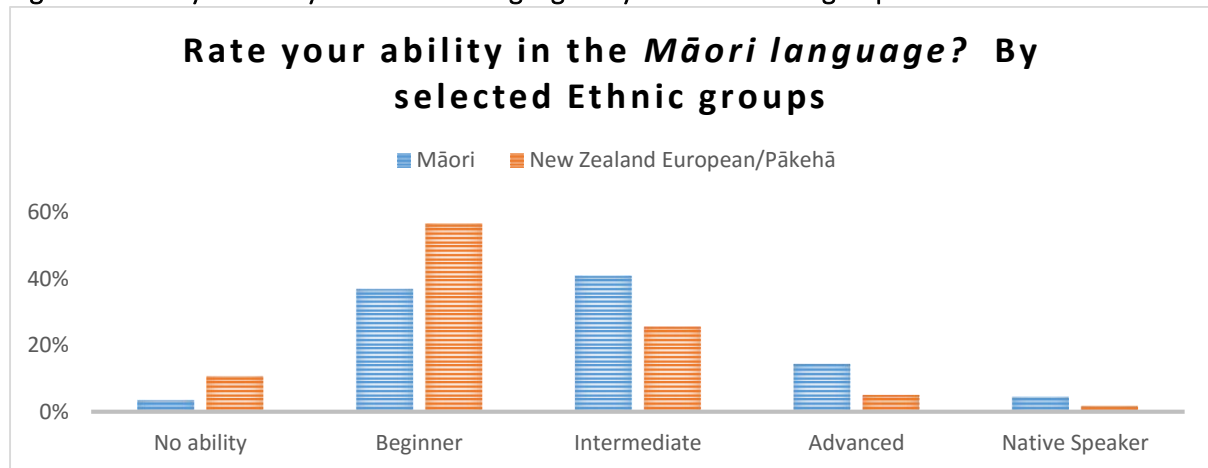
- Māori have higher proportions than Pākehā for Intermidiate 40.8%, Advanced 14.4% and Native Speakers 4.5% in ability in the Māori language.
- Pākehā have higher proportions than Māori in lower abilities, Beginner 56.7% and No ability 10.7%.

Age groups

Figure F6: For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app? By Age groups

For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app? By Age groups

- to find the meaning of a word or a Māori/English equivalent of a word
- to find how to use a word in a sentence
- research
- homework
- to find where to place the macrons
- general interest
- other
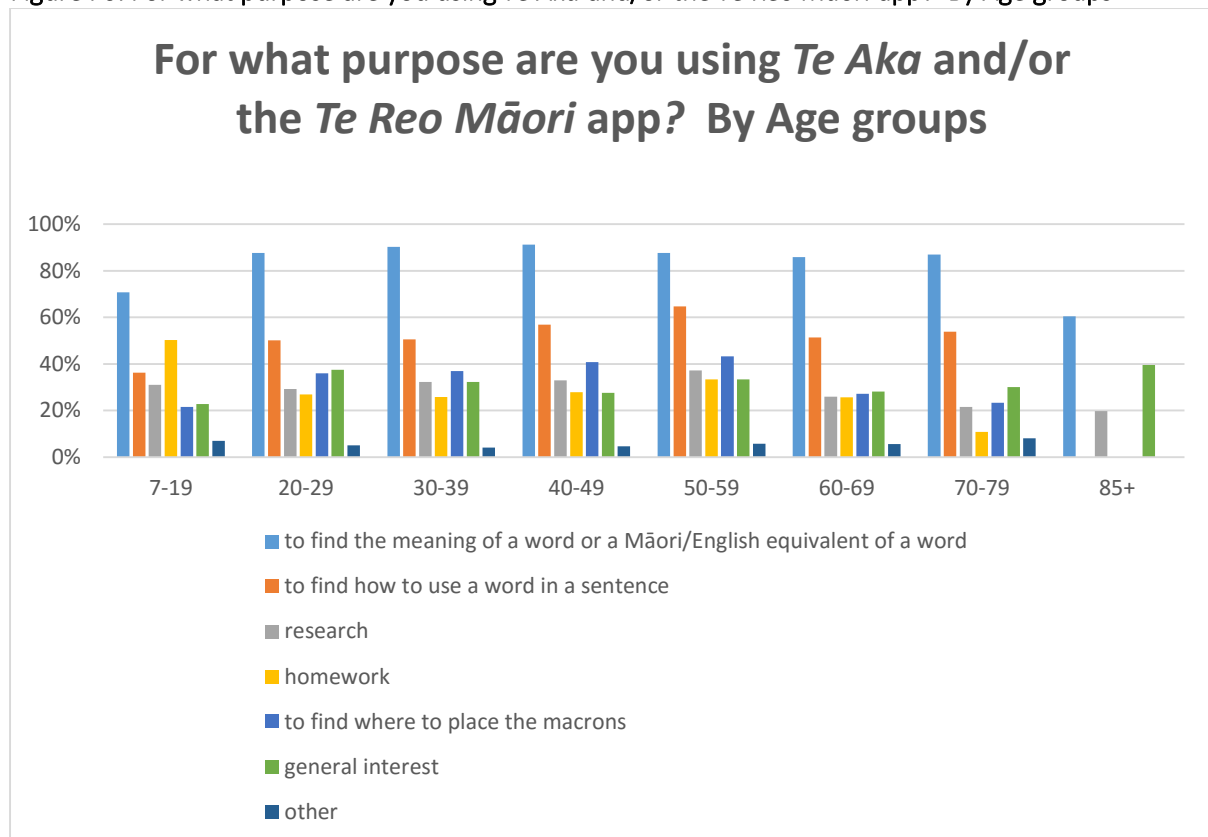
- 85+ age group- pirmarily use 'to find the meaning of a word or a Māori/English equivalent' 60.4%, 'general interest' 39.6% and 'research' 19.8%.

- 50-59 age group- highest proportion of users for 'to find how to use a word in a sentence' 64.7%.

- 40-49 and 50-59 age groups highest proportion of users for 'to find where to place a macron' 40.8% and 43.3% respectively.

- 20-29 age group highest proportion of users for 'general interest' 37.5%.

Figure F7: How is *Te Aka* and/or the *Te Reo Māori* app helping you to learn the Māori language? By Age groups
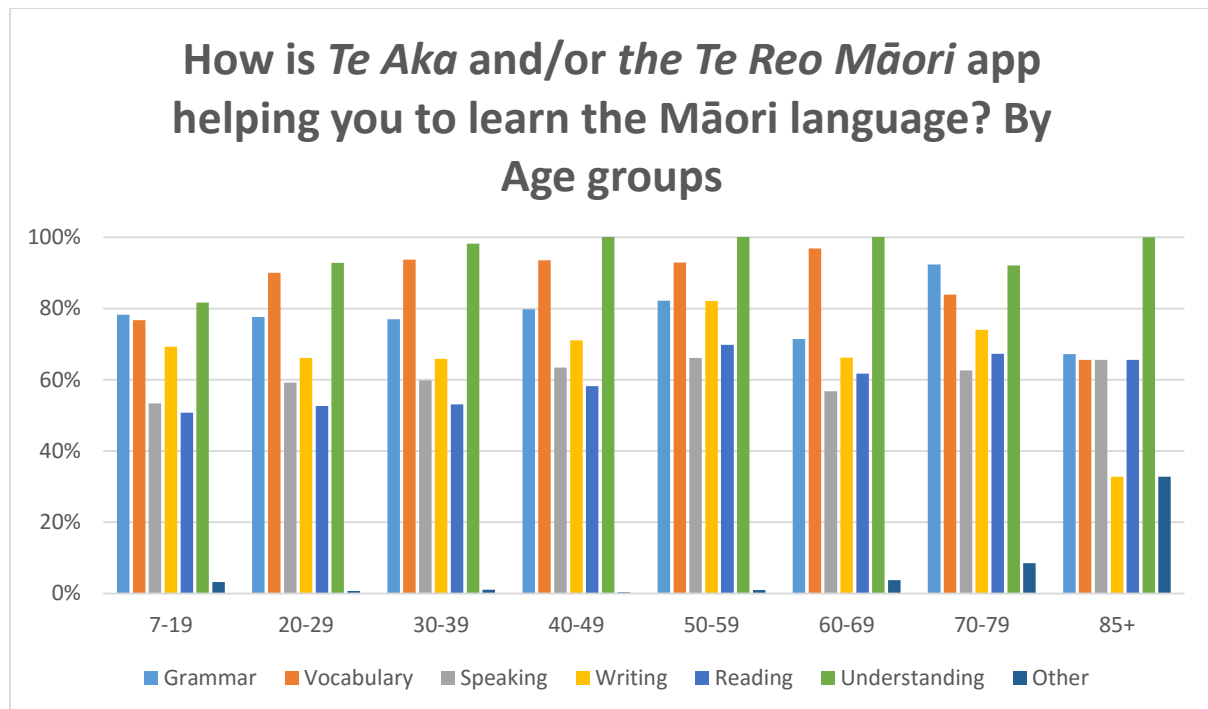
- 85+ age group all use it for 'understanding'.

- 70-79 age group primarlily used for 'grammar' and then 'understanding' 92.4% and 92.1% respectively.

- Ages 20-69 after 'understanding', 'vocabulary' is the next most commonly used for learning.

Ability in the Māori language

Figure F8: For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app? By ability in the Māori language
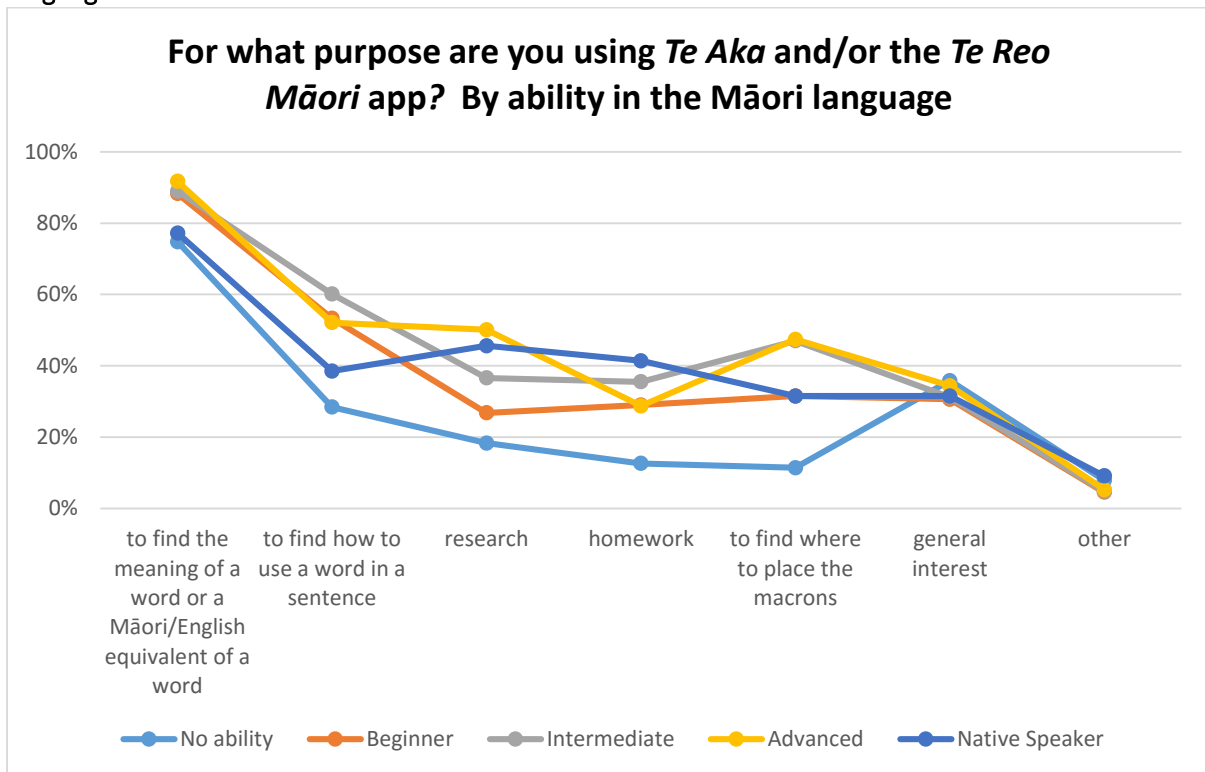
The line graph shows that *Te Aka* is primarily used to find a meaning of word. The close proximity between the different language ability groups shows little variation between them. This is a similar pattern for using *Te Aka* to find how to use a word in a sentence. Research, homework and finding where to place a macron show the biggest variations between the different language ability groups.

Figure F9: How is *Te Aka* and/or the *Te Reo Māori* app helping you to learn the Māori language? By ability in the Māori language
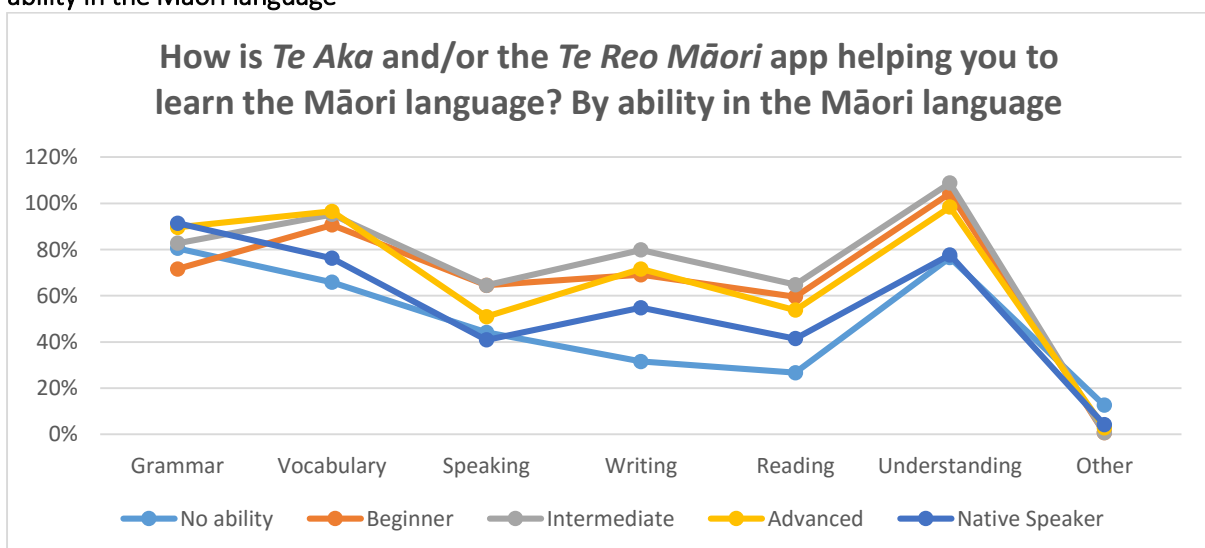
The line graph shows some variation between the different language ability groups for the different skills required to communicate in Māori and to be literate in Māori, that is, knowledge of grammar, vocabulary, speaking, writing, reading and understanding. Overall the data shows that each skill is highly important to the user.

Status of the Māori language by age groups and ethnic groups

Figure F10: Mean scores of respondents' ability in the Māori language by Age groups and selected Ethnic groups

Mean scores of respondents' ability in the Māori language by Age groups and selected Ethnic groups

Legend: New Zealand European/Pākehā, Māori
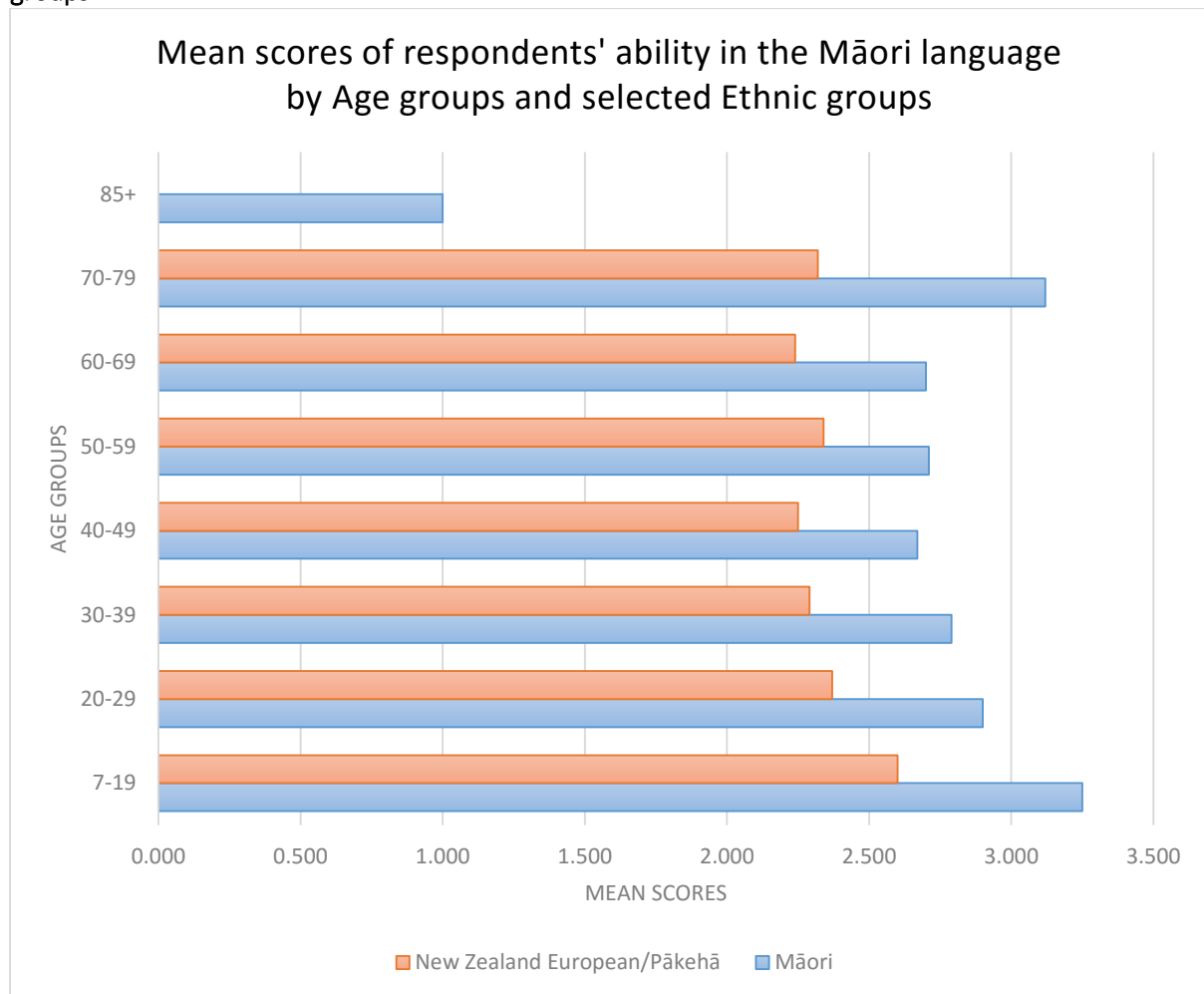
On a scale of 1-5, 1 being No ability and 5 being a Native Speaker in the Māori language, the highest score by age group and ethnic group are Māori, aged 7-19. This means this group are more likely to have a better than intermediate level of ability in the Māori language. The group with the lowest mean score are Māori in the 85+ age group, mean score of 1.

Figure F11: Mean scores of respondents able to hold a conversation in Māori about a lot of everyday things by Age groups and selected Ethnic groups

Mean scores of respondents able to hold a conversation in Māori about a lot of everyday things by Age groups and selected Ethnic groups
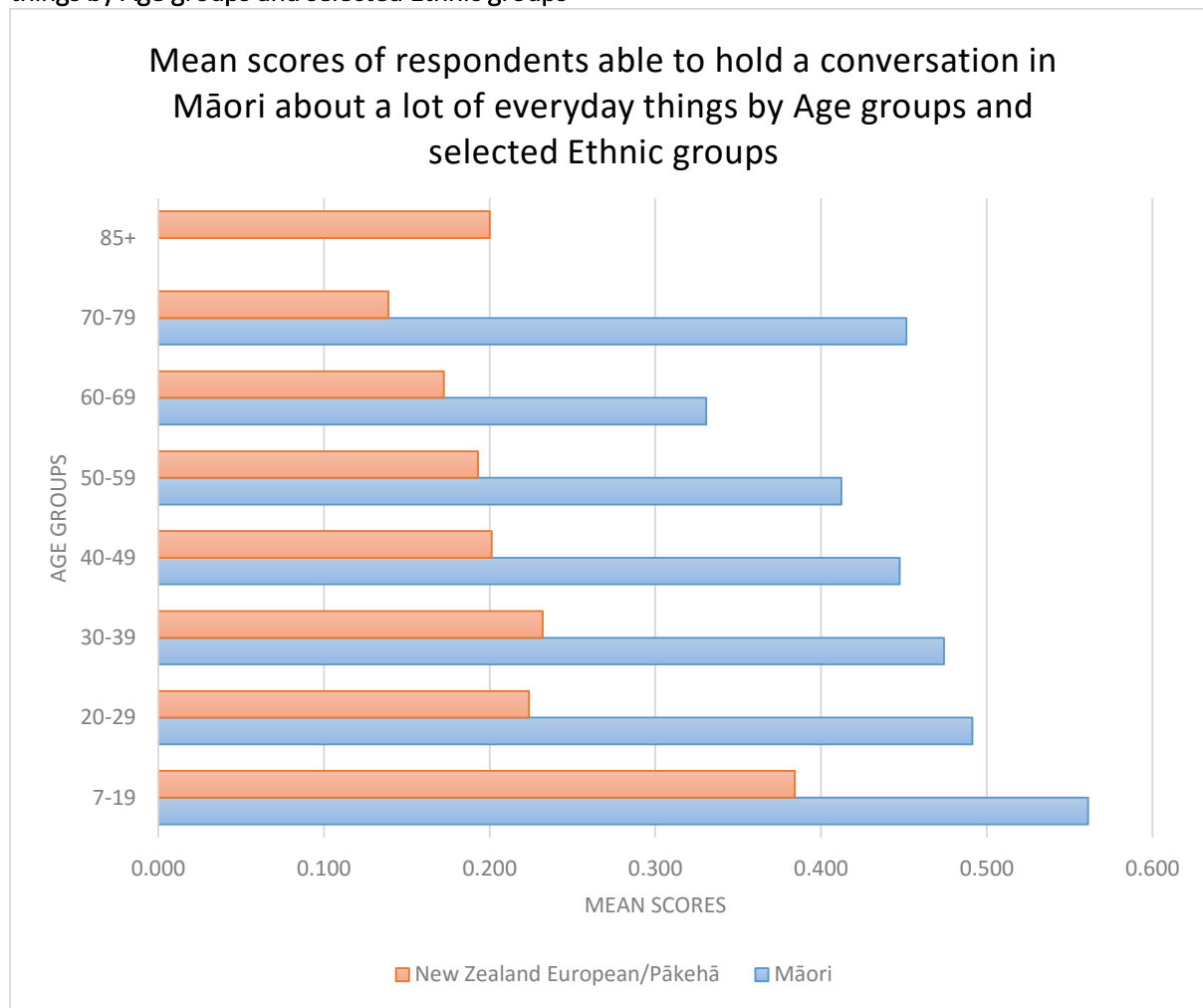
- The highest mean score for respondents able to hold a conversation in Māori by age group and ethnic group are Māori, aged 7-19, a mean score of 0.561. This means of half or 56% of this group are more likely to be able to have a conversation in Māori.

- The group with the lowest mean score are Pākehā, 70-79 age group, mean score of 0.139 or 13%.

- In all age groups, except 85+ Māori have higher mean scores than Pākehā.

*For what **purpose** is* Te Aka *and/or the* Te Reo Māori *app being used?*
The following tables consist of mean scores for a selection of tables from selected reasons why respondents use *Te Aka* and/or the *Te Reo Māori* app and selected abilities in the Māori language. The tables are further analysed by age group and selected ethnic groups.

Meaning of a word

Table F2: Means table of finding the meaning of a word using *Te Aka* and/or the *Te Reo Māori* app by Advanced level of te reo Māori by Age groups by selected Ethnic groups

		to find the meaning of a word							
	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Advanced	Māori	0.732	0.960	0.928	0.963	0.904	1.000	1.000	-
	New Zealand European/Pākehā	0.889	0.800	1.000	0.923	1.000	1.000	1.000	-

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.017

- Māori aged 7-19 with advanced te reo Māori had the lowest mean score of 0.732 or 73.2% for using *Te Aka* to find a meaning of a word compared to 0.889 or 88.9% of Pākehā is the same age group.

- All Māori and Pākehā aged 60-79 with advanced te reo Māori indicated they use *Te Aka* to find a meaning of a word, mean score of 1.

Use of a word in a sentence

Table F3: Means table of finding how to use a word in a sentence using *Te Aka* and/or the *Te Reo Māori* app by Beginner level of te reo Māori by Age groups by selected Ethnic groups

		to find how to use a word in a sentence							
	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Beginner	Māori	0.432	0.561	0.546	0.606	0.745	0.691	0.500	-
	New Zealand European/Pākehā	0.424	0.519	0.444	0.491	0.516	0.415	0.286	0.000

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.028

- Pākehā aged 70-79 with beginner level Māori language had the lowest mean score of 0.286 or 28.6% for using *Te Aka* to find how to use in a sentence compared to Māori aged 50-59 with the highest mean score of 0.745 or 74.5%.

- Pākehā aged 80+ with beginner level Māori language do not use *Te Aka* to find a meaning of a word, mean score of 0.

Table F4: Means table of finding how to use a word in a sentence using *Te Aka* and/or the *Te Reo Māori* app by Intermediate level of te reo Māori by Age groups by selected Ethnic groups

to find how to use a word in a sentence

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Intermediate	Māori	0.421	0.533	0.558	0.628	0.682	0.844	0.571	-
	New Zealand European/Pākehā	0.492	0.604	0.509	0.623	0.745	0.640	0.833	-

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.028

- Māori aged 7-19 with intermediate level Māori language had the lowest mean score of 0.421 or 42.1% for using *Te Aka* to find how to use a word in a sentence Māori aged 60-69 with the highest mean score of 0.844 or 84.4%.

Table F5: Means table of finding how to use a word in a sentence using *Te Aka* and/or the *Te Reo Māori* app by Advanced level of te reo Māori & Age groups & selected Ethnic groups

to find how to use a word in a sentence

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Advanced	Māori	0.211	0.380	0.435	0.648	0.692	0.500	1.000	-
	New Zealand European/Pākehā	0.222	0.400	0.625	0.461	0.444	1.000	1.000	-

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.028

- Māori and Pākehā aged 7-19 with advanced level Māori language had the lowest mean scores of for all age groups, 0.211 and 0.222 respectively.
- All Māori and Pākehā aged 70-79 with advanced level Māori language indicated they use *Te Aka* to find how to use a word in a sentence.

Table F6: Means table for use in research using *Te Aka* and/or the *Te Reo Māori* app by Native Speaker of te reo Māori by Age groups by selected Ethnic groups

research

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Native Speaker	Māori	0.475	0.469	0.286	0.250	0.600	0.286	0.667	-
	New Zealand European/Pākehā	0.667	0.714	0.667	-	0.333	0.000	-	-

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.024

- Māori aged 40-49 Native Speakers had the lowest mean score of 0.250 or 25% for using *Te Aka* for use in research compared to 0.714 or 71.4% by Pākehā aged 20-29 with the highest mean score.

- Māori aged 30-39 and 60-69 Native Speakers, also had low mean scores, both 0.286 or 28.6%.

How is Te Aka *and/or the* Te Reo Māori *app **helping to learn** the Māori Language?*

The following tables consist of mean scores for a selection of tables from selected uses of respondents using *Te Aka* and/or the *Te Reo Māori* app to learn the Māori language and selected abilities in the Māori language. The tables are further analysed by age group and selected ethnic groups.

Grammar

Table F7: Means table of how using *Te Aka* and/or the *Te Reo Māori* app helps to learn the Māori language for Grammar by No Ability of te reo Māori by Age groups by selected Ethnic groups

Grammar

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
No Ability	Māori	0.500	0.444	0.778	0.722	0.615	0.625	0.333	1.000
	New Zealand European/Pākehā	0.539	0.500	0.667	0.692	0.600	0.556	0.889	0.500

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.024

- Māori aged 70-79 with no ability in the Māori language had the lowest mean score of 0.333 or 33.3% by attempting to improve their knowledge of grammar by using *Te Aka* compared to 0.889 or 88.9% of Pākehā in the same age group.

Vocabulary

Table F8: Means table of how using *Te Aka* and/or the *Te Reo Māori* app helps to learn the Māori language for Vocabluary by No Ability of te reo Māori by Age groups by selected Ethnic groups

<div style="text-align:center">Vocabulary</div>

Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Māori	0.556	0.444	1.000	0.556	0.462	0.750	0.333	0.000
New Zealand European/Pākehā	0.385	0.625	0.600	0.615	0.700	0.444	0.556	0.000

(Row label: No Ability)

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.030

- Māori and Pākehā aged 70-79 with no ability in the Māori language do not use *Te Aka* to help improve their learning of vocabulary in the Māori language.

Section 2: Attitudes towards te reo Māori

Social inclusion

Second language learners who are immersed in learning the language are "adopting cultural values of the target language group" (Te Huia, 2015, p.25), where they not only learn the language but they are able to invest in meaningful relationships with other Māori "in order to enhance their collective identity as Māori" (Te Huia, 2015, p.25). Fishman (1989) suggests that in order for Māori to become proficient speakers that are of high regard, it is necessary that they are immersed in environments where there are other language speakers. Similarly, Te Huia (2015) discusses that in order for Māori to be able to embrace their culture and language they must be immersed in an environment where being Māori is actively supported, such as language transmission within homes (de Bres, 2011a). This will support the development of proficiency among second language speakers.

Interactions with other Māori who support the learning of the language and culture, would result in the motivation needed to continue learning the Māori language, proving positive effects for the understanding of the Māori language, culture and its speakers (Te Huia, 2014).

Ethnic groups

Table F9: Responses towards the Māori language being compulsory in New Zealand primary schools and towards the Māori language being an important part of New Zealand's national identity by selected Ethnic groups

Ethnic Group		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Māori	Māori language being compulsory in New Zealand primary schools. [1]	8.40%	2.30%	5.80%	22.30%	61.10%
	Māori language is an important part of New Zealand's national identity. [2]	3.70%	0.40%	1.40%	11.00%	83.60%
New Zealand European/Pākehā	Māori language being compulsory in New Zealand primary schools. [1]	4.70%	2.50%	12.50%	29.10%	51.10%
	Māori language is an important part of New Zealand's national identity. [2]	2.30%	0.70%	3.30%	20.50%	73.30%
Other	Māori language being compulsory in New Zealand primary schools. [1]	3.60%	0.50%	17.90%	28.60%	49.50%
	Māori language is an important part of New Zealand's national identity. [2]	2.60%	0.00%	7.20%	18.50%	71.80%
[1] Pearson Chi-Square Sig = 0.000 ETA = 0.024; [2] Pearson Chi-Square Sig = 0.000 ETA = 0.056						

Table F9 shows a breakdown of the results for the attitude questions asked in the survey by ethnic group. The results show that 83.4% of Māori (agree and strongly agree) that the Māori language should be compulsory in New Zealand primary schools compared to Pākehā with 80.2% and Other ethnic group with 78.1%. 94.6% of Māori (agree and strongly agree) that the Māori language is an important part of New Zealand's national identity compared to Pākehā with 93.8% and Other ethnic group with 90.3%. Figure F12 shows Māori are proportionately represented higher in 'strongly disagree' than Pākehā (Māori 8.4%, Pākehā 4.7%). Figure 13 shows Pākehā and Other ethnicities are proportionately represented higher in 'neutral' than Māori (Pākehā 12.5%, Other 17.9%, Māori 5.8%). Figure 12 hows Pākehā and Other ethnicities are proportionately represented higher in 'neutral' than Māori (Pākehā 12.5%, Other 17.9%, Māori 5.8%).

Figure F12: Attitudes towards te reo Māori by Māori ethnic group
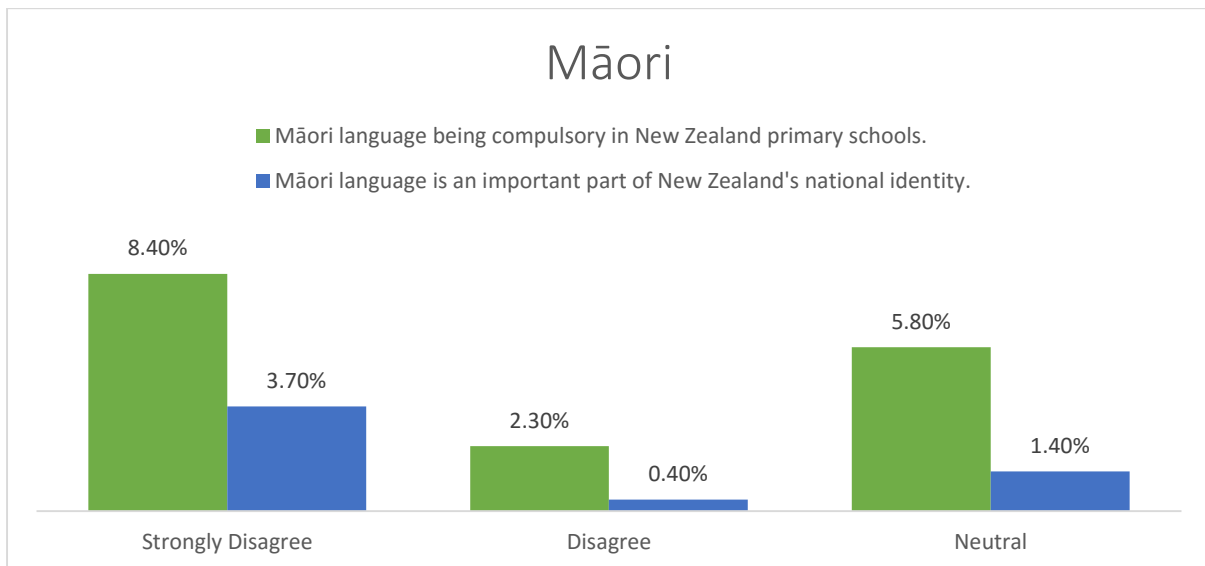
Figure F13: Attitudes towards te reo Māori by Pākehā ethnic group

New Zealand European/Pākehā

- ■ Māori language being compulsory in New Zealand primary schools.
- ■ Māori language is an important part of New Zealand's national identity.

	Strongly Disagree	Disagree	Neutral
Compulsory in primary schools	4.70%	2.50%	12.50%
Important part of national identity	2.30%	0.70%	3.30%
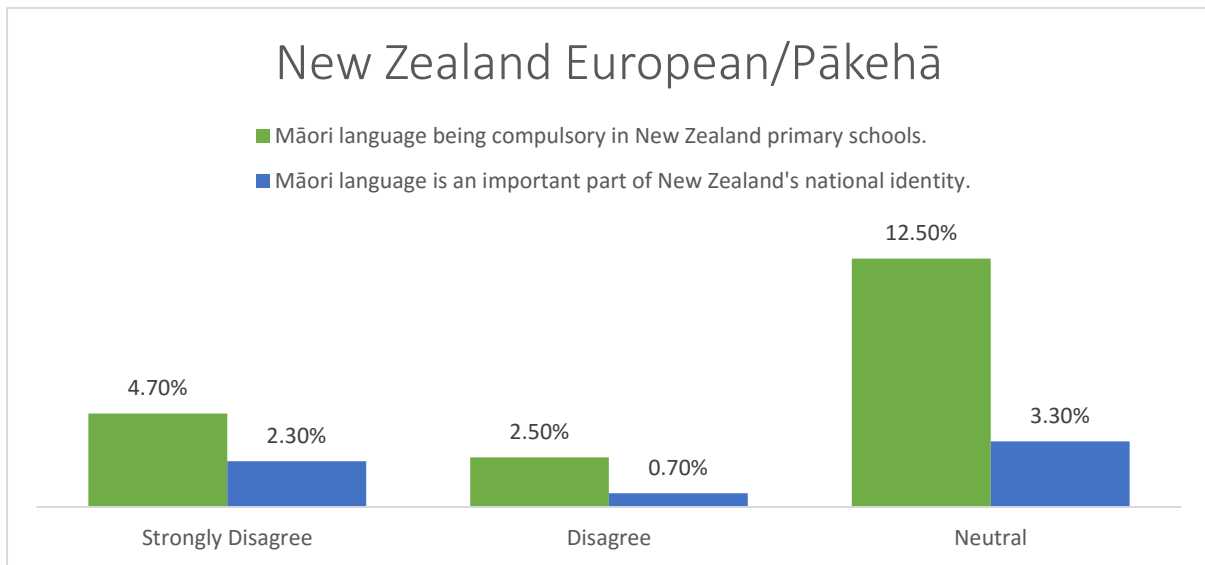
Figure F14: Attitudes towards te reo Māori by Other ethnic group

Other

- ■ Māori language being compulsory in New Zealand primary schools.
- ■ Māori language is an important part of New Zealand's national identity.

	Strongly Disagree	Disagree	Neutral
Compulsory in primary schools	3.60%	0.50%	17.90%
Important part of national identity	2.60%	0.00%	7.20%
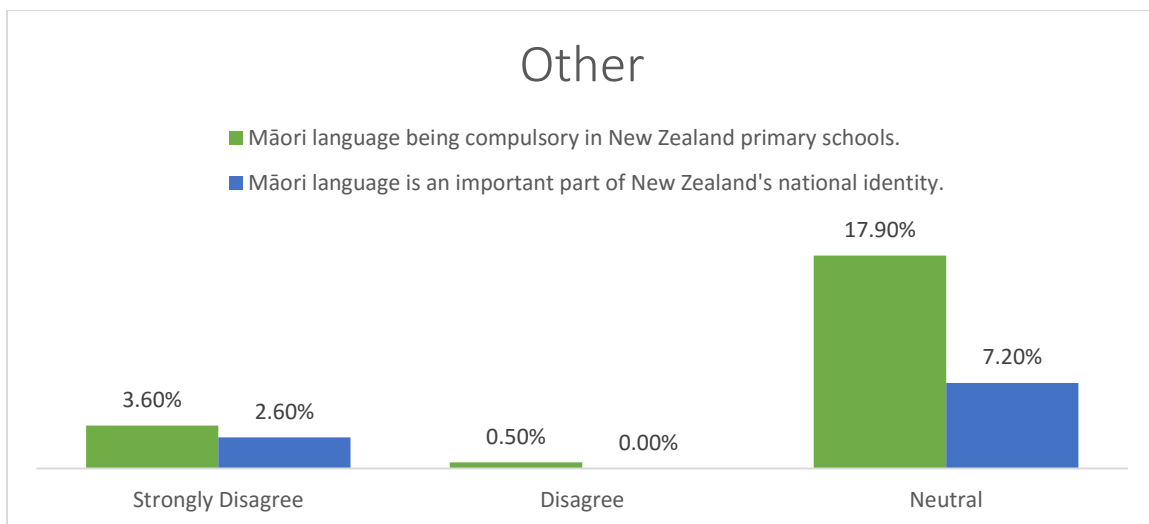
Age groups

Table F10: Responses towards Māori language being compulsory in New Zealand primary schools by Age groups

How do you feel about the Māori language being compulsory in New Zealand primary schools?								
Age group								
	7-19	**20-29**	**30-39**	**40-49**	**50-59**	**60-69**	**70-79**	**85+**
Strongly Disagree	8.90%	8.40%	6.70%	7.70%	5.50%	3.90%	8.20%	-
Disagree	2.40%	1.40%	3.10%	2.10%	2.40%	2.60%	1.20%	-
Neutral	11.90%	7.60%	6.00%	5.90%	7.60%	10.40%	22.40%	65.90%
Agree	22.20%	17.10%	21.70%	24.70%	31.10%	32.90%	38.80%	34.10%
Strongly Agree	54.50%	65.50%	62.50%	59.60%	53.50%	50.20%	29.40%	-
Pearson Chi-Square Sig = 0.000 ETA = 0.117								

Table F10 shows a breakdown of the results for the attitude questions asked in the survey by age group. The results show that the 50-59 age groups have the highest proportion of agree and strongly agree for the Māori language being compulsory in New Zealand primary schools (84.6%). This age group is followed by 40-49 (84.3%), 30-39 (84.2%), 20-29 (82.6%) and 7-19 (76.7%). Figure F15 shows the 85+ age group- 65.9% are neutral and 34.1% agree. In this age group none featured in the category, strongly agree. Figure F16 shows the age groups 20 -29, 30-39, 40-49 all registered over 80% in the strongly agree category. It then dropped off for the following age groups 50-59, 60 -69, and 70 -79.

Figure F15: Responses towards Māori language being compulsory in New Zealand primary schools by Age groups
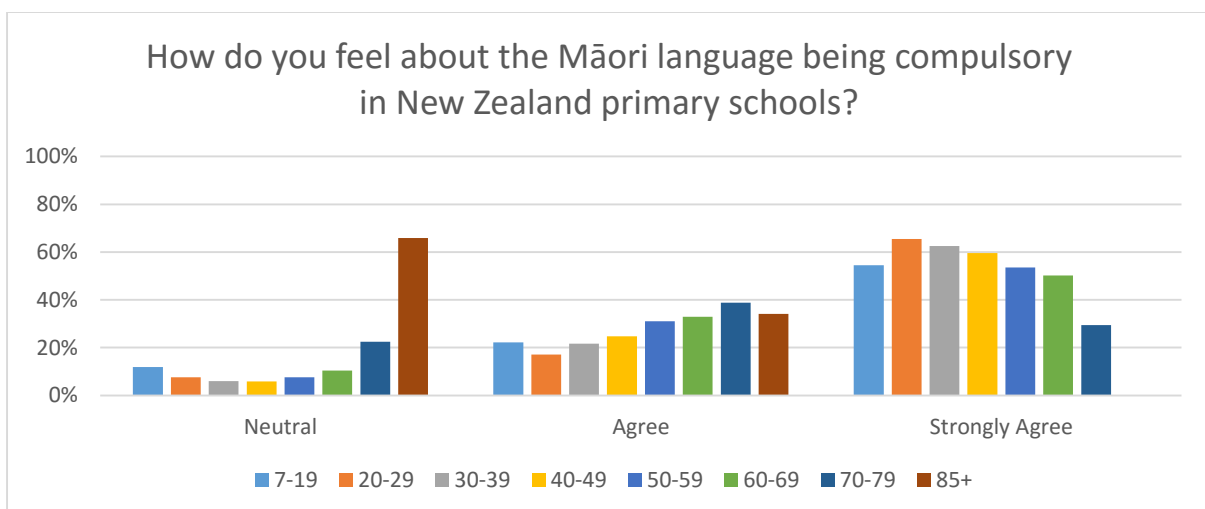
Figure F16: Responses towards Māori language being an important part of New Zealand's national identity by Age groups

Do you think the Māori language is an important part of New Zealand's national identity?
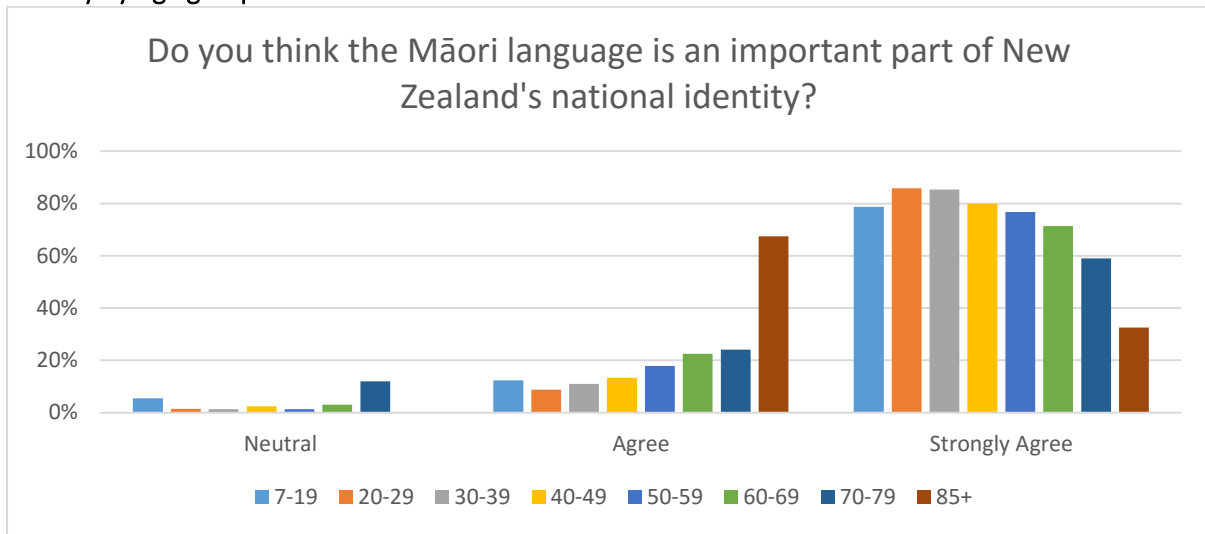
Table F11: Responses towards Māori language being an important part of New Zealand's national identity by Age groups

Do you think the Māori language is an important part of New Zealand's national identity?								
Age group								
	7-19	20-29	30-39	40-49	50-59	60-69	70-79	85+
Strongly Disagree	2.50%	3.40%	2.30%	4.30%	3.30%	2.20%	4.80%	-
Disagree	1.10%	0.60%	0.10%	-	0.80%	0.90%	-	-
Neutral	5.40%	1.40%	1.30%	2.40%	1.30%	3.00%	12.00%	-
Agree	12.30%	8.80%	11.00%	13.30%	17.80%	22.50%	24.10%	67.50%
Strongly Agree	78.70%	85.80%	85.30%	80.00%	76.80%	71.40%	59.00%	32.50%
Pearson Chi-Square Sig = 0.000 ETA = 0.107								

- The 85+ age group registered 67.5% in the agree category and 32.5% in the strongly agree category. In this age group, none featured in the strongly disagree, disagree or neutral categories.

*How do you feel about the Māori language being **compulsory** in New Zealand primary schools?*
The following tables consist of mean scores of respondents' views towards the Māori language being compulsory in New Zealand primary schools and selected abilities in the Māori language. The tables are further analysed by age group and selected ethnic groups.

Table F12: Means table of the Māori language being compulsory in New Zealand primary schools by No Ability of te reo Māori by Age groups by selected Ethnic groups

How do you feel about the Māori language being compulsory in New Zealand primary schools?

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
No Ability	Māori	3.21	4.44	4.33	4.25	3.82	4.50	4.00	4.00
	New Zealand European/Pākehā	2.50	4.60	3.85	4.05	3.22	3.25	3.75	4.00

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.014

On a scale of 1-5, 1 being strongly disagree and 5 being strongly agree with the Māori language being compulsory in New Zealand primary schools, Pākehā aged 7-19 with no ability in the Māori language recorded the lowest mean score 2.50. This means this group are more likely to to remain neutral or disagree that the Māori language is compulsory in New Zealand primary schools.

Table F13: Means table of the Māori language being compulsory in New Zealand primary schools by Native Speaker of te reo Māori by Age groups by selected Ethnic groups

How do you feel about the Māori language being compulsory in New Zealand primary schools?

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Native Speaker	Māori	3.96	4.47	4.09	3.33	5.00	4.67	3.40	-
	New Zealand European/Pākehā	3.56	4.67	4.50	-	5.00	-	-	-

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.014

On a scale of 1-5, 1 being strongly disagree and 5 being strongly agree with the Māori language being compulsory in New Zealand primary schools, Māori and Pākehā aged 50-59 native speakers of the Māori language recorded the highest mean scores 5.00 respectively. This means this group featured in the strongly agree category supporting that the Māori language is compulsory in New Zealand primary schools.

*Do you think the Māori language is an important part of New Zealand's **national identity**?*

The following tables consist of mean scores of respondents' views towards the Māori language being an important part of New Zealand national identity and selected abilities in the Māori language. The tables are further analysed by age group and selected ethnic groups.

Table F14: Means table of the Māori language being part of New Zealand's national identity by No Ability of te reo Māori by Age groups by selected Ethnic groups

Do you think the Māori language is an important part of New Zealand's national identity?

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
No Ability	Māori	3.79	4.78	5.00	4.81	4.45	4.63	4.00	4.00
	New Zealand European/Pākehā	3.58	4.80	4.54	4.50	3.78	3.88	4.57	4.00

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.008

On a scale of 1-5, 1 being strongly disagree and 5 being strongly agree with the Māori language being an important part of New Zealand's national identity, Pākehā aged 7-19 with no ability in the Māori language recorded the lowest mean score 3.58. This means this group are more likely to to remain neutral that the Māori language is an important part of New Zealand's national identity.

Table F15: Means table of the Māori language being part of New Zealand's national identity by Native Speaker of te reo Māori by Age groups by selected Ethnic groups

Do you think the Māori language is an important part of New Zealand's national identity?

	Age	7-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Native Speaker	Māori	4.69	4.90	5.00	4.67	5.00	4.83	3.60	-
	New Zealand European/Pākehā	4.44	4.83	4.50	-	5.00	-	-	-

ANOVA Between Groups (combined) Sig. = 0.000

ETA = 0.008

On a scale of 1-5, 1 being strongly disagree and 5 being strongly agree with the Māori language being an important part of New Zealand's national identity, Māori and Pākehā aged 50-59 Native Speakers of the Māori language recorded the highest mean scores 5.00 respectively. This means this group featured in the strongly agree category that the Māori language is an important part of New Zealand's national identity.

Concluding comments

An important aspect of using a quantitative approach to this study is that the data from the pop-up survey questions can be cross tabulated with other variables. Only a selection of these variables have been utilised for this report; a mix of independent variables and dependent variables. Independent variables used include the age of the respondent, country of birth of the respondent, ethnic group of the respondent, educational qualification of the respondent and occupation of the respondent. Dependent variables include the respondent's self-assessment of their ability in the Māori language, how well the respondent is able to speak Māori in everyday conversation, how the respondent feels about the Māori language being compulsory in New Zealand primary schools, how the respondent thinks about the Māori language being an important part of New Zealand national identity, for what purpose respondents are using the dictionary and how the dictionary is helping the respondent to learn the Māori language.

The selection of variables is informed by the choice of questions identified by Te Taura Whiri i te Reo Māori for the purposes of this report. Cross-tabulations and Means Analysis have enabled the researchers to drill down to the lowest denominator, giving detailed insight into the 'users' of *Te Aka* and/or the *Te Reo Māori* app, and what underpins the 'users' interest in the Māori language. This information can inform further research including how *Te Aka* and/or the *Te Reo Māori* app can be improved to further support 'users' of these digital devices.

Chapter Six: Analysis and Discussion

Introduction

The findings of the *Te Aka* pop-up survey, together with the Google Analytics data available to the researchers, provide valuable evidence of usage, trends and patterns of users of *Te Aka Māori – English, English - Māori* online dictionary, specifically learners of te reo Māori. The findings of the research will be discussed in this chapter.

Usage of the *Te Aka* Online Dictionary[2]

As mentioned briefly in the introductory chapter, for the year ending 22 June 2016, Google Analytics for the *Te Aka* website shows that it received 3,485,800 visits from 224 countries. Of those, 1,397,353 were unique visitors. Further details show that 3,015,800 (86.51%) of visits to the website were from Aotearoa/New Zealand, with over 1 million (1,027,477) unique users, with Australia being the next biggest user with 249,127 (7.15%) visits (see figure D1). Notably, while the time spent on each visit by all visitors was an average of 5:52 minutes, for Aotearoa/New Zealand users it was somewhat higher at 6:16 minutes, perhaps because some of the users were engaged in formal and more intensive Māori language learning. The average time spent by users from other countries was much lower, e.g. for Australia it was 3:42 minutes.

The rapidly increasing use of the *Te Aka* website since it was first launched can be demonstrated by a quick study of the comparison of the number of visits to the website for the year ending 22 June 2016 with the same period for the previous year, when the number of users was 2,728,690, an increase of 27.75%. The number of unique visitors to the website has increased by even more at 28.79%. This dramatic yearly growth in usage of the website has been a feature since the first year of the website's existence. No doubt this growth owes something to the steady expansion of the dictionary, both in the number of headwords and subentries, and in the additional material, such as example sentences and translations, photographs, and the audio for the sounds of the fauna and the pronunciation of each word.

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[2] All data in this section is from the Google Analytics for the *Te Aka* online website.

Figure D1: *Te Aka* online dictionary - Comparison of year ending 22 June 2016 with the previous year
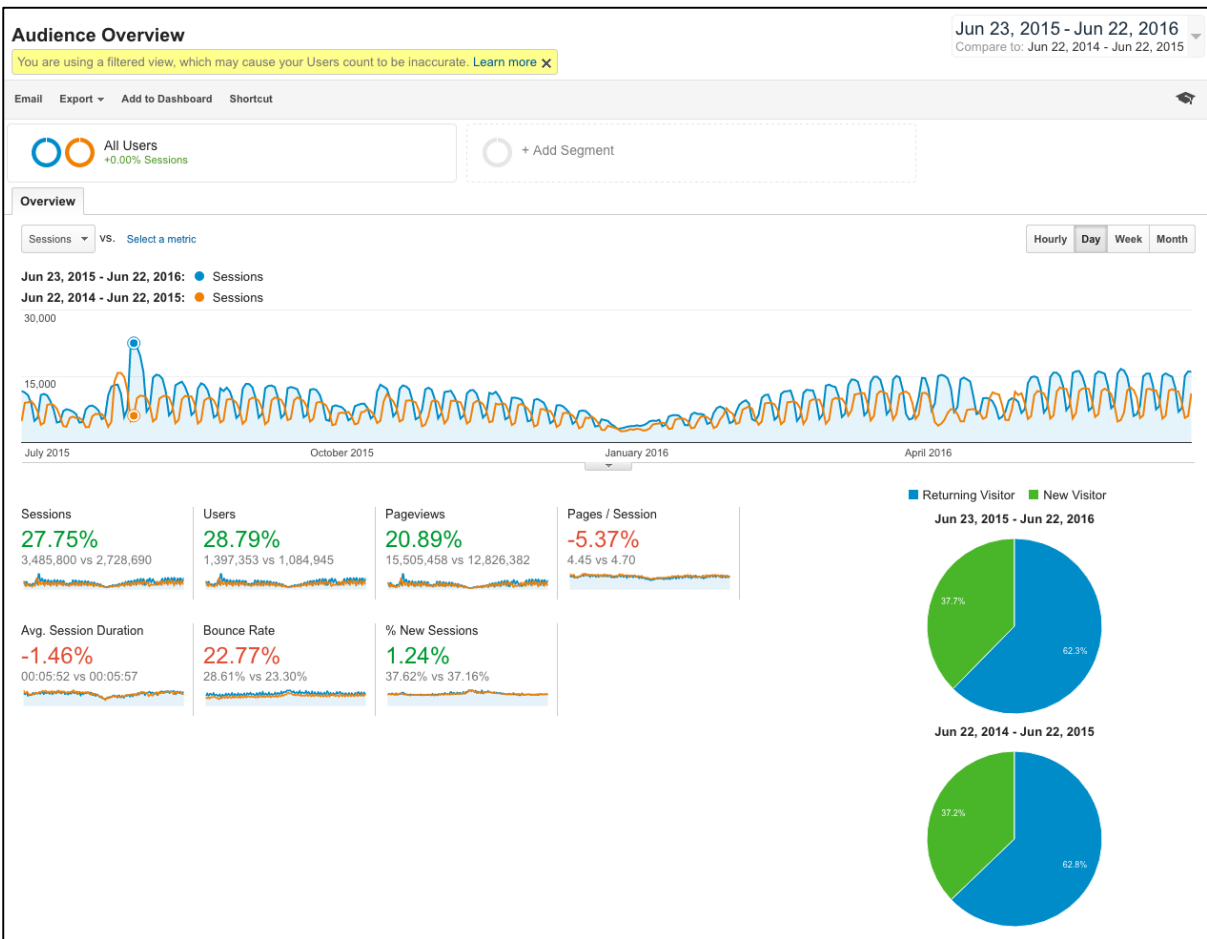
A further notable feature of the usage of the website is that each year the daily number of visits peaks on the days of Māori Language Week. In 2015 the highest number of visits for a single day was on Tuesday 28 July, the Tuesday of Māori Language Week, when there were 22,484 visits. Although the number of visits drops back after Māori Language Week, the interesting feature is that the number of visits each day rarely drops below the levels in the weeks prior to Māori Language Week or to the numbers of the same period for the previous year. This provides strong evidence for the interest and continuing benefits to the Māori language of its promotion during Māori Language Week. This can be quantified by comparing visits to the website for the eight weeks after Māori Language Week (3 Aug, 2015 - 27 Sep, 2015) with the eight weeks before it (31 May, 2015 - 25 July, 2015) (see Figure D2). This reveals a 19.33% increase (585,444 visits) in visits to the website in the eight-week period after Māori Language Week compared with the eight-week period before it (490,612 visits) and an increase in the number of users of 32,299, a 13.89% increase. Thus, not only was there an increase in the number of users, but there was an even bigger increase in the number of times those users were accessing the

website, shown by an increase of 22.91% in the number of page views and a 3.0% increase in the page views per session. This is testiment to the benefits in promoting Māori language during Māori Language Week.

Figure D2: Comparison of *Te Aka* usage before and after Māori Language Week

(Source: https://analytics.google.com/)
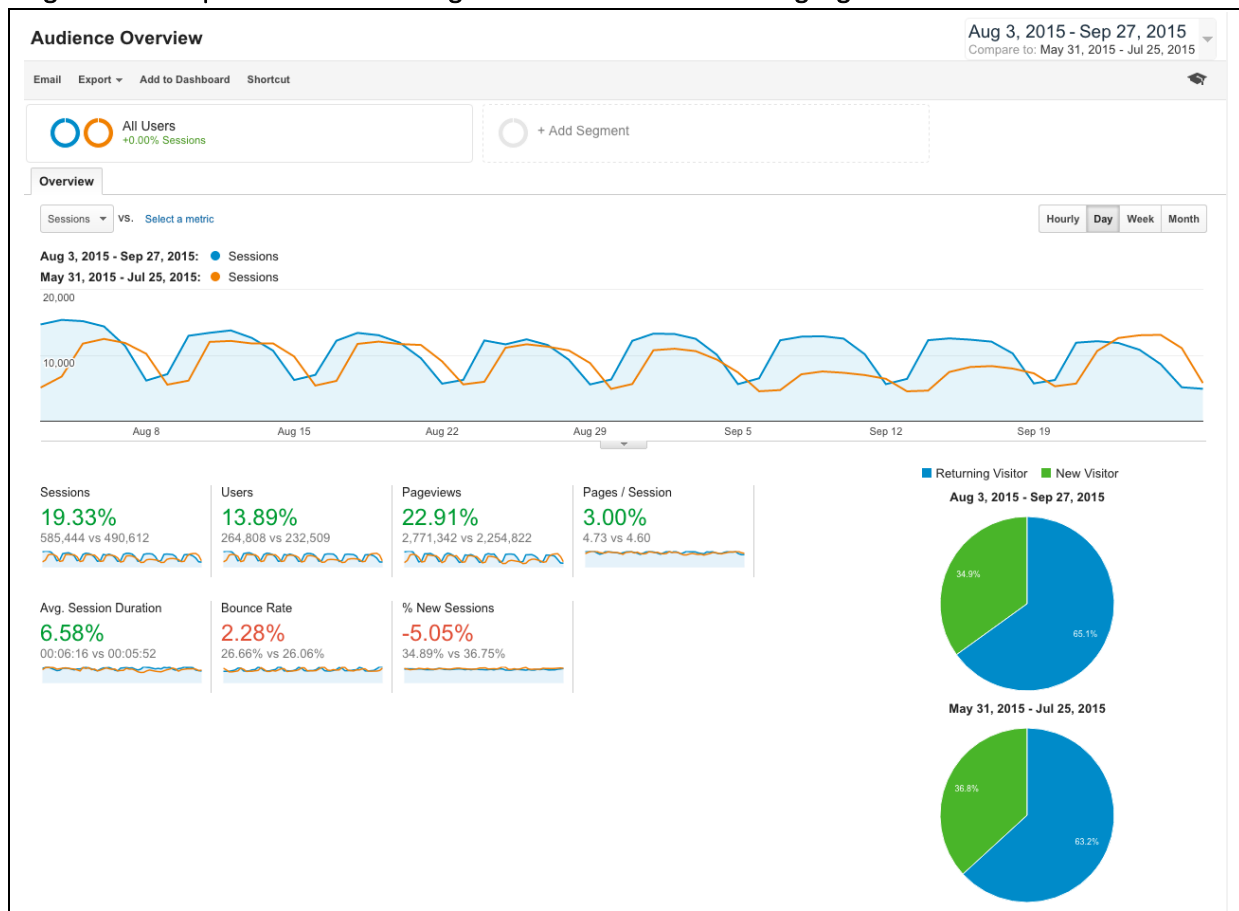
Of course, all these figures also show that online dictionaries are much more accessible than printed dictionaries. The figures also show the increasing popularity of the *Te Aka* website over any other dictionary, particularly when one Google searches 'maori dictionary' and *Te Aka* appears at the top of the list.

Reasons learners use the *Te Aka* and the *Te Reo Māori* app

Results from the survey reveal that the respondents' most frequently chosen reason for using the *Te Aka* and/or the *Te Reo Māori* app is for help in finding the meaning of new words. 84.7% of respondents included this as one of the reasons for accessing a digital form of the dictionary. This was the main reason for using the dictionary for all age groups and all levels of ability. This is not an unexpected result.

What is of more interest to the author of the dictionary is that the second reason most frequently provided about the purpose of using the digital dictionary is to find how to use a Māori word in a sentence. Having spent the last four years working intensively to add quality language example sentences for each subentry, with translations, to show how a particular word is used in context, the authorit is encouraged to know that these example sentences are being used to help improve users' Māori language ability. Nearly half of the users (48.6%) are making use of these example sentences to enable them to use a particular word correctly in speaking or writing Māori. When one delves further into the levels of users' abilities in the language, it is revealed that it is the beginner (44.1%) and intermediate learners (38.9%) who show the highest percentage of people using the example sentences. The advanced group shows a much lower percentage (10.5%). Very few of the No Ability group (4%) use the example sentences. Their lack of language makes the sentences of little benefit to them. Native speakers, the next lowest group using this feature (2.5%), are more secure in their knowledge of language usage, which means that they are less likely to need to check how to use a word. Looking at the different age groups, it is the 50-59 age group who use the dictionary most for finding how to use a word in a sentence, with 23.7% giving this reason. Their next most important reason for using the dictionary in their language learning is to find out where to place the macrons (43.4%). Across all the age groups, this 50-59 age group has the highest percentage (23.7%) using the the example sentences of the dictionary, with the 40-49 age group only slightly lower (23.5%).

The third reason most frequently given for using the dictionary (31.8%) is to find where to place the macrons. Because the search function of the dictionary ignores macrons, words can be entered with or without macrons and the results will show the word with the macrons in the correct place. This is a function particularly useful to the intermediate language ability group (43.7%), who are probably the users who are most aware of the need to mark vowel lengths correctly. Beginners are the next biggest group (37.4%). Only 13.7% of Advanced learners use the dictionary to find vowel length, probably because they already know the correct vowel lengths for most words they use. For native speakers there is, perhaps, less concern and awareness about marking macrons, or they already know the correct pronunciation, as only 2.9% of that group use the dictionary for this function. Only 2.3% of the No Ability group used the dictionary for this purpose, again suggesting a lack of awareness about the importance of marking vowel length.

A similar percentage (30.6%) also use the dictionary for research. One can assume that some of this research relates to the detailed explanations of key concepts of the culture and language included in the dictionary. Again there is considerable variation between the five groups. Unlike all the other levels

of ability, the Native speakers citeusing the dictionary for research as their second most important reason for using the dictionary, while using the dictionary for homework was their third most common use of the dictionary. This again reflects the different focus of some native speakers who are probably using the dictionary for expanding their vocabulary and for content, with less emphasis on developing their language skills, which are already well established.

General interest was given as one of the reasons for using the dictionary by 29.8% of respondents. Beginners are the highest proportion with 42.6%. Across all age groups, the 30-39 age group has the highest proportion of users who use the dictionary for general interest (22.9%).

Using the dictionary for homework was the sixth most important reason given for using the dictionary with 28.8%. These will all be users involved in educational institutions and Māori language classes.

Use of *Te Aka* and the *Te Reo Māori* app to learn the skills needed to communicate in Māori

In the survey the question was asked, "How is *Te Aka* and/or the *Te Reo Māori* app helping you learn the Māori language?" The options given to the respondents were the different skills required to communicate in Māori and to be literate in Māori, i.e. knowledge of grammar, vocabulary, speaking, writing, reading and understanding.

When investigating the contribution the dictionary makes in helping users learn these various language skills, the results from the survey show that respondents value the dictionary most for helping them with learning vocabulary, with 75.4% of them stating this. Again, this is a predictable result, given the traditional purpose of a dictionary. The surprise is that nearly 25% did not give this as a reason for using the dictionary.

Over half the respondents use the dictionary for helping them write the language (56.1%), and for learning the grammar of the language (55.5%). Using the dictionary for understanding (47.3%), for reading comprehension (46.4%), and for speaking (46.2%) is useful for just under half of the respondents.

While the line graph shows some variation between the language ability groups, overall the dictionary is useful for between 46.2% and 56.1% of users in each of these language skills (see Appendix 2).

Although the research results show variations between the ability groups, between the age groups, and between the ethnic origins of users in the importance they place on the value of the dictionary for each of the six skills identified for the survey, the differences are minor when compared with the overall value of the dictionary as an aid to learning the language. It is obvious from these results that for many learners and speakers of Māori, *Te Aka* serves a much greater function than to just look up the meaning of Māori words or to find equivalents of a word in Māori or English. Of the five ability groups identified, the intermediate, advanced and beginner groups show the highest proportions using *Te Aka* to develop their language skills.

Attitudes of users of *Te Aka Māori-English, English-Māori Dictionary*

Attitudes of users of *Te Aka Māori-English, English-Māori Dictionary* build on the many language revitalisation initiatives in the last forty years to rejuvenate the language, as discussed in Chapter Two. These initiatives and strategies have raised people's consciousness creating positive social impact on people's attitudes of the Māori language in Aotearoa/New Zealand where more and more people view the language as being an important part of New Zealand's national identity. Furthermore, these initiatives are changing the way the language is being perceived by both Māori and non-Māori within mainstream Aotearoa/New Zealand society. One can only surmise the state the language would be in if none of these initiatives had been implemented.

According to de Bres (2011a), the support for the language should be as a nation and not only from the minority group where, as it stands, the regeneration of the Māori language lies solely with Māori. These beliefs have arisen due to the influences of Western culture or from the effects of the historical events that impacted the language significantly through colonisation. However, the findings, albeit from the targeted population for this research being the 'users' of *Te Aka Māori-English, English-Māori Dictionary* online, show that these beliefs are changing. The findings show that there is a shift in attitudes towards the Māori language, in particular by those of the non-Māori population.

The status of te reo Māori in schools – compulsory or not?

The findings of the survey show an unexpected correlation between Pākehā and Māori respondents in that both cohorts of respondents agree that the Māori language should be made compulsory in New Zealand primary schools. Māori show the highest ratings in either agree or strongly agree with 83.4%. Pākehā respondents follow closely behind with either agree or strongly agree with 80.2%. Therefore, the findings of the survey clearly show a shift of attitudes in regard to whether or not te reo Māori should be made compulsory in primary schools, remembering that the target population of 'users' of

Te Aka for this survey already have an interest in the language as explained in Chapter One. This result shows that both Māori and Pākehā are seeing the value of their children having access to the Māori language at an early stage.

The most interesting statistic is when the data for strongly disagree, disagree and neutral for this question was further analysed by ethnicity. Results showed in proportion, more Māori are in the 'strongly disagree' category with 8.4% than Pākehā who showed 4.7%. This finding could be attributed to two factors, the first being that there is a view that by making the language compulsory it becomes a 'turn-off' and children become uninterested and disengaged. There are examples of this with other Indigenous languages such as in Ireland. Gaeilge, the native Irish language, is taught from junior infant level right up to Leaving Certificate level in Ireland (Citizen Information, n.d.). According to the 2011 Census, only 1.8% of the population speak Gaeilge every day outside of school (Citizen Information, n.d.). This raised an issue in 2013 over whether or not it was time for Gaeilge to be made optional in the Leaving Certificate or would it be the end of Gaeilge; that is, should it continue to be a compulsory subject taught in the equivalent of their secondary schools? (Citizen Information, n.d.). These debates continue to occur globally amongst endangered language speaking communities where English is the dominant language (Citizen Information, n.d.).

 The second factor follows on from the first and is based on the view that funding should be channelled solely into:
a) families who want to raise their children in the Māori language as native speakers and either home school them or have them educated in Māori-medium schools where the language is of a high quality reflecting the proficiency of the language of the parents in the home; and
b) educational initiatives within the community like Māori4Grownups, which supports families to raise their children in te reo Māori where there is a commitment to fostering the regeneration of the Māori language within their families through intergenerational language transmission.

This argument is premised on the notion that it is a waste of precious resources teaching the Māori language to a majority culture and population who have little or no interest in whether the language survives or dies when you can invest the resource wisely into initiatives and people already involved in leading language revitalisation in the homes, thus ensuring intergenerational transmission of the language within their *whānau* and communities.

Another interesting set of statistics is that Pākehā and Other Ethnicities are proportionately represented higher in the 'neutral' category, with Pākehā on 11.5%, Other on 17.9% and Māori on 5.8%. These results could be interpreted that neither Pākehā nor Other Ethnicities are bothered either way in terms of te reo Māori being a compulsory subject in New Zealand primary schools. This would mean that the move to introduce Māori as a compulsory subject in primary schools would not necessarily receive opposition from the New Zealand population and if adopted, this strategy could be regarded as a positive language revitalisation initiative supported by the State, thus reversing the historic role and perception the old Department of Education had in the decline of the Māori language. This in itself would have significant positive social impact on *te mana o te reo* (the status of the Māori language). Matika, Houkamau and Sibley (2016) in the New Zealand attitudes and values study, explained that by using a multiple regression model they could assess the extent to which various demographic factors were significantly associated with support for "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English". They were able to identify four significant factors in the study,

> A higher level of education, being younger, being a woman, and having interacted in the previous week with Māori peoples (either friends, family, work or other contexts) were the four strongest, statistically significant, factors associated with support for both "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English" (Matika, Houkamau and Sibley, 2016, Executive Summary).

While there were signficant differences in the support between "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English", across the regions Matika et al (2016) report that despite these regional differences, "there are still a lot of other potential factors that correlate with support for Te Reo that are not necessarily about region[s] per se" (Executive Summary).

New Zealand's national identity involves te reo Māori – yes or no?

It is argued that the Māori language gives New Zealand a unique language identity and is connected to cultural distinctiveness, especially in a contemporary context where mainstream Aotearoa/New Zealand is seeking to renegotiate and reclaim its past apropos of social and political circumstances such as Treaty of Waitangi Claims and recognition from the Crown of injustices committed in the past (Tokolyova, 2012; Te Huia, 2014).

Cultural, social, political and historical processes and issues are known to influence identity construction over time (Houkamau, 2010). Intergenerational changes in identity and wellbeing can be linked to these

issues. Houkamau (2010) also suggests that to 'really understand' Māori, and why they interpret their identities as they do, it is imperative to understand how lives are shaped by socio-historical conditions. However, understanding the cultural, social, political and historical issues of the 'users' of the *Te Aka* and the *Te Reo Māori* app is indeed difficult to ascertain from the findings, but some correlation can be made between the age of the respondents and cultural, social, political and historical processes and issues.

The findings of the survey show that both Pākehā and Māori respondents agree that Māori language is an important part of New Zealand's national identity. Māori show the highest rating with 94.6% either agree or strongly agree. Pākehā respondents follow closely behind with 93.8% registering either agree or strongly agree. The similarity between the results of both Māori and Pākehā cohorts can be understood from the perspective that the targeted population for this research is only 'users' of *Te Aka Māori-English, English-Māori Dictionary* online and therefore the 'users' are in some way engaged with te reo Māori either as learners of the language, as researchers, or as speakers of the language. We cannot assume that these statistics are representative of the views of all Pākehā and Māori. We can, however, claim that shifting attitudes towards the Māori language have influenced the way the general population views the relationship between New Zealand's national identity and te reo Māori.

An interesting statistic is revealed when the national identity data for strongly agree, agree and neutral was further analysed by age. Results show that within the 85+ age group of Māori and non-Māori, 67.5% registered as agree and 32.5% as strongly agree. Notably within this category, none registered as neutral or disagree or strongly disagree. This can be attributed to cultural, social, political and historical processes and issues that have impacted upon this age group in their lifetime regarding *te mana o te reo*. One of our researchers, a Pākehā, can track intergenerational changes in identity and the correlation with Māori language within his own family. His father, who is 103 years old and born in 1912, would have seen the Māori language being suppressed by the New Zealand government and English promoted through education and commerce. However, he heard Māori being spoken by the local community, especially as he lives in a rural community and attended a primary school that had a significant number of Māori pupils. This triggered an interest in the Māori language whereby he gave his two sons the opportunity to be educated at St Stephen's School in Bombay, South Auckland, where Māori was compulsory in the third and fourth forms and the roll was predominantly Māori. One of his sons, our researcher, was inspired by this experience to continue learning the language at university and went on to teach and then research the language at high school level and university. The Māori language is accepted by his sons and *mokopuna* (grandchildren) as part of their everyday life despite

not being bilingual like their father/grandfather. These circumstances illustrate how social circumstances can influence identity, as the researcher and his wife and sons certainly view the language as being an important part of New Zealand's national identity.

In addition, results for the 20s, 30s, and 40s age groups of Māori and non-Māori all rank over 80% in the strongly agree category. This then drops off slightly in the strongly agree category for the 50s age group with 76.8%, 71.4% for the 60s age group, and 59% for the 70s age group and the 85+ age group of 32.5%. Again this can be attributed to cultural, social, political and historical processes and issues that have impacted upon this age group in their lifetime regarding *te mana o te reo*. Significant changes in the law such as the 1987 Māori Language Act, changes in educational reform and policy such as the establishment of Te Kōhanga Reo, Kura Kaupapa Māori, and Māori-medium education, the establishment of Māori broadcasting agencies, including *iwi* radio and the Māori Television Channel, and the cultural renaissance in general spanning the last 50-60 years whereby Māori society has seen the revitalisation of *tā moko* (the art of Māori tattoo), the Māori performing arts and Māori compositions and popular music among the younger generation, have had a significant influence on 'normalising' the Māori language in mainstream New Zealand society.

Concluding Comments

Almost since the *Te Aka* dictionary went live at the end of 2006 there has been a spectacular and steady growth of the number of people using the dictionary. As the numbers grew, so did the research and work to improve the usefulness of the resource. We were able to quantify the increase in numbers, where the people lived who were using the dictionary, along with other information provided by Google Analytics. What we did not know was what the dictionary was being used for and the demographics of the users. We could presume that *Te Aka* was being used to find the meaning of Māori words and to find words with similar meanings between English and Māori, but what else were they using it for and were the users using it to develop their language skills? Was the immense amount of effort and research to add example sentences, with translations, of value or were these largely being ignored? As a result we decided to use an online survey to answer these and other questions. We decided too that it would be a good opportunity to gain some insight into the attitudes of the users of the dictionary towards the language.

The findings from this research have shown clearly that using the *Te Aka Māori-English, English-Māori Dictionary* online as a tool for language learning is enhanced because of the entries which contain much more information, including usage notes, example sentences, illustrations, encyclopaedic information

and audio clips. Therefore, it can be said that the *Te Aka Māori-English, English-Māori Dictionary* online is considered a valuable digital resource by the respondents to the survey in the preservation and revitalisation of the Māori language. Furthermore, the data also suggests that respondents to the survey see a significant relationship between te reo Māori and our national identity, thus supporting the language being made compulsory in primary schools. This is a real shift away from the way the Māori language has been seen by the majority population in the past and is part of our historical record.

On a final note, the data from this convenience sample provides a solid foundation from which to conduct a more statistically robust probability sample in 2017/2018. The results of this probability sample would allow the research team to apply statistical inference to the target population.

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Appendix 1: Survey questions

Survey Questions as they appeared on *Te Aka*: (Available on *Te Aka Māori Language Dictionary* online and the *Te Reo Māori dictionary* App)

Help us make your *Te Aka* and/or the *Te Reo Māori* app experience better. John C Moorfield
☐   Click here to continue
☐   No

1.   For what purpose are you using *Te Aka* and/or the *Te Reo Māori* app*?* (Please select all that apply)
☐ to find the meaning of a word or a Māori/English equivalent of a word
☐ to find how to use a word in a sentence
☐ research
☐ homework
☐ to find where to place the macrons
☐ general interest
Other (Please state) _ _ _ _ _ _ _ _ _ _ _ _ _
NEXT (1/18)

2.   Which ethnic group do you belong to? (Please select all that apply)
☐ New Zealand European/Pākehā
☐ Māori
Other (Please state) _ _ _ _ _ _ _ _ _ _ _ _ _
NEXT (2/18)

3.   Which country were you born in?
☐ New Zealand
☐ Australia
Other (Please state) _ _ _ _ _ _ _ _ _ _ _ _ _
NEXT (3/18)

4.   What year were you born?
NEXT (4/18)

5.   What is your highest qualification (for example no qualification, secondary school, tertiary, trade certificate etc.)
NEXT (5/18)

6.   What is your main occupation? (for example primary school teacher, university student, administrator)
NEXT (6/18)

7.   In which language[s] could you hold a conversation about a lot of everyday things? (Please select all that apply)
☐ English
☐ Māori
Other (Please state) _ _ _ _ _ _ _ _ _ _ _ _ _
NEXT (7/18)

8.   Rate your ability in the Māori language.
☐ No ability
☐ Beginner
☐ Intermediate

□ Advanced
□ Native Speaker

9.   How is *Te Aka* and/or the *Te Reo Māori* app helping you to learn the Māori language? (Please select all that apply)
□ Grammar
□ Vocabulary
□ Speaking
□ Writing
□ Reading
□ Understanding
Other (Please state) _ _ _ _ _ _ _ _ _ _ _ _ _ _
NEXT (9/18)

10.   How well are you able to speak Māori in everyday conversation?
□ Very well (I can talk about almost anything in Māori)
□ Well (I can talk about many things in Māori)
□ Fairly well (I can talk about some things in Māori)
□ Not very well (I can only talk about simple/basic things in Māori)
□ No more than a few words or phrases.

11.   How well are you able to understand spoken Māori?
□ Very well (I can understand almost anything said in Māori)
□ Well (I can understand many things said in Māori)
□ Fairly well (I can understand some things said in Māori)
□ Not very well (I can only understand simple/basic things said in Māori)
□ No more than a few words or phrases.

12.   How well are you able to read Māori with understanding?
□ Very well (I can read almost anything in Māori)
□ Well (I can read many things in Māori)
□ Fairly well (I can read some things in Māori)
□ Not very well (I can only read simple/basic things in Māori)
□ No more than a few words or phrases.

13.   How do you feel about the Māori language being compulsory in New Zealand primary schools?
□ Strongly Disagree
□ Disagree
□ Neutral
□ Agree
□ Strongly Agree

14.   Do you think the Māori language is an important part of New Zealand's national identity?
□ Strongly Disagree
□ Disagree
□ Neutral
□ Agree
□ Strongly Agree

15.   How well are you able to write in Māori, with understanding?
□ Very well (I can write almost anything in Māori)

□ Well (I can write many things in Māori)
□ Fairly well (I can write some things in Māori)
□ Not very well (I can only write simple/basic things in Māori)
□ No more than a few words or phrases.

16. Do you use *Te Whanake* hard copy resources such as the Study Guides and Textbooks?
□ Yes
□ No (Please explain) _ _ _ _ _ _ _ _ _ _ _ _ _
NEXT (16/18)

17. Do you use *Te Whanake* digital resources such as the *Te Whanake Animations*, *Tōku Reo* and *Te Whanake Podcasts*?
□ Yes
□ No (Please explain) _ _ _ _ _ _ _ _ _ _ _ _ _
NEXT (17/18)

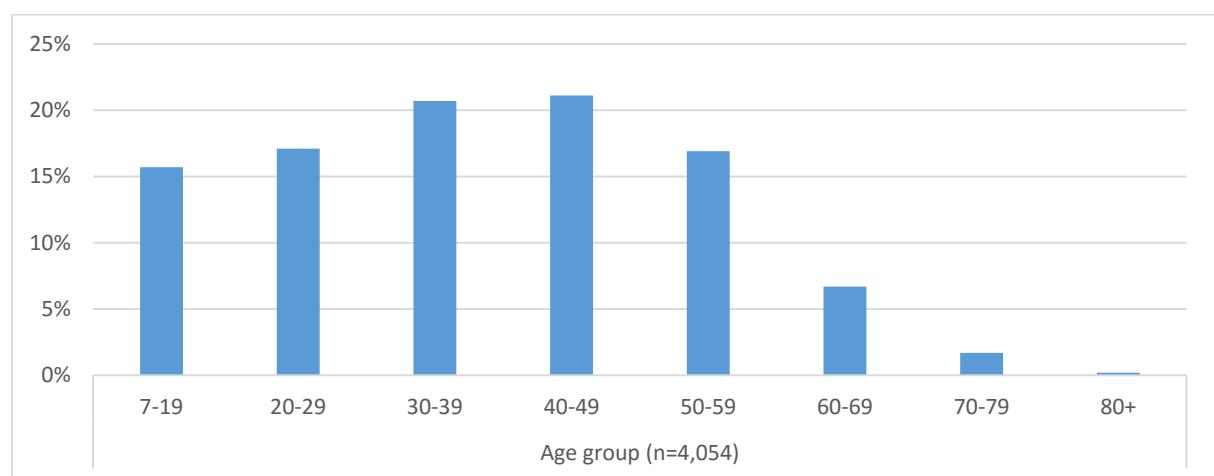**18.** Why do you choose to use *Te Aka* and/or the *Te Reo Māori* app? (Please select all that apply)
□ Easy access
□ Current
□ Inclusion of digital assets eg images and audio
□ Mobility and convenience
□ Reliable information
□ Accurate information on key Māori concepts
□ Dictionary usually provides a search result
Other (Please state) _ _ _ _ _ _ _ _ _ _ _ _ _
FINISHED

Thank you! John C Moorfield

Appendix 2: Provisional Results

		Count	N=%
Source (n=5,391)	Te Reo Māori app survey	3,367	62.5%
	Te Aka survey	2,024	37.5%
Which ethnic group do you belong to? (n=5,009)	Māori	2,871	57.7%
	New Zealand European/Pākehā	1,746	35.1%
	Other	392	7.2%
Which country were you born in? (n=4,911)	Other	554	11.3%
	Australia	236	4.8%
	New Zealand	4,121	83.9%
Age group (n=4,054)	7-19	636	15.7%
	20-29	692	17.1%
	30-39	838	20.7%
	40-49	855	21.1%
	50-59	684	16.9%
	60-69	273	6.7%
	70-79	69	1.7%
	80+	7	0.2%

		Count	N=%
In which language[s] could you hold a conversation about a lot of everyday things? (n=5,409)	Other	29	0.6%
	Māori	1,592	4.0%
	English	3,788	95.4%

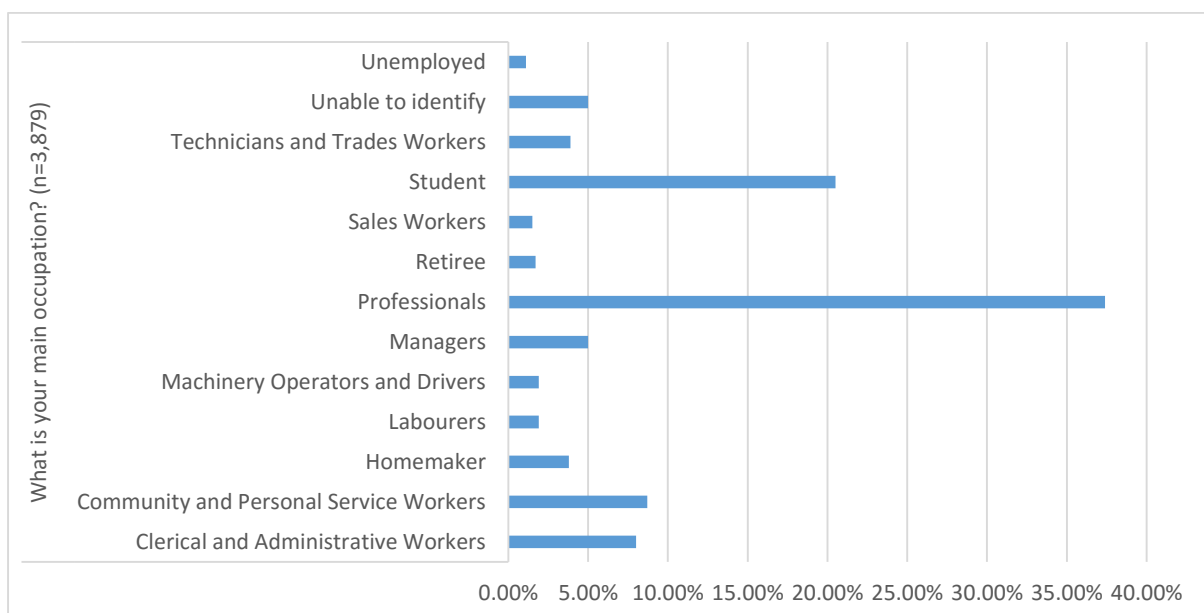|		Count	N=%
What is your highest qualification? (n=4,045)	Level 1 Certificate	690	17.1%
	Level 2 Certificate	65	1.6%
	Level 3 Certificate	220	5.4%
	Level 4 Certificate	62	1.5%
	Level 5 Diploma	197	4.9%
	Level 6 Diploma	56	1.4%
	Bachelor Degree & Level 7 Qualification	1,468	36.3%
	Masters Degree	238	5.9%
	Doctorate Degree	69	1.7%
	No Qualification	339	8.4%
	Overseas Secondary School Qualification	5	0.1%
	Postgraduate & Honours Degrees	197	4.9%
	Postgraduate Diploma/Certificate, Bachelor Honours	9	0.2%
	Trade Certificate	163	4%
	Unable to identify	267	6.6%
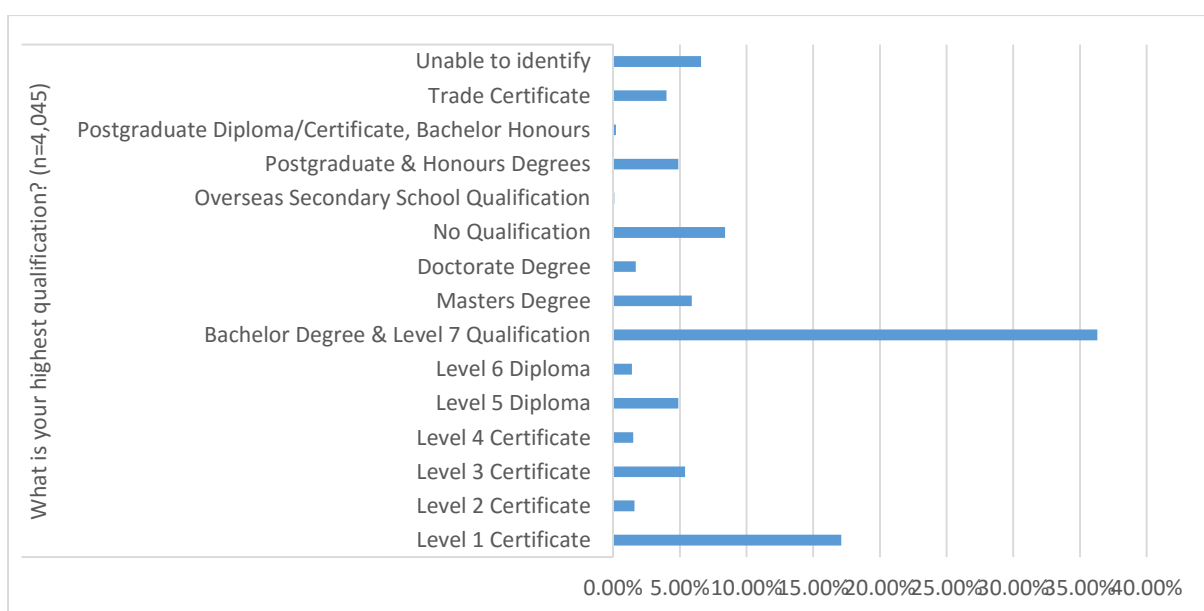
		Count	N=%
What is your main occupation? (n=3,879)	Clerical and Administrative Workers	310	8.0%
	Community and Personal Service Workers	338	8.7%
	Homemaker	147	3.8%
	Labourers	73	1.9%
	Machinery Operators and Drivers	58	1.9%
	Managers	194	5.0%
	Professionals	1,450	37.4%
	Retiree	66	1.7%
	Sales Workers	58	1.5%
	Student	796	20.5%
	Technicians and Trades Workers	152	3.9%
	Unable to identify	193	5.0%
	Unemployed	44	1.1%

		Count	N=%
Rate your ability in the Māori language.(n=3,961)	No ability	311	7.9%
	Beginner	1,791	45.2%
	Intermediate	1,292	32.6%
	Advanced	388	9.8%
	Native Speaker	179	4.5%

Rate your ability in the Māori language.(n=3,961)
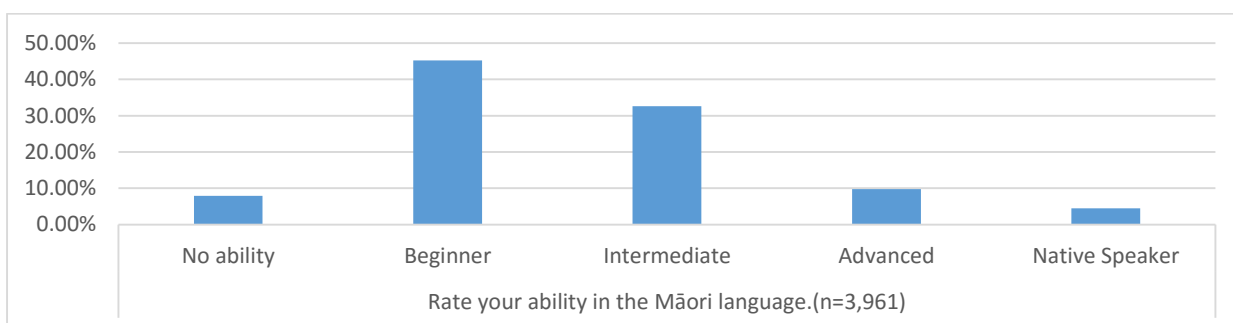
		Count	N=%
How well are you able to speak Māori in everyday conversation? (n=3,762)	Very well (I can talk about almost anything in Māori)	484	12.9%
	Well (I can talk about many things in Māori)	460	12.2%
	Fairly well (I can talk about some things in Māori)	913	24.3%
	Not very well (I can only talk about simple/basic things in Māori)	1,072	28.5%
	No more than a few words or phrases.	833	22.1%

How well are you able to speak Māori in everyday conversation? (n=3,762)
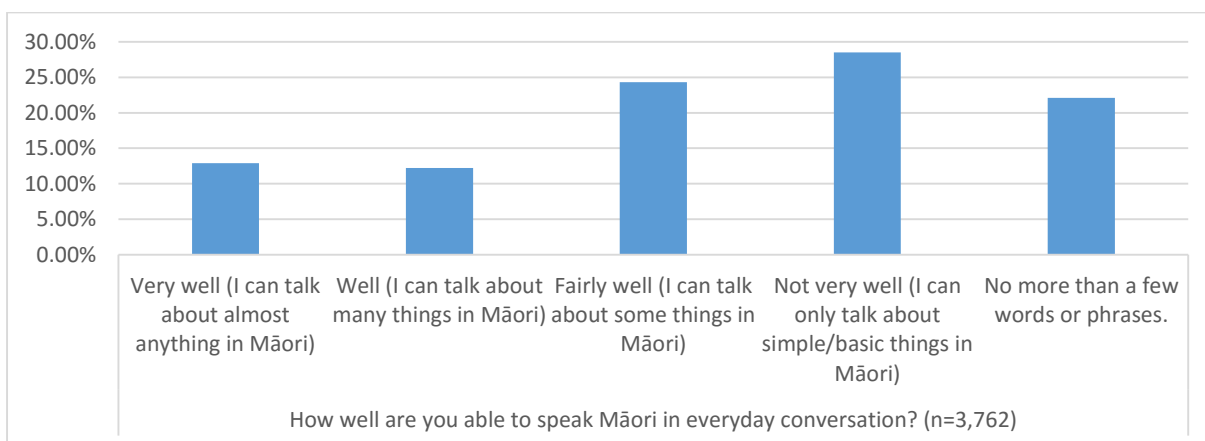
		Count	N=%
How well are you able to understand spoken Māori? (n=3,675)	Very well (I can understand about almost anything in Māori)	549	14.9%
	Well (I can understand about many things in Māori)	707	19.2%
	Fairly well (I can understand about some things in Māori)	902	24.5%
	Not very well (I can only understand about simple/basic things in Māori)	774	21.1%
	No more than a few words or phrases.	743	20.2%
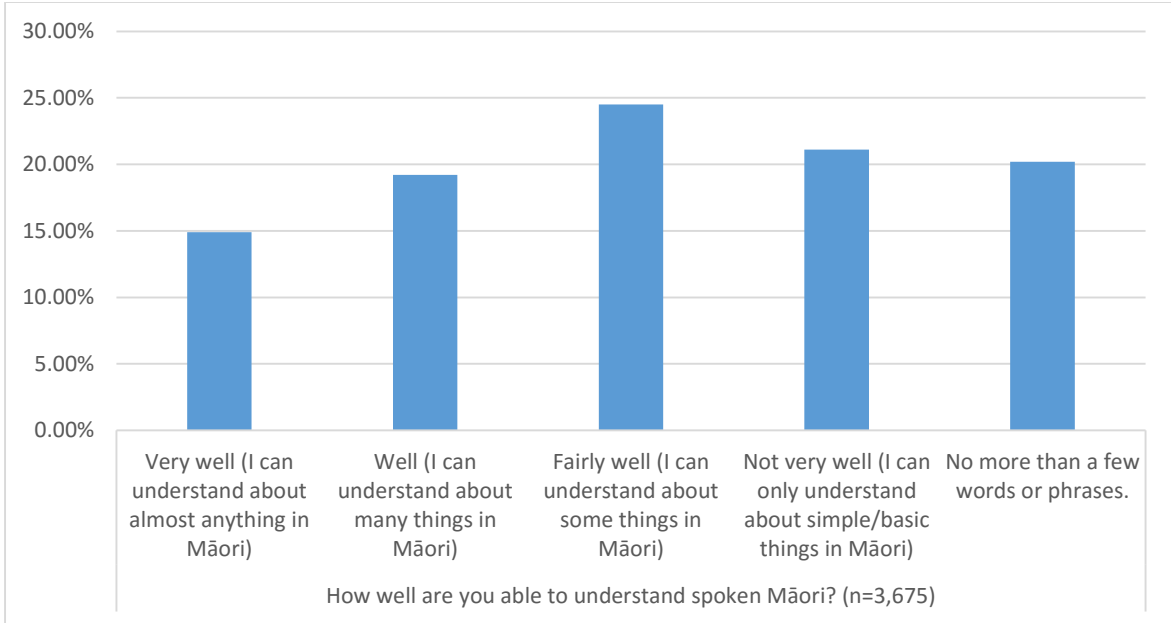
		Count	N=%
How well are you able to read Māori with understanding? (n=3,622)	Very well (I can read about almost anything in Māori)	556	15.4%
	Well (I can read about many things in Māori)	657	18.1%
	Fairly well (I can read about some things in Māori)	982	27.1%
	Not very well (I can only read about simple/basic things in Māori)	736	20.3%
	No more than a few words or phrases.	691	19.1%
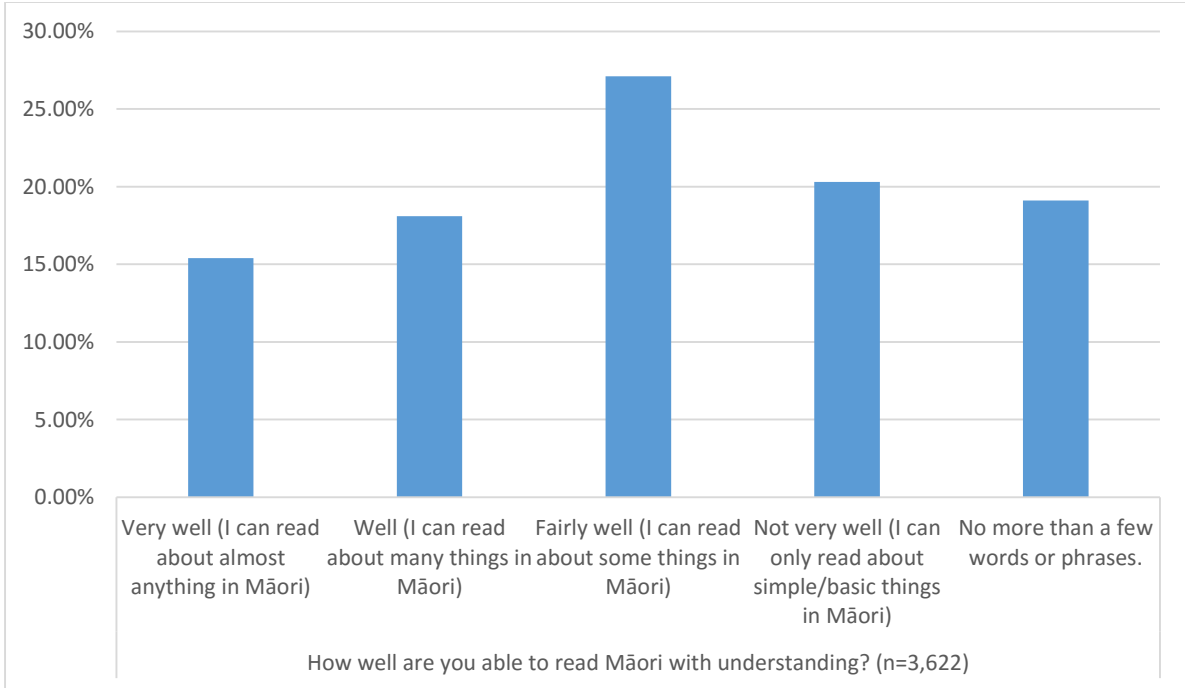
		Count	N=%
How well are you able to write in Māori with understanding? (n=3,570)	Very well (I can write about almost anything in Māori)	443	12.4%
	Well (I can write about many things in Māori)	546	15.3%
	Fairly well (I can write about some things in Māori)	894	25.0%
	Not very well (I can only write about simple/basic things in Māori)	927	26.0%
	No more than a few words or phrases.	760	21.3%

How well are you able to write in Māori with understanding? (n=3,570)
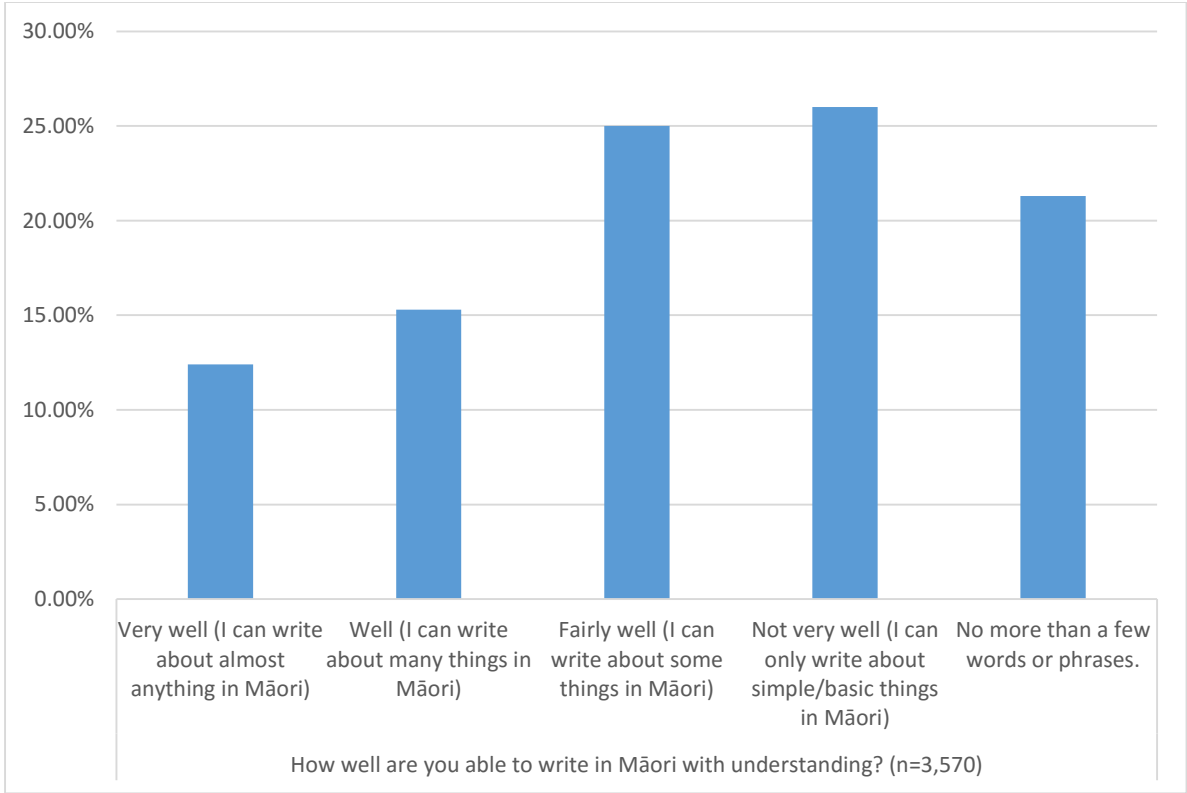
|		Count	N=%
How do you feel about the Māori language being compulsory in New Zealand primary schools? (n=3,548)	Strongly Disagree	261	7.4%
	Disagree	85	2.4%
	Neutral	290	8.2%
	Agree	855	24.1%
	Strongly Agree	2,057	58.0%
Do you think the Māori language is an important part of New Zealand's national identity? (n=3,525)	Strongly Disagree	125	3.5%
	Disagree	21	0.6%
	Neutral	94	2.7%
	Agree	494	14.0%
	Strongly Agree	2,791	79.2%

How do you feel about the Māori language being compulsory in New Zealand primary schools? (n=3,548)

■ Strongly Disagree ■ Disagree ■ Neutral ■ Agree ■ Strongly Agree

Do you think the Māori language is an important part of New Zealand's national identity? (n=3,525)

■ Strongly Disagree ■ Disagree ■ Neutral ■ Agree ■ Strongly Agree
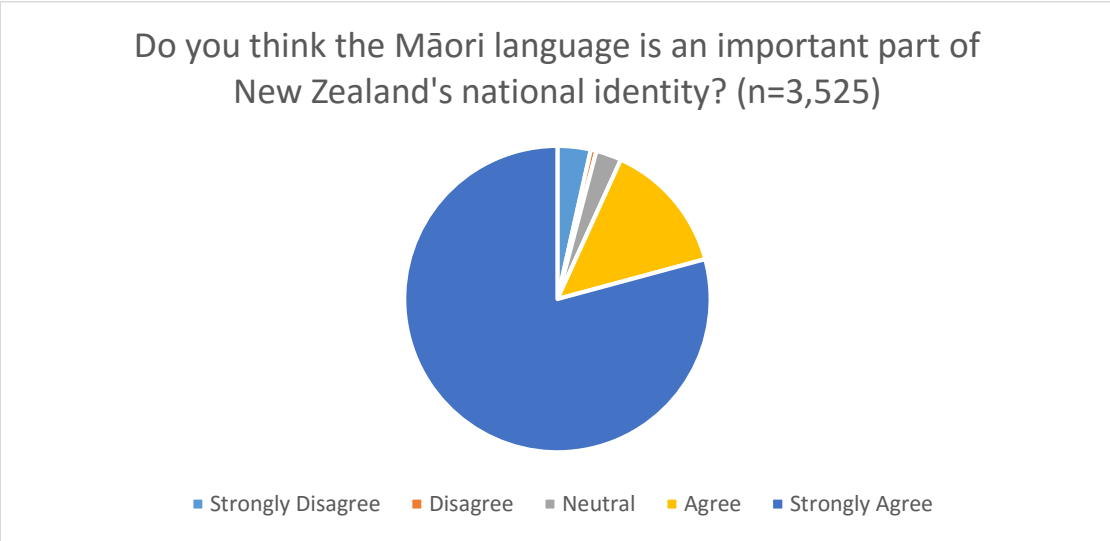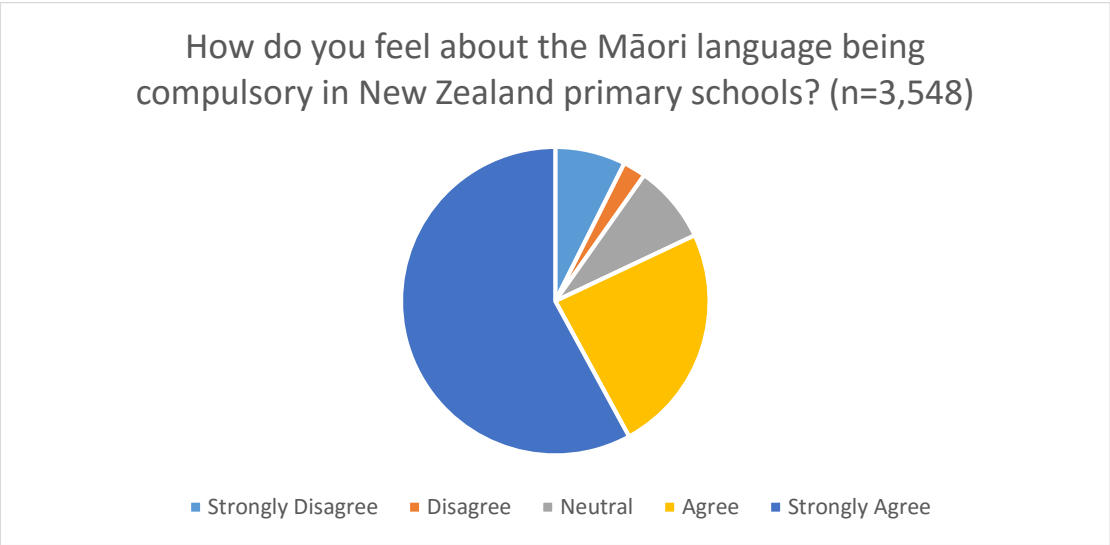
		Count	N=%
Do you use Te Whanake hard copy resources? (n=5,391)		1,926	35.7%
	No	2,003	37.2%
	Yes	1,462	27.1%
Do you use Te Whanake digital resources? (n=5,391)		1,978	36.7%
	No	1,981	36.7%
	Yes	1,432	26.6%

Case Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
For what purpose are you using Te Aka and/or the Te Reo Māori app?	5,391	100.0%	0	0.0%	5,391	100.0%
How is Te Aka and/or the Te Reo Māori app helping you to learn the Māori language?	3,511	65.1%	1,880	34.9%	5,391	100.0%
Why do you choose to use Te Aka and/or the Te Reo Māori app?	3,274	60.7%	2,117	39.3%	5,391	100.0%

Frequencies				
		Responses		Percent of Cases
		N	Percent	
For what purpose are you using Te Aka and/or the Te Reo Māori app?	to find the meaning of a word or a Māori/English equivalent of a word	4,566	32.6%	84.7%
	to find how to use a word in a sentence	2,620	18.7%	48.6%
	research	1,647	11.8%	30.6%
	homework	1,553	11.1%	28.8%
	to find where to place the macrons	1,714	12.2%	31.8%
	general interest	1,607	11.5%	29.8%
	other	297	2.1%	5.5%
Total		14,004	100.0%	259.8%

For what purpose are you using Te Aka and/or the Te Reo Māori app?
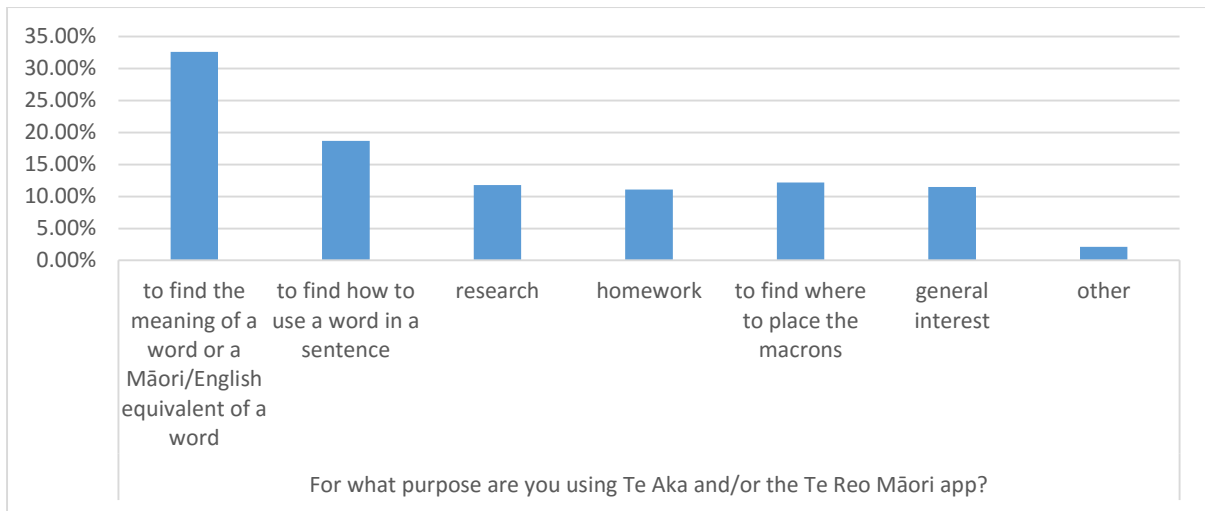
Frequencies				
		Responses		Percent of Cases
		N	Percent	
How is Te Aka and/or the Te Reo Māori app helping you to learn the Māori language?	Grammar	1,950	16.9%	55.5%
	Vocabulary	2,647	23.0%	75.4%
	Speaking	1,621	14.1%	46.2%
	Writing	1,970	17.1%	56.1%
	Reading	1,629	14.1%	46.4%
	Understanding	1,659	14.4%	47.3%
	Other	57	0.5%	1.6%
Total		11,533	100.0%	328.5%

How is Te Aka and/or the Te Reo Māori app helping you to learn the Māori language?
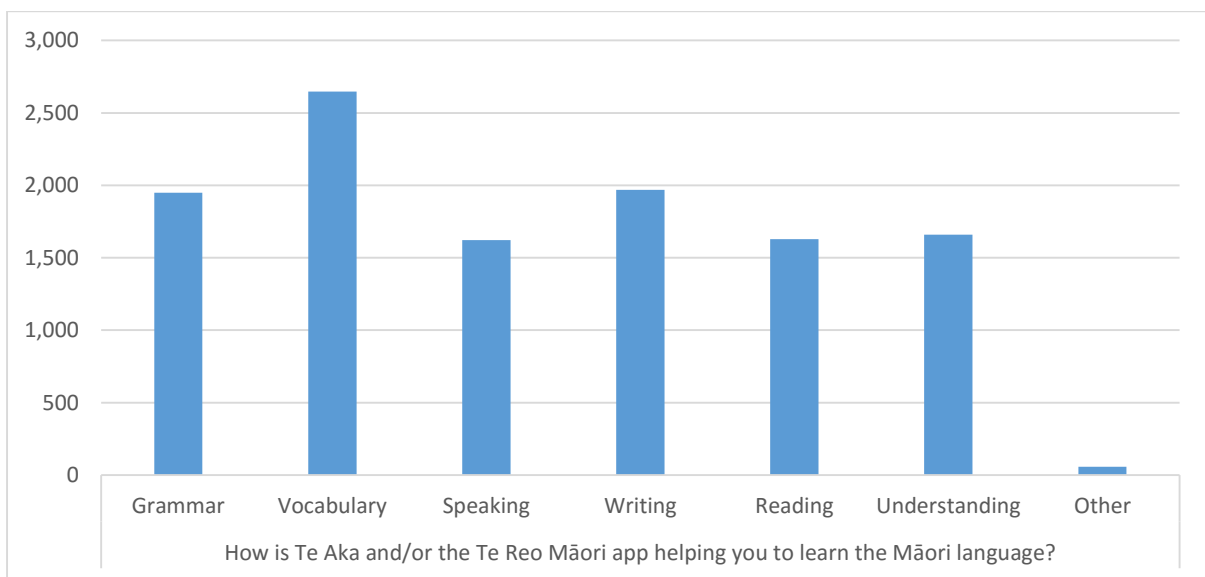
Frequencies				
		Responses		Percent of Cases
		N	Percent	
Why do you choose to use Te Aka and/or the Te Reo Māori app?	Easy access	2,637	26.3%	80.5%
	Current	1,381	13.8%	42.2%
	Inclusion of digital assets e.g. images and audio	641	6.4%	19.6%
	Mobility and convenience	1,639	16.3%	50.1%
	Reliable information	1,518	15.1%	46.4%
	Accurate information on key Māori concepts	794	7.9%	24.3%
	Dictionary usually provides a search result	1,238	12.3%	37.8%
	Other	177	1.8%	5.4%
Total		10,025	100.0%	306.2%