Localization Provision in New Zealand: Arabic speakers' Preference for Different Paralingual Webpage Layouts

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Abstract

This research is designed to test Arabic speakers' preference for different paralingual webpage layouts to assist newcomers to New Zealand such as international students, refugees and immigrants who have inadequate English language proficiency to access vital information available on governmental websites. Paralingual is coined from the prefix 'Para' (which means side by side or together in Greek), and 'lingual' meaning language such as in bilingual (grasp of two languages).

Mixed and triangulation methods were used to collect data consisting of an online websurvey; an eye tracking experiment; and participants' interviews. The results show:

a) That the mainstreams of Arabic speakers prefer English text on the left and the Arabic translation on the right as a paralingual webpage layout;

b) That inadequate English language proficiency discourages Arabic speaking newcomers from accessing governmental websites;

c) That paralingual web design could be used as an educational tool;

d) That paralingual web design is easier to read; and

e) That paralingual web design increases trust in the government.

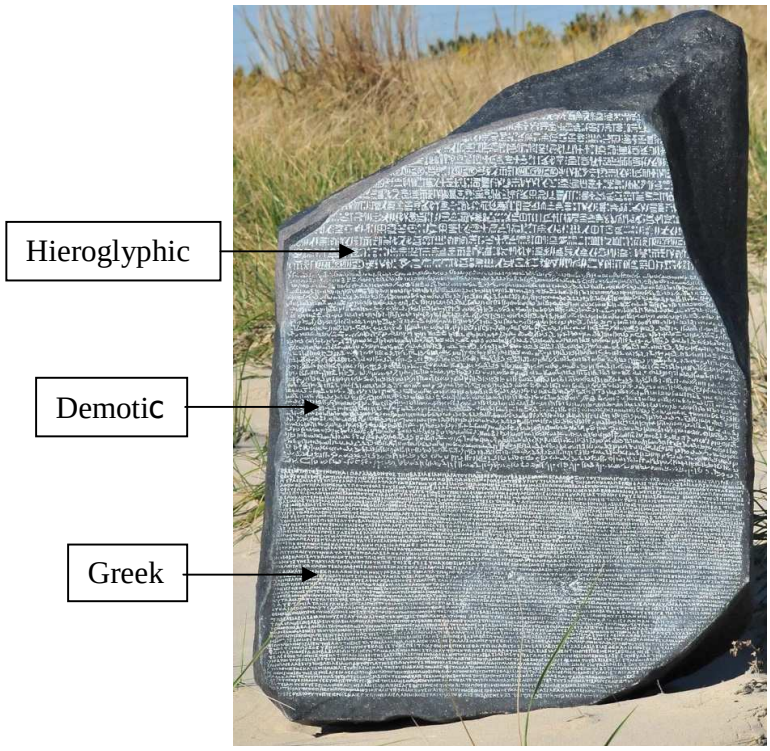
There have been limitations such as the participation of refugees and immigrants in the eye tracking experiment and the participants' interviews. There have been recommendations such as the use of paralingual web design in governmental websites for maternity and medical health.

Preface

It is important to acknowledge and make clear that the term paralingual comes up on the Internet search engines as a medical term used to identify places in the mouth under the tongue (Inkling, 2013).

However, paralingual communication also appeared as: *"The way your words sound despite their actual meaning. Examples include accent, time of voice, speed of speech, personal space used between two communicating parties. It's the verbal communication outside of just words. It's reading in-between the lines"* (Wiki Answers, 2013).

Nonetheless, paralingual design was used in 196 B.C., the example of that is the 'Rashid' or 'Rosetta' stone that was discovered in Egypt, as further discussed in Section 8.2.2. The Rosetta stone is a stone with writing on it in two languages (Egyptian and Greek), using three scripts (hieroglyphic, demotic and Greek). The stone was found in 1799 by the French. Jean-François Champollion deciphered the hieroglyphs in 1822. Champollion could read both Greek and Coptic (British Museum, 1999). It seems that Champollion used paralingual as an educational tool.



Acknowledgement

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Finally, I dedicate this project to my deceased parents that would have made them very proud.

Disclaimer

In submitting this thesis, I confirm that except where appropriate attributions are made, the thoughts, words and arguments it contains are entirely my own work.

I hereby confirm that this is my work; the materials included in this thesis were cited and referenced according to APA referencing guidelines.

Fouad K. Shiblaq

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Chapter One: Introduction

1.1. The Importance of this Research in Adding to Knowledge

The aim of this research is to investigate Arabic speakers' preference on paralingual webpage layouts in Arabic and English languages. There has not been an attempt in New Zealand to identify such a preference to assist website developers using such findings in their governmental website design to enable refugees, immigrants and potential overseas investors to browse New Zealand governmental websites with ease by using paralingual web design.

In 2003 and 2005 two summits were held in Geneva and Tunisia respectively, the aim of which was to encourage the use of Information and Communication Technology (ICT) and thus reduce the digital divide between nations around the world. A following World Summit on the Information Society (WSIS) will be held in 2015 to evaluate and assess the progress of the previous two summits. Therefore, this would be an opportunity to present this research as a step in the right direction on the part of the New Zealand Government's contribution.

A scholar called Michael Gurstein created the Community Informatics (CI) theory that he defined as:

- Methodology of community development by using ICT to enable communication;
- ICT tools that are available to local communities;
- Incorporating ICT for economic and social development; and
- New approaches to Information Systems (Gurstein, 2007).

Therefore, this research is an example of CI in society, because it contains an application of ICT and Human Computer Interaction (HCI), by involving and including members in the communities such as the participants as one of the stakeholders of this research other stakeholders are the government, e-government website developers, educational institutions, and Governmental and Non-Governmental Organisations (NGOs).

1.1.1. The Gap in the Literature

There have been only a few on Information and Communication Technology (ICT) that were concerned with minorities in the society such as refugees and immigrants who came from different countries to make New Zealand their homeland. The literature has been unable to deal with the core issues and create solutions. There has however been one qualitative study that was conducted on refugees and immigrants residents in New Zealand aiming to investigate new immigrants' perception on ICT, and the reasons behind not adopting ICT (Turner, Sambaino, & El Sahn, 2007).

Kabbar and Crump (2007) were able to identify that the English language was one of the reasons for refugees not adopting ICT in their daily activities, and the recommendation was to create a short publication in the refugees' native languages about useful URLs that will be still displayed on their PC in English. The report failed to distinguish on the one hand between immigrants who choose to come to New Zealand with a good education, emotionally prepared to relocate, and having good economic status; and refugees who were on the other hand were relocated due to unstable circumstances in their own countries, have little or no education and who are very poor.

1.2. Research Significance to the Researcher

As an Arabic native speaker, this researcher considers this research to be important not just to the researcher but to the whole Arabic Speakers community, because it would enable refugees and immigrants to look for information online by themselves, and alleviate the responsibilities of organizations offering aid to migrants.

1.3. Chapter Contents

Chapter 1 introduces the themes of the research. It explains why the research is important, and why it is important to the researcher. It defines some important concepts, lists what is covered in each chapter and the research questions to be investigated.

Chapter 2 is the literature review; and chapter 3 explains the methodology.

Chapter 4 contains details of the online survey; Chapter 5 describes the usability study implementing the eye tracking technique; Chapter 6 will describes the interviews that are to be performed following the eye tracking experiment; Chapter 7 is the data analysis chapter; Chapter 8 is the discussion and findings chapter; and Chapter 9 is the recommendation and conclusion chapter.

1.4. Migrants consist of Immigrants and Refugees

The common definition for migrants is people moving to different countries; the main two types of migrants are immigrants and refugees including asylum seekers. The public sometimes use the word migrants to specify immigrants only, but in this research the word migrants is used to indicate both immigrants and refugees.

In spite of the similarities between these two migrant groups, they remain distinctive. A refugee according to the United Nations High Commission for Refugees is:

> *Any person who owing to a well-founded fear of being persecuted for reason of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his/her nationality and is unable or, owing to such fear, is unwilling to avail himself/herself of the protection of that country* (Guerin, Diiriye, Corrigan, & Guerin, 2003, p. 84).

The main countries of refugees' intake are: USA allowed 41,300; Australia allowed 13,400; Canada allowed 10,700; Sweden allowed 2,400; Norway allowed 1,000; and New Zealand allowed 750. These numbers of refugees' intake are specified according to each country's population (United Nations High Commissioner for Refugees (UNHCR), 2007).

Arab and Muslim refugees accepted for New Zealand's UN quota between 1980 and 2008 were 2,605 from Iraq; 1,743 from Somalia; 336 from Sudan; 60 from Palestine; 51 from Syria; 20 from Kuwait; 9 from Saudi Arabia; 9 from Tunisia; 8 from Libya; and 8 from Yemen (RefNZ Statistics, 2010).

On the other hand, most immigrants have come to the country by applying for the skilled migrant category through Immigration New Zealand. If an immigrant has the

skills needed in New Zealand then he/she would have the opportunity to work and live in New Zealand. Most immigrants are educated; well off; they have willingly chosen to migrate to New Zealand; and a lot of immigrants find jobs with no difficulties (Immigration New Zealand, 210). Immigrants have adequate education money, and arrive legally with their family members (Te Ara Encyclopaedia of New Zealand, 2009).

1.5. Paralingual Designs

Some developing countries use e-government to provide basic information about governmental organizations and issues related to their residents, other developed countries such as New Zealand use e-government to provide services online such as registering vehicles; applying for employment; applying for permits; paying fines; and providing e-consultation on matters of public interest (Segovia, Jennex, & Beatty, 2009).

This is a very good medium for governments to enhance communication between them and their citizens as well as businesses.

The significance of publicizing e-government among immigrants would encourages involvements in democratic practices and empowers them to become productive effective, and financially independent.

The inclusion of new migrants within society using ICT requires innovations in website designs. Paralingual is a web design methodology that may allow for presentation of the information in a multilingual layout side by side on the same webpage.

The use of paralingual web design's link for example on an e-government's website homepage, using the Arabic language accompanied by the English language would help in winning Arabic speakers' trust and participation.

This initiative would anticipate in reducing the digital divide among Arabic speakers in addition to other initiatives such as enhancing IT skills and providing ICT equipment to migrants through arranging for computers through the Computers in Homes scheme (Computers in Homes, 2010).

> *Paralingual is a web design methodology for presenting information in more than one language. Paralingual web design involves placing content in the desired languages but instead of having separate pages for each language as is common in a bi or multilingual web design, the bi or multilingual content is placed side by side on the same page* (Segovia, et al., 2009, p. 37).

Segovia et al. (2009) introduced in their article paralingual web design methodology in the USA to test if it improves system acceptance and success. The concern was that there may be a trust issue preventing access to e-government, where success is measured by the number of uses of an e-government's website.

Websites that are multilingual are targeted to monolingual users who are interested in reading information in their native language. The link that is created is designed to present materials in users' native language in a way that suits users' tasks. Therefore designers should be susceptible to cultural issues such as icons, graphics, and colours; thus information architecture has an impact on designing these sites (Cunliffe, Jones, Jarvis, Huws, & Munro, 2002).

1.6. The Dynamic Social Theory and Relative Refugees' Indicators

The theory of society and the dynamic social theory assemble society as interconnected subsystems (Fuchs, 2008). That helps us to understand and analyse issues related to refugees and immigrants within society, a theory that symbolizes how ecological, technological, economic, political and cultural structures complement each other.

Similarly, Gray and Elliot (2001) described only four spheres of how settlement and integration are multi-dimensional concepts for migrants, and how variation of integration exists from one sphere to another; therefore the outcomes in one sphere affect the outcomes in another as shown in Table 1.

Table 1 Economic, social, cultural, and political spheres and their indicators

Dimension	Short-term Settlement	Longer term integration
Economic	* Entering job market * Financial independence	* Career advancement * Income parity * Entry into field of prior

		employment
Social	* Established social network * Diversity within social network	* Accessing institutions * Engaging in efforts to change institutions
Cultural	Adaptation of various aspects of lifestyle (e.g. diet, family relationships)	* Engaging in efforts to redefine cultural identity * Adapting or reassessing values
Political	* Citizenship * Voting	* Participation in political parties * Participation in socio-political movements

(Gray & Elliott, 2001, p. 73)

These dimensions will be discussed in depth in Chapter 8 'Discussion and Findings' in this research thesis.

1.7. Research Questions

This research will contribute to our knowledge by classifying the preference of Arabic speakers on paralingual webpage layout; consequently, this research's framework can be applicable to any particular ethnic group in order to specify their preference on paralingual webpage layout in their own language.

Thus, the aim of this research is to answer the following research questions:

Q1. What obstacles prevent Arabic speaking migrants from being online and having access to e-government in NZ?

Q2. What paralingual layout do the majority of Arabic speaking migrants prefer when browsing e-government in NZ?

Q3. What are the benefits of a paralingual e-government website in NZ for Arabic speakers?

The secondary data will help to give answers to Q 1 and Q 3 from the relevant literature. On the other hand, the primary data will be sourced from three areas: an extensive online survey, a usability study including an eye tracking experiment and participant interviews following the eye tracking experiment that will give answers to Q 2 as well as the other two questions.

1.8. Literature Map

Table 2 lists all the literature sources used in the literature review chapter.

Table 2 Literature Map

Themes	References	No
2.2 Arabic Speakers Characteristics		
2.2 Arabic Speakers' Characteristics	(Kadri, 2009) (Warraq, 2007) (Internet World Stats, 2009)	1 2 3
2.2.1 The Arabic Language Characteristics	(Ghosh, Dube, & Shivaprasad, 2009) (Kadri, 2009)	4 5 6
2.2.1.1 The Progression of the Arabic Language and the Utilization of Modern Standard Arabic (MSA)	(Abdelali, 2004)	7
2.2.2 The Cultural Characteristics	(G. H Hofstede, 2001) (Hashim, Murphy, & Hashim, 2007) (Callahan, 2006)	8 9 10
2.2.2.1 Hofstede Five Dimensions of Culture Research Model	(Khashman & Large, 2010)	11
2.2.2.1.1 Conflicting views on Hofstede's Model	(Khashman & Large, 2010) (Barber & Badre, 1998) (Kadri, 2009) (Al-Badi, 2009) (Hemayssi, Moll, Sanches, & Field, 2005) (Abdul Rahim, Mohd Isa, Noor, & Mehad, 2007) (Webmonkey, 2010, p. 1) (Fraternali & Tisi, 2008) (Mushtaha & De Troyer, 2009)	12 13 14 15 16 17 18 19 20 21
2.3 The Digital Divide		
2.3.1 History	(National Telecommunications and Information Administration (NTIA), 1999) (Organisation for Economic Co-operation and Development (OECD), 2001)	22 23

2.3.2 The World Summit on the Information Society (WSIS)	(Byrne, 2004 a) (International Telecommunication Union, 2007) (Byrne, 2004 b) (Taylor, Schauder, & Johanson, 2005) (Cammaerts & Carpentier, 2006) (Ministry of Justice, 2007)	24 25 26 27 28 29
2.3.3 The language divide, Information Poverty, and Tools to Measure them		
2.3.3.1 The Language Divide	(May, 2005) (The Office of Ethnic Affairs, 2005) (Change Makers Refugee Forum, 2008) (Ranford, 1999) (Rangahau, 2009) (Matamoros, 2009) (Chile, 2006) (Butcher, Spoonley, & Trlin, 2006) (Abbott, 1997) (Ishida, 2007) (Abd Rozan et al., 2005 , p. 5)	30 31 32 33 34 35 36 37 38 39 40
2.3.3.2. Information Poverty	(Britz, 2007)	41
2.3.3.3. Tools for measuring the digital divide	(Dewan & Riggins, 2005) (Kouadio, 2008) (International Telecommunication Union, 2006)	42 43 44
2.3.4 The Migrants' digital divide in New Zealand and the initiatives to reduce it	(Kabbar & Crump, 2007)	45
2.3.4.1 Migrants Circumstances in New Zealand	(Kadri, 2009) (Campbell, 2002) (The Office of Ethnic Affairs, 2005) (Ministry of Social Development, 2008)	46 47 48 49
2.3.4.2 Waikato and Hamilton City Ethnicities	(Mhlanga, 2008)	50
2.3.4.3 The Adoption of ICT Among Migrants in New Zealand	(Campbell, 2002)	51
2.3.4.3.1 Use of ICT Among Migrants Prior to Coming to New Zealand	(Campbell, 2002)	52

(GUI)	(Jacko & Sears, 2003)	80
2.6.1 History	(Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI), 2008)	81
2.6.1.1 HCI as an Interdisciplinary Design Science	(Shneiderman & Plaisant, 2005)	82
2.6.2 Different Types of User Interface	(El-Bakry, et al., 2010)	83
2.7.2 Use of Entities	(Nelson, 2009)	84
2.7.4 Font Size	(Nichols, Witten, & Keegan, 2005)	85
2.8 Eye Tracking Technique	(COGAIN, 2009) (Suler, 2000) (Ehmke & Wilson, 2007) (Pernice & Nielsen, 2009)	86 87 88 89

Appendix A shows lists of significant literature resources that have been organized into related literature Sections and subsections.

1.9. Chapter One Summary

Section 1.1 contains information about the importance of this research.

Section 1.2 contains a discussion of the research significance to the researcher.

Section 1.3 consists of the research chapters' headings.

Section 1.4 contains a discussion of defining the term migrants.

Section 1.5 provides a definition of paralingual design.

Section 1.6 contains a discussion of the dynamic social theory and relative refugee indicators.

Section 1.7 contains the research questions.

Section .1.8 consists of a literature map covering literature articles of Chapter 2.

1.10. Next Chapter

Chapter 2 is the literature review chapter; this chapter consists of the body the literature that forms the research paradigm for this research. Starting with Arabic speakers' characteristics, and then: a definition and a discussion of the digital divide; a definition and a discussion of globalization, internationalisation, and localization; a discussion of constructing a website in another language; a discussion of the HCI; a

discussion of the tools and techniques used in constructing a website; and the eye tracking experiment techniques and processes.

Chapter Two

2.1. Introduction

The literature review sets the scene and places the research in context of other work that already been undertaken. This chapter is organized into Sections and sub-Sections that discuss interrelated issues to assist answering the research questions by reviewing the literature as being a secondary data collection.

This literature review highlights issues that are relative to localization provision in order to discover Arabic speakers' preference on paralingual webpage layouts by concentrating on Arabic refugees and immigrants living in New Zealand as well as overseas. Therefore the literature review's chapter draws its content from the following bodies of literature that are all interrelated and form the main core for this research: Arabic Speakers characterization; the digital divide; Human Computer Interaction (HCI) and Web User Interface (WUI); Globalization (G11N); Internationalization (I18N); Localization (L10N); and eye tracking techniques.

This literature review assists in providing some responses to the first and third research questions.

Q1. What are the obstacles behind preventing Arabic speaking migrants from being online and having access to e-government in NZ?

Q3. What are the benefits of a paralingual e-government website in NZ for Arabic speakers?

The first Section, 2.2, discusses Arabic speakers' characteristics both the language and the cultural characteristics in order to identify major issues for Arabic speakers that prevent them being online.

The second Section, 2.3, discusses aspects of these digital divides including information literacy, as well as the language divide, and how they are affecting new migrants.

Section 2.4 defines and discusses localization, internationalization and globalization to explain the incentives and the benefits of using localization and how it differs from internationalization.

Section 2.5 discusses building websites in another language and serves as a guideline to building a paralingual website. (The information obtained from Section s 2.5 to 2.8 will be applied in Chapter 5 the usability study.)

Section 2.6 discusses HCI to recognize and identify the classification of this research, and provide understanding of how to implement some commonly used HCI techniques.

Section 2.7 discusses tools and techniques such as HTML, XML, and CSS that would assist in the understanding of implementing more than one language on one website.

Section 2.8 discusses eye tracking techniques and gives some examples of experimentation using this technique.

Section 2.9 summarizes the various Section s of the literature review chapter and applies the discussion to the research questions.

2.2. Arabic Speakers' Characteristics

Arabic Speaking migrants are characterized by two main characteristics: first the Arabic language itself, which is spoken by more than 344,139,242 people around the world, and more than 60 million of whom are Internet users (Internet World Stats, 2009).

The second characteristic is cultural: for example, more than 95% of Arabic speakers are Muslims (Warraq, 2007). It means that they have special reservations on dressing, drinking and eating.

Muslim women, for example, are used to wearing a veil to cover their hair in their home countries; Muslims are not allowed to drink alcohol; Muslims are encouraged to eat Halal meat, and they are not allowed to eat pork; and Muslims are not allowed to accept loans or work in liquor stores or gamble (Kadri, 2009).

2.2.1. Arabic Language Characteristics

The Arabic language's structure differs enormously from English language, such that puts Arabic speakers under stress to learn the new language, because the two languages use different alphabets, and different grammar structure.

Kadri (2009) has discussed Arabic speakers' characteristics, their status, and their living conditions in New Zealand as their second home country. these will be covered in the following sub-Section s.

"The Arabic language became the fourth official language in the UN in 1972" (Kadri, 2009, p. 59), which means that there are a vast number of Arabic speakers around the world.

According to Ghosh, Dube and Shivaprasad (2009), there are six major writing systems as shown in Figure 1. From left to right, they are Logographic, Syllabic, Abjad, Abugida, True Alphabetic and Featural. From left to right, the tree diagram shows the originals of each of the widespread languages used around the world: Chinese, Japanese, Hebrew, Arabic, Latin, Cyrillic and Korean.

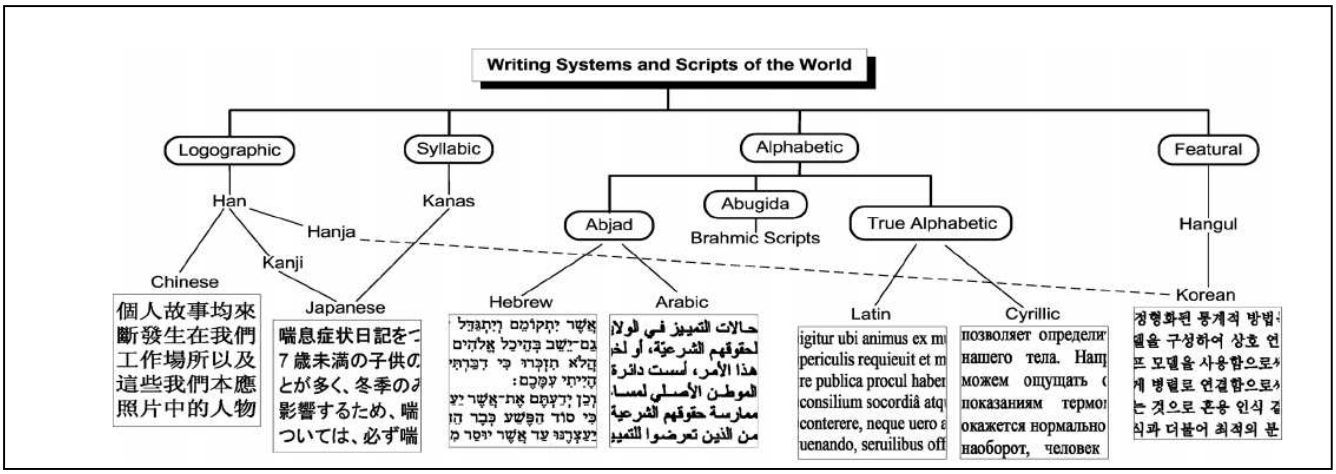


Figure 1 Classification of prominent writing systems and scripts of the present world (Ghosh, et al., 2009, p. 3)

As shown in Figure 1, the classification of the Arabic language is Abjad, the same as Hebrew, and both have their origin in the Alphabetic system. What distinguishes Abjads from other scripts is that they are written from right to left.

A typical Arabic character is formed of a long main stroke along with one to three dots. The

> *characters in a word are generally conjoined giving an overall cursive appearance to the written text. This provides an important clue for the recognition of Arabic script. The same applies to some other scripts of Arabic origin such as Farsi (Persian), Urdu, Sindhi, Jawi, etc. On the other hand, character strokes in Hebrew are more uniform in length and the letters in a word are generally discrete* (Ghosh, et al., 2009, p. 3).

Because Abjads' origin is alphabetic, Arabic speakers tend to match Arabic alphabets to English alphabets that have similar sounds in both languages.

For pronouncing and writing English words, for example the letters (A = أ), (B = ب), (J/G = ج), (D = د), (H = ح/ه), (W = و), (Z = ز), (K = ك), (S = س), (SH = ش), (KH = خ), (M = م) etc. For example, Mark = مارك, consists of these letters (M = مـ, A = ا, R = ر, K = ك), and Te Taka = تاكا تي, consists of these letters (T = ت, E = ي, T = ت, A = ا, K = ك, A = ا).

2.2.1.1. The Progression of the Arabic Language and the utilization of Modern Standard Arabic (MAS)

Abdelali (2004) has classified the Arabic language into three categories:

1. *Classical written Arabic: is defined as the Arabic used in the Holy Quran and in the earliest literature, and forms the core of much literature to the present day;*
2. *Modern Standard Arabic (Fus'ha): is a modernization of the structure of classical Arabic, and includes words for modern phenomenon, as well as additions from the many dialects used all over the Arabic world; and*
3. *Spoken Arabic: is a mixed form, with many variations, and often with a dominating influence from local languages (Prior to the introduction of Arabic) or from colonial languages* (Abdelali, 2004, p. 23).

These language types show how complex this language is, and how complex it would be to use classical Arabic, which may cause embarrassment if used inappropriately. Therefore, it is important that a native speaker should conduct this type of research. On the other hand, the Modern Standard Arabic (MSA), also known as Fus'ha in, is the official written and spoken language of all Arabic speakers.

> *MSA is the form of Arabic universally taught in schools of the Arab world. In addition, books,*

> *newspapers, journals, reports, and most other printed material are printed in Modern Standard Arabic. Educated speakers also use it in formal discussions or giving oral presentations. News on radio and TV, speeches by presidents and ministers, and discussions by intellectuals are conducted in Modern Standard Arabic* (Abdelali, 2004, p. 23).

This Fus'ha is the language that will be used on the paralingual webpage, because all Arabic speakers are familiar with this type, and they use it in all their formal writings, novels; and literature; they use it in their speech also.

The third type is Spoken Arabic, which has different dialects used in different Arab countries. For example, the Spoken Arabic in Morocco is very different from the Spoken Arabic in Saudi Arabia, and it would be impossible to communicate between the two dialects. However if two people from different countries used Fus'ha, they would understand each other and would be able to communicate well.

2.2.2. Cultural Characteristics

Many scholars have discussed the cultural differences and their effects on localization with regard to website design. All scholars who have analysed Arabic speakers' cultural characteristics have used Hofstede's (2001) model as a reference or basis for their research framework, in order to discover transnational marketing trends.

One main issue that Hofstede did not touch on is the influence of Islam faith on Arabic speakers' daily life. Hashim, Murphy, and Hashim (2007) explain Islam's influence:

> *Islam merges religion and life. Islamic law, also known as Shariah law, provides guidelines for daily life, politics, banking, business, contract law, social issues, and even border disputes. The law draws from two primary sources, the Quran and Hadith (teaching and examples of the Prophet Muhammad), and two secondary sources: Qiyas that extend Shariah law to a new situation by analogy and Ijma, or scholarly consensus to guide Muslim life* (Hashim, et al., 2007, p. 1086).

Differences in design in different cultures have led to different advertising approaches. These approaches revealed important results, for example there were differences in:

> *Advertisement size, use of black and white visuals, frequency of use of photographs, and use of metaphor between US and European countries, other differences were in the frequency of figurative images, comparative images, and appeal (emotional vs. Rational) between Arab countries and United States* (Callahan, 2006, p. 240).

2.2.2.1. Hofstede's Five Dimensions of Culture Research Model

An anthropologist called Geert Hofstede carried out research around the world in 1984 on IBM employees using questionnaire surveys on attitude, which led to theories applied in interface designs (Khashman & Large, 2010). Hofstede's model consists of five dimensions: power distance, individualism/collectivism, uncertainty avoidance, masculinity/femininity, and long/short-term orientation.

> *Power distance describes the distribution of power between members of a culture. Individualism/collectivism ranks cultures based on the individual or collectivistic orientations of their members. Masculinity/Femininity refers to gender roles, not physical characteristics, within cultures. Uncertainty Avoidance describes the extent to which the members of a culture feel threatened by unknown situations. Finally, Long/Short-term Orientation describes future versus historical (past) orientations of the culture* (Khashman & Large, 2010, p. 2).

2.2.2.1.1. Conflicting Views on Hofstede's Model

Other scholars argued that: "*Hofstede's model of culture does not fully reflect the design characteristics of Arabic interfaces"* (Khashman & Large, 2010, p. 1). Khashman and Large (2010) narrated that Hofstede's model was partially confirmed, and there was a suggestion that there is a need to examine more Arabic governmental websites to come up with more accurate and up to-date results.

Cultural makers are elements preferred within a particular cultural group: culturability is a term used to relate culture to usability in websites design; design elements that are suitable for Arabic speakers may not be suitable for speakers of other languages (Barber & Badre, 1998).

Therefore, the Arabic speakers' preferences about paralingual webpage layouts could be regarded as a cultural maker. For example Table 3 shows a colour-culture chart of five different countries - China, Japan, Egypt (Arabic speakers), France and the United States.

Table 3 Colour-Culture Chart for Five different Countries around the World

Colour	China	Japan	Egypt	France	U.S.
Red	Happiness	Anger Danger	Death	Aristocracy	Danger Stop
Blue	Heavens	Villainy	Virtue Faith Truth	Freedom Peace	Masculine
Green	Ming Dynasty Heavens	Future Youth Energy	Fertility Strength	Criminality	Safety Go
Yellow	Birth Wealth Power	Grace Nobility	Happiness Prosperity	Temporary	Cowardice Temporary
White	Death Purity	Death	Joy	Neutrality	Purity

(Barber & Badre, 1998, p. 3)

"Culture, religion, and language are what differentiate every nation; these aspects are vital and important to the identity, self-existence and self-worth of ethnic groups" (Kadri, 2009, p. 49).

Al-Badi (2009) expresses the importance of personal user interface such as colours, graphics, and content to increase users' interest in websites. *"Issues like colours, graphics, signs and placement of web elements may have different connotations for people in different parts of the world. Audiences may differ in age, educational level, or users might be able to use a personal user interface"* (Al-Badi, 2009, p. 1). Hemayssi et al. (2005) discuss how Middle Eastern culture and language is a difficult challenge for non-native speakers who take part in designing websites. *"Distinctive*

issues in Arabic challenge non-speakers of the language. The cultural is tightly woven with the linguistic. Successful design must accommodate the traditions and expectations of Gulf Arabic users and feel right in the context of their tasks and limitations" (Hemayssi, et al., 2005, p. 2).

Another incorporation of Hofstede's model was done in the field of Information Architecture (Abdul Rahim, et al., 2007). *"Information Architecture is the science of figuring out what you want your site to do"* (Webmonkey, 2010, p. 1).

Fraternali and Tisi (2008) have attempted empirical and experimental research to investigate culture markers in usability, *"This research presented a practical definition of culturability, i.e., usability in presence of influential cultural factors, and an effective procedure for identifying and validating cultural markers, defined as Web design patterns affected by cultural context of users"* (Fraternali & Tisi, 2008).

The developments in website designs have led to classifying cultural makers into three types:

- *Old cultural markers and some website designs: appeared in the old website versions, disappeared in the current versions;*
- *New cultural markers: contains cultural markers and website designs that appear in current websites that did not appear before; and*
- *Shared cultural markers: stable cultural markers and website designs that appeared before and are still used* (Mushtaha & De Troyer, 2009, p. 4).

These three markers will be useful and will be included in the interview questions to get feedbacks from participants: whether the cultural markers used on the paralingual webpage are considered by them to be old, new, or shared markers. The results will be used in the analysis process/phase.

2.3. The Digital Divide

The term digital divide has become an important issue that has concerned scholars and researchers all over the world since the mid-1990s when it was mentioned in a series of survey reports about the 'Haves' and 'Have Nots' prepared by the National Telecommunications and Information Administration (NTIA) (National Telecommunications and Information Administration (NTIA), 1999).

Although the reports were short, to pinpoint the social and cultural issues that are associated with the digital divide, they successfully identified the physical access alone, without including the socio-economic impacts (Tibben, 2007).

2.3.1. History

The term digital divide was mentioned and used for the first time in Larry Irving's report, titled 'Falling Through the Net: A survey of the "Have Nots" in Rural and Urban America' in July 1995.

That report was followed by four other reports, 'Falling Through the Net II: New Data on the Digital Divide' in July 1998; 'Falling Through the Net: Defining the Digital Divide' in July 1999; and 'Falling Through the Net: Toward Digital Inclusion' in October 1999 as a series of survey reports describing the state of ICT in the USA, (National Telecommunications and Information Administration (NTIA), 1999).

Figure 2 shows the vast variations between developed and developing countries or OECD and non-OECD countries respectively- the majority of refugees and immigrants are from non-OECD countries. The data in the Figure 2 shows a huge difference between OECD and non-OECD countries ten years ago and the ratio has not changed yet in 2010.

"In October 2000, there were just over 94 million Internet hosts in the world, with 95.6% in the OECD area and 4.4% outside the OECD area. Growth in non-member countries, mostly those with relatively high GDP per capita, has not matched growth rates in the OECD area" (Organisation for Economic Co-operation and Development (OECD), 2001, p. 8).

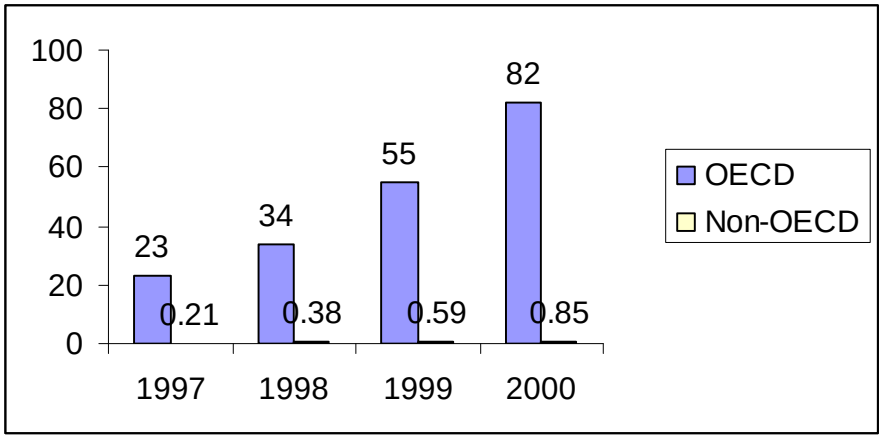


Figure 2 Internet hosts per 1000 inhabitants
(Organisation for Economic Co-operation and Development (OECD), 2001, p. 8).

2.3.2. The World Summit on the Information Society (WSIS)

The limitations of the digital divide on developing countries and even within developed nations were quickly realized by the international community, therefore the United Nations (UN) has quickly responded to the reports that were produced by the NTIA from the US. The WSIS was proposed by the International Telecommunication Union (ITU) in 1998, and then the UN Millennium Declaration Goals (MDS) called for the summit on the information society (Byrne, 2004 a).

> *We are… fully aware that the benefits of the information technology revolution are today unevenly distributed between the developed and developing countries and within societies. We are fully committed to turning this digital divide into a digital opportunity for all, particularly for those who risk being left behind and being further marginalised* (International Telecommunication Union, 2007, p. 15).

The WSIS was officially authorized in 2001 by the General Assembly to convene in two phases. Phase-1 in December 2003 in Geneva, Phase-2 was held in Tunis in 2005, and a final phase is to be held in 2015 to evaluate the action plan that was agreed upon in the previous summits (Byrne, 2004 b).

As far as refugees and immigrants are concerned the eighth principle of the WSIS as shown in Table 4 protects their rights and gives them the prerogative to use their native language in addition to the official languages of the country they live in.

> *The process for the WSIS mandated by the UN General Assembly (Resolution 56/183) in December 2001 clearly recognised that information and Communication Technology (ICT) would have profound impact on global equity and required a committed international cooperation…. The WSIS process, the emergence of serious dialogue around the so called 'digital divide', and the large volume of donor funds being allocated around the world, bear serious testament to the recognition of these needs* (Taylor, et al., 2005, p. 2).

In spite of the enthusiastic response towards WSIS by most countries, however, there were other countries that were not so eager because of ideological and political reasons. *"When George Bush Jr. came to office, the US largely abandoned its digital divide discourses and policies developed by Clinton and Gore"* (Cammaerts & Carpentier, 2006, p. 23).

The New Zealand Bill of Rights Act, 1990, protects the association, language and religious practice of minority groups. *"A person who belongs to an ethnic, religious, or linguistic minority in New Zealand shall not be denied the right to enjoy the culture, to profess and practise the religion, or to use the language, of that minority"* (Ministry of Justice, 2007, p. 6).

Table 4 contains the WSIS's key principles for building an information society in any country. Notice all these principles relate to refugees and immigrants in New Zealand, with explicit emphasis on principles 3, 5, 6, 7, 8, and 9.

Table 4 WSIS key principles for Information Society

Eleven Key Principles for building an Inclusive Information Society
1. The role of the government and all stakeholders in the promotion of ICT for development.
2. Information and communication infrastructure: an essential foundation for an inclusive information society.
3. Access to information and knowledge.
4. Capacity building.
5. Building confidence and security in the use of ICTs.
6. Enabling environment.
7. ICT applications: benefits in all aspects of life.
8. Cultural diversity and identity, linguistic diversity and local content.
9. Media.

10. Ethical dimensions of Information Society.
11. International and regional cooperation.

(Byrne, 2004 a, p. 6 & 7)

2.3.3. The Language Divide, Information Poverty, and Tools to Measure them

2.3.3.1. The Language Divide

Bridging the language divide is when a nation-state such as New Zealand grows an awareness of limiting English monolingualism. A clear demonstration of such a step was the announcement by the New Zealand Ministry of Education in 2003 that all schools are obliged to teach a language other than English from year 7 to year 10. This adoption of the European multilingual language model was forced by the increased migration from Asia starting in the 1990s (May, 2005).

"In 1990 over nine out of ten speakers were first language speakers of English in New Zealand, making New Zealand one of the most linguistically homogenous nation states in the world" (May, 2005, p. 1). Although according to the Māori Language Act in 1987, the Māori language is also an official language of New Zealand. The dominant language used on governmental websites is still, however, the English language (The Office of Ethnic Affairs, 2005).

The Māori people are the indigenous people of New Zealand; they form fifteen percent of New Zealand's population. They often use the term *"Tangata Whenua"* translated as *"People of the land"* (Change Makers Refugee Forum, 2008, p. 1). However, the word Pākehā means a non-Māori person, refugees and immigrants included (Ranford, 1999). Another official language in New Zealand is sign language for deaf people.

Māori communities are inspired by *'Kaupapa'* known as *'Kaupapa Māori'* consisting of the following principles: self-determination; cultural aspiration; culturally preferred pedagogy; socio-economic meditation; extend family structure; collective philosophy; the treaty of Waitangi; and growing respectful relationships (Rangahau, 2009).

The 2001 census indicated that people who were not European, Māori or Pacifica formed fifteen percent of the Auckland population.

> *In the 2006 Census of Population and Dwellings, there were 565,329 (14% of the New Zealand population) people who identified with the Māori ethnic group, 23.7% of them could hold a conversation about everyday things in te reo Māori. Nevertheless, not many government websites are localized to te reo Māori* (Matamoros, 2009, p. 55).

The main ongoing challenges that refugees and immigrants face upon arrival to New Zealand are inadequate English language skills; employment access and contacts; budding helpful networks; and accessing the sort of services and amenities that are available to all citizens including refugees and immigrants (Chile, 2006).

Chile (2006) criticized the shortage of research done on the legal needs of immigrants and refugees.

> *"There is a need for information on how the legal system in New Zealand works, the rights of immigrants and refugees to services, and the issue of access to, and appropriate advocacy and support in, areas such as education, employment, housing, family issues, benefit entitlements, debt, consumers rights, immigration, and the criminal justice system"* (Chile, 2006, p. 87).

Coming to a liberal western democratic society, with respect for individual and community human rights, could be a new experience to most refugees and immigrants who came from autocratic countries. Therefore they need to be educated in civil and political rights responsibilities; the responsibilities of access to human and social services; how the local governance practice works; and how to separate between the power and functions of the government (Chile, 2006).

There were reports of discrimination directed at refugees and immigrants from certain backgrounds, such as people from the Middle East and Muslims, after the 9/11 attacks on the World Centre in New York. Other major types of discrimination were in areas of employment, in accessing services such as education and housing, and neighbourhood discrimination (Butcher, et al., 2006).

There have been reports of mental disorder among refugees and immigrants. Reports showed that one or more of the following factors seemed to be the cause of mental disorders:

1. Distressing experiences prior to migration;
2. Separation from family;
3. Isolation from similar ethnic or cultural background;
4. Inability to speak the English language;
5. Unemployment or underpaid employment;
6. A drop in socioeconomic status;
7. Negative attitudes towards and rejection of immigrants and refugees; and
8. Being a woman where culture, sex roles and values are different (Abbott, 1997).

A paralingual website would help to reduce the causes of pain and disadvantages experienced by refugees and immigrants, because it will give access to information and knowledge that would inform them of their rights and avoid being ambiguous.

Abd Rozan, Mikami, Abu Bakar and Vikas (2005) noted that the language digital divide is defined as any language that does not have a Unicode presentation. Ishida (2007) provided a definition of Unicode as: *"All the characters needed for writing the majority of living languages in use on computers. It aims to be, and to a large extent already is, a superset of all other character sets that have been encoded"* (Ishida, 2007, p. 2).

The authors Abd Rozan et al. (2005) defined the cause of language digital divide as *"Language digital divide is due to the lack or non-availability of appropriate character encoding schemes. Due to this fact, the Universal Declaration of Human Rights (UDHR) website creators have to put text not able to be encoded in the form of PDF or images"* (Abd Rozan et al., 2005 , p. 5).

2.3.3.2. Information Poverty

Defining information poverty will help identify the issues related to immigrants and refugees.

Information is related to data transmission or the transferring of information without human intervention. However, pragmatically information poverty is formatted from the following interrelated perspectives:

- *Related to the inaccessibility of quality, relevant and suitable information;*
- *Co-determined by the absence of a well-developed, well maintained and user-friendly information infrastructure;*
- *Closely linked to the level of education and literacy, particularly information literacy;*
- *Determined by the attitude/approach towards information and the use thereof as well as the understanding of the value that can be attributed to it;*
- *A global phenomenon, but can also occur within the same community and context;*
- *Related to a lack of material and other means to access information; and*
- *Not only an economic occurrence, but has an important bearing on the cultural, political and social spheres of society* (Britz, 2007, p. 76).

From refugees and immigrants' perspectives information poverty is the inability to access useful and important information due to one or more of the above interrelated perspectives. Therefore a paralingual website would contribute to reducing such poverty.

2.3.3.3. Tools for Measuring the Digital Divide

Dewan and Riggins (2005) use three levels of analysis: individual, organizational and global levels, with the association of two types of effect: the first effect concerning inequality in access to ICT; and second effect is concerning inequality of knowledge or ability to use ICT among those who do have access.

The authors gave these definitions to the three levels of the digital divide:

> *Individual level:*
> *Those who are technologically, sociologically, or economically disadvantaged may lack or forgo access to IT, creating a gap between themselves and those who choose to make ICT an integral part of their daily life;*
> *Organizational level:*
> *Some organizations use ICT to gain advantage over their rivals and redefine the rules of engagement within their industry, while others lag behind as technological followers potentially putting themselves at a strategic disadvantage*;
> *and*
> *Global level:*
> *"While some countries are heavily invested in ICT and have adopted policies to promote corporate and individual adoption, other countries are being*

> *left behind technologically"* (Dewan & Riggins, 2005, p. 300).

Figure 3 uses block diagrams to reassemble a conceptual framework for organizing research on the digital divide; therefore, the three levels can be used separately to analyse and measure the two inequality types digital access and digital understanding and thus:

- Come up with innovations such as paralingual layout;
- Make them accessible to target users such as refugees and immigrants; and
- Ensure usage/availability as common utilities on governmental websites.

With the implementation of the theoretical perspectives such as public policy, technical design, economic circumstances, and social issues. Finally the methods used in the digital divide for example survey, analytical modelling, and measurements like using the eye tracking technique.

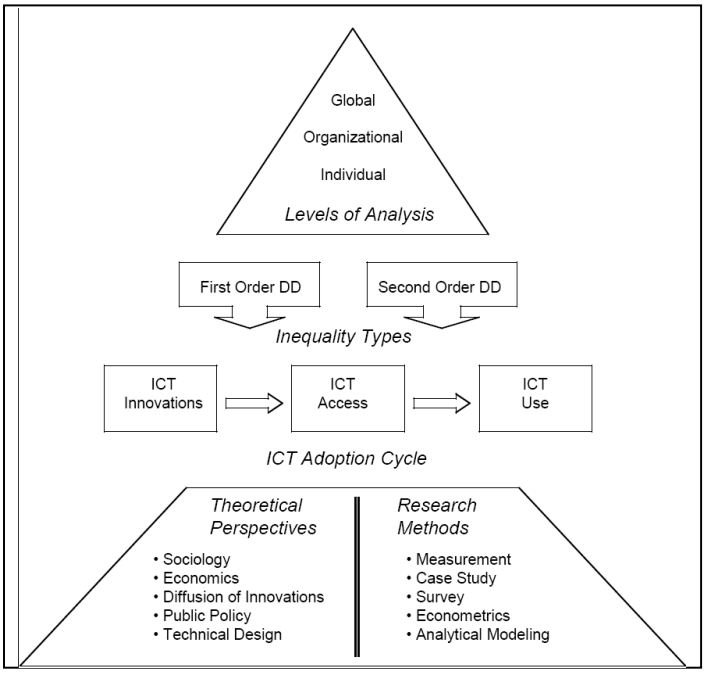


Figure 3 Conceptual Framework for Organizing Research on the Digital Divide (Dewan & Riggins, 2005, p. 32)

There are two indexes used to measure the digital divide in society that are recognized internationally, the Digital Access Index (DAI), and the Digital Opportunity Index (DOI).

There has been criticism of the use of quantitative and statistical methods – based mainly on computers and telecommunication equipment – as the means to measure progress of the Information Society. *"They are technical and market-oriented; comparative measures such as DAI of the ITU, dissimilate the term of the information society as defined by their declaration of principles and the action plan of the WSIS"* (Kouadio, 2008 , p. 17).

Figure 4 shows the platform for DOI, where there are three main factors: opportunity, infrastructure and utilization. Opportunity is affected by three elements mainly by the availability of mobiles and their cost; infrastructure is affected by five elements mainly by the availability of Internet, computers, and fixed line phones; and utilization is affected by three elements mainly by the availability of broadband.

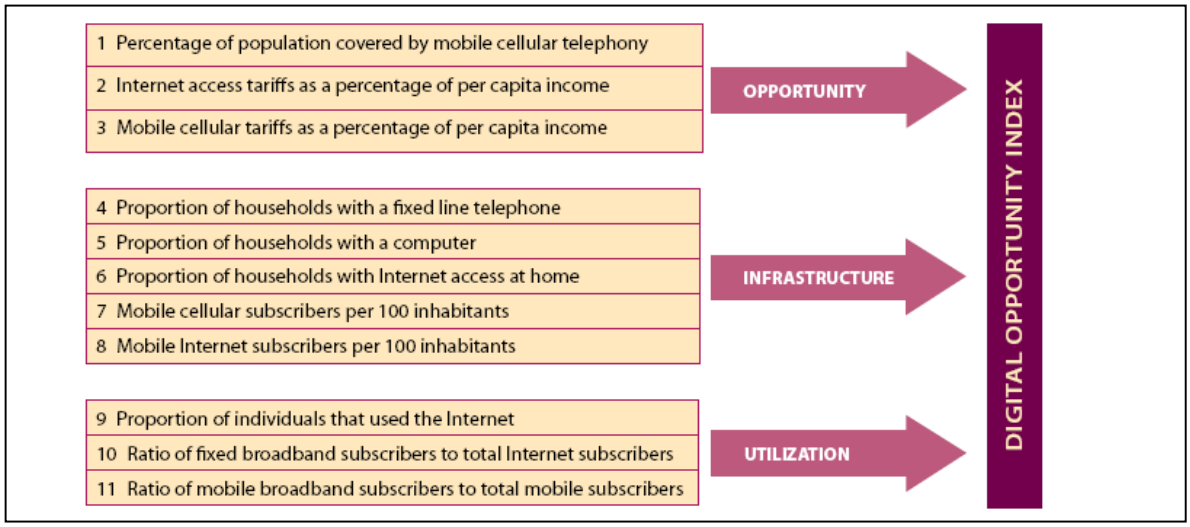


Figure 4 The Digital Opportunity Index (DOI) Platform
(International Telecommunication Union, 2006, p. 42)

Based on the previous information with regards to sorting global digital divide, the following can be concluded: based on money and technology as resources of developed and developing countries, these countries can be classified into four categories:

1. Countries that have both technology and money (Developed Countries), but still have some national and social digital divide issues, such as OECD countries.
2. Countries that have technology, and can get money from selling ICT technologies as revenues (Developing Countries), such as countries in China, India, Indonesia, Malaysia, etc.
3. Countries that have money to buy technology (Developing Countries), such as rich Gulf Countries, and some oil countries in Asia.
4. Countries that have neither money nor technology (Developing Countries), such as countries in the African continent.

New Zealand is classified under category number one, with money and technology and as one of the OECD countries.

2.3.4. The Migrants' Digital Divide in New Zealand and the Initiatives to Reduce it

The digital divide has many forms and shapes, and its effect on society can sometimes cause serious consequences. *"Not knowing how to and being unable to access technologies designed to communicate digital information, such as the Internet, may, in the future, be equivalent to not knowing how to read and write today"* (Kabbar & Crump, 2007, p. 112).

2.3.4.1. Migrants' Circumstances in New Zealand

Kadri (2009) has presented her data using qualitative methods about Arabic speakers living in New Zealand: and Campbell (2002) has presented important information using quantitative methods by using the statistical programme (SPSS) to reveal information about immigrants in general living in New Zealand. She includes their adaptations and non-adoptions to ICT, and their ICT habits before and after arriving in New Zealand.

Campbell (2002) has conducted her research on migrants to different ethnicities: 51% were Asians, which 24% were Chinese, 10% were Indians, 31% were Europeans, 18% were Americans, Africans and Pacific Islanders. Because Arabic speakers' home countries are spread around Asia and Africa, there is a possibility that there are Arabic speakers among Asian and African ethnicities.

Campbell's (2002) results reveal that the majority of migrants were immigrants who arrived in New Zealand under the skilled migrant, business investors and entrepreneur categories. 20% came under the marriage or family reunification category, and only 5% came on a refugee status.

Table 5 shows 2001 census of Middle Eastern communities living in New Zealand. Excluding Afghani, Armenian, Assyrian, Iranian, Israeli, Kurd, and Turkish communities, the remaining Middle Eastern communities are Arabic Speakers.

Table 5 Population of Middle Eastern Communities' in New Zealand 2001 Census

Ethnic group	Number	Percent	Ethnic group	Number	Percent
Afghani	807	5%	Lebanese	1,020	7%
Algerian	63	<1%	Libyan	24	<1%
Arab	2,856	19%	Middle Eastern nec[6]	333	2%
Armenian	153	1%	Middle Eastern nfd[6]	867	6%
Assyrian	1,176	8%	Moroccan	96	1%
Egyptian	939	6%	Omani	3	<1%
Iranian/Persian	2,160	15%	Palestinian	60	<1%
Iraqi	2,148	14%	Syrian	126	1%
Israeli/Jewish/Hebrew	1,596	11%	Tunisian	27	<1%
Jordanian	90	1%	Turkish (incl Turkish Cypriot)	435	3%
Kurd	411	3%	Yemeni	6	<1%
			Middle-eastern people	14,856	104%

nec: not elsewhere classified by Statistics New Zealand
nfd: not further defined by the person filling the census form

(The Office of Ethnic Affairs, 2005, p. 5)

In the 1996 census, there were more than 5,000 Arabic speakers migrants living in New Zealand; in the 2001 census the number rose to 11,000; and in the 2006 census there were more than 17,000 (Kadri, 2009).

> *The term visible minority has been used by some countries, particularly Canada and occasionally in the UK, to denote "non-white"…Caucasian in race or non-white in colour is generally used in reference to people who look different and for that reason are potential subject to discrimination* (Ministry of Social Development, 2008, p. 4-5).

2.3.4.2. Waikato and Hamilton City Ethnicities

In the Waikato District the migrants living there form 2.7% of the population. Hamilton City's population is approximately 130,000 people, 74% of whom are New

Zealand born; 16% are migrants residing in New Zealand more than three years; and 4% are newcomers residing in New Zealand for less than three years (Mhlanga, 2008).

The participants for the usability study in this research will be the Arabic speakers among this 4% of migrants, or the Arabic speakers of the 5200 migrants.

2.3.4.3. The Adoption of ICT Among Migrants in New Zealand

What is more important about Campbell's (2002) research is that she reports on information searched for by migrants using ICT prior to migrating, and after migrating to New Zealand. The information below describes this use of ICT among immigrants prior to coming to New Zealand, and use of ICT among migrants after arriving to New Zealand (Section s 2.3.4.3.1 and 2.3.4.3.2 respectively.)

2.3.4.3.1. Use of ICT among Migrants prior to Coming to New Zealand

Campbell (2002) reports that only 38% of the respondents used ICT prior to arriving to New Zealand to find information to help them immigrate to New Zealand.

Figure 5 shows that migrants searched for the following information prior to their arrival to New Zealand:

- *Information about immigration policies, rules and regulations (77%);*
- *Information about New Zealand such as NZ lifestyle, culture, and history (69%);*
- *Job opportunities (64%);*
- *Education (50%);*
- *Business related matters (20%); and*
- *Others (19%)* (Campbell, 2002, p. 9).

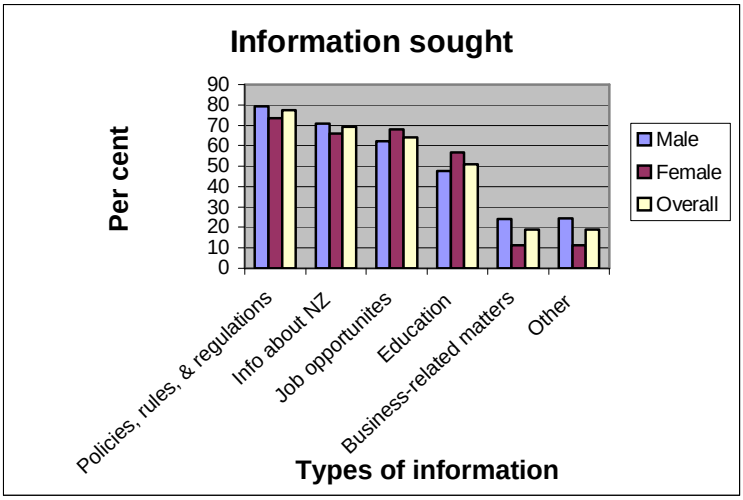


Figure 5 Information About Migrants' use of ICT Prior Coming to NZ (Campbell, 2002, p. 9)

Figure 5 shows that migrants scored most on e-government materials, and that females outmatched men in job opportunities and in education. This shows the need for paralingual websites to help fulfil the needs of new arrivals to New Zealand.

2.3.4.3.2. Use of ICT among Migrants after Arriving in New Zealand

Campbell (2002) reports that the majority of participants 95% were using computers at home after arriving in New Zealand compared with only 38% prior to that. Campbell (2002) also has asked whether it was important to setup websites especially for ethnic groups.

Figure 6 showing why there should be websites set up in NZ for ethnic groups, using surveys showed that migrants were interested in the following:

- *The sites typically had news about the community of people from the specific countries of origin (72%);*
- *Announcement of events in New Zealand that were relevant to the people (59%);*
- *News about the country of origin (56%);*
- *Information about some aspects of New Zealand (52%);*
- *Advice to help people settle in New Zealand (45%);*
- *Other features include items about the culture of the country of origin, entertainment, sports, and religion;*
- *The reasons migrants cited most often for visiting the sites was to find information about some aspects of New Zealand (49%);*
- *To find out what was going on the country of origin (47%);*
- *To read something in their own language (42%);*
- *To connect with people with similar backgrounds (38%);*
- *To be entertained (32%); and*

- *To gain from or provide support to others of the same origin (18%)* (Campbell, 2002, p. 15).

The data collected from the above surveys shows that 42% were interested in reading something in their own language in addition to 45% who were interested in advice to help people settle in New Zealand. Hence, a paralingual website would satisfy new migrants' needs.

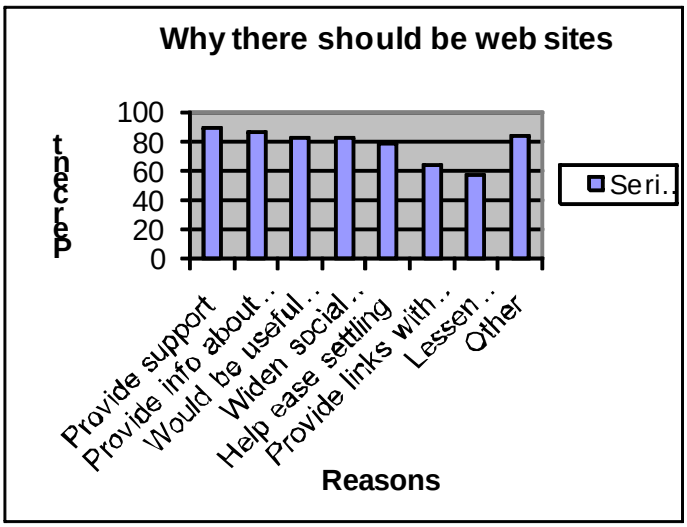


Figure 6 Some of the Reasons for Ethnic Groups' Websites Set up in NZ (Campbell, 2002, p. 14)

Kabbar and Crump (2007) conducted qualitative research to investigate the adoption and non adoption of ICT by migrants who lived in New Zealand from 2002 to 2007. *"The study objectives were to understand recently arrived migrants' perceptions of ICTs; examine the factors that influence migrants' adoption and non-adoption of ICT; and understand the process followed by recent-arrived migrants when adopting ICTs"* (Kabbar & Crump, 2007, p. 113).

The participants who participated in Kabbar and Crump (2007) research were a mix of migrants from different regions namely Africa, Middle-East, Central Asia, and South East Asia, with 32 participants consisting of 17 females and 15 males.

The theoretical framework of Kabbar and Crump's (2007) study has adopted Rogers' (1995) model called the Theory of Diffusion of Innovation. *"The Theory of Diffusion of Innovation consisting of a five stage linear model to identify and explain the*

different stages individuals follow, over a period of time, before they decide whether to adopt or reject innovation (Kabbar & Crump, 2007, p. 114).

A justification of how this theory would benefit this research is explained on the next page following an explanation of Rogers' (1995) model.
Figure 7 shows the five stage linear model developed by Rogers (1995), consisting of knowledge, persuasion, decision, implementation and confirmation.

According to Rogers (1995), knowledge is seeking knowledge about an innovation and exploring the advantages and disadvantages about an innovation. Persuasion is when an individual creates either a positive or a negative attitude about an innovation. Decision is when an individual decides whether to adopt or reject an innovation based on the knowledge gained. Implementation is when an individual starts using the innovation. Confirmation is when an individual evaluates the use of an innovation.

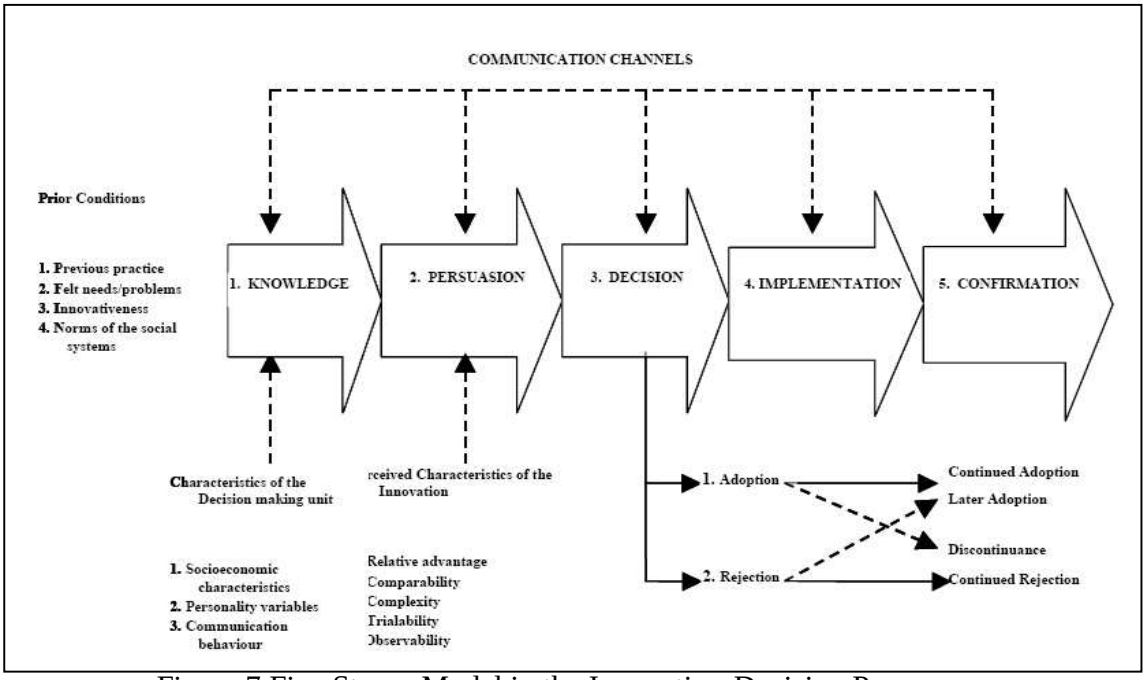


Figure 7 Five Stages Model in the Innovation-Decision Process
(Rogers, 1995, p. 163)

Rogers' (1995) model could be used in the "Localization Provision: The Preference of Arabic Speakers on paralingual webpage layout" research to evaluate the localization provision, as well as in the participants' responses analysis. This process

would allow using the model as a communication channel to evaluate each participant's involvement with ICT (innovation), and what stage each participant is has reached.

The results of Kebbar and Crump's (2007) research revealed the following:

- *19 of the 32 participants were adopters, 8 females and 11 males;*
- *Half of the 15 households had computers. "The convenience of a home computer was believed especially important for female members of the family as it was considered inappropriate, in some cultures, for females to access computers at public places for long periods of time"* (Kabbar & Crump, 2007, p. 5);
- *The main uses for ICT were for communication with friends and family overseas, and listening to news in their native language;*
- *Friends and family were the main factor behind immigrants adopting ICT;*
- *Communicating with family and friends overseas was more economically advantageous than conventional telephone means;*
- *Friends and family were the main source of ICT information: the majority of immigrants indicated that they first heard about ICT from friends or family;*
- *The majority also preferred to learn one-on-one at home, especially older participants who had little or no English; and*
- *Poor English was a big factor for deferring participants to adopt ICT* (Kabbar & Crump, 2007, p. 5).

Here are some of the recommendations made by Kabbar and Crump (2007):

- Promote ICT through community leaders;
- Raise the awareness of ICT applications among refugees and immigrants through education, training courses, and seminars;
- Create a short publication in the refugee native language about useful URLs; and
- Use local schools as training facilities after hours.

The following are some gaps in the Kabbar and Crump's (2007) research:

- The research did not make the distinction between refugees and immigrants;
- The research did not mention the participants' involvement with or their participation in e-government or what aspects could interest them;
- The research did not mention the language line help, which is available on landlines; and
- The research did not mention any success stories or the benefits of adopting ICT by immigrants or refugees.

2.3.5. GOs and NGOs Working with Migrants towards Promoting Information Literacy in New Zealand

Refugees' resettlement process starts once refugees arrive in New Zealand. This resettlement process occurs with the assistance of Non-Governmental Organizations (NGOs), as well as Governmental Organizations (GOs).

> *Since passing the Social Security Act in 1938, New Zealand has established as a cultural norm an individual right to a reasonable standard of living. New Zealand remains a strong example of the welfare state, providing an array of social services for the aged, for caregivers, for the unemployed, and for the disabled. Services to refugees are largely provided within the mainstream system* (Grogan, 2008, p. 7).

The Act in 1938 gives each individual living in New Zealand the right to reasonable living standards. The Ministry of Social Welfare assists disadvantaged people including the aged, unemployed, disabled and refugees until they become independent and able to support themselves. Computers in Homes assists in allocating Personal Computers, and provides training on how to use the Internet, email and basic computer skills via low decile schools (Computers in Homes, 2011).

2.3.5.1. Some of the Governmental Organizations (GOs) Helping Migrants Resettle in New Zealand

1. Immigration NZ Services.
2. Mangere Resettlement Reception Centre (MRRC).
3. National Association of ESOL Home Tutor Scheme.
4. Housing NZ.

The resettlement process includes six weeks stay at the Mangere Refugee Resettlement Centre (MRRC) in Auckland (Kadri, 2009). This stay is aimed at allowing time for new arrivals to learn the laws and the culture or the norm of living in New Zealand. It is not understood why the MRRC does not have a computer room in the centre and a connection to the Internet to allow new refugees to get used to e-government and teach them how to use it. It would be useful to talk to MRRC when the first results of the data that will be collected as part of this research come out.

2.3.5.2. Measures Taken to Teach Refugees the English Language

The following statistics are of people living in the Waikato areas:

- *8.4% of new migrants could not speak English or Maori, 42.9% of these were Chinese, 11.8% Korean, 10.2% Somali, 8.7% Indian, 7.5% Cambodian, and 5.5% Middle Eastern;*
- *3.7% of total migrants could not speak English or Maori, women and older people who have no English prior to migration. Experience the most difficulties learning a new language; and*
- *The top 10 non-official languages spoken by new migrants with no English or Maori are: Chinese, Somali, Korean, Khmer, Arabic, Assyrian, Samoan, Hindi, Tongan, and Japanese* (Ho, et al., 2005, p. 399).

According to Ho et al. (2005), there are 605 refugees who could not speak English, and there are 33 Middle Eastern refugees who could not speak English and enter New Zealand every year, who are in need of paralingual websites.

Refugees are provided with free English language lessons offered by Auckland University of Technology (AUT). Refugees are provided with bilingual sessions to educate them and provide them with information about New Zealand, accommodation, health and education systems, and banking money and finance (Kadri, 2009).

Children undergo preparations in order to be ready to be admitted to primary and secondary schools in Aotearoa New Zealand (Global Education Centre (GEC), 2006).

> *The surveys underline the importance of the commitment of the entire community to the development of language resources. While formal English-Language instruction is extremely valuable for Non English Speakers Background's immigrants, it cannot provide ongoing opportunities for participating in everyday social interaction and community networks, which form much of mainstream life in New Zealand* (White, et al., 2002, p. 160).

Figure 8 shows scores of the following top ten requested languages on Language-line in New Zealand: Mandarin is 51,828; Korean is 19,811; Cantonese is 12,751; Tongan is 8,351; Hindi is 5,743; Spanish is 5,239; Arabic is 4,739; Portuguese is 3,268; and Japanese 3.185.

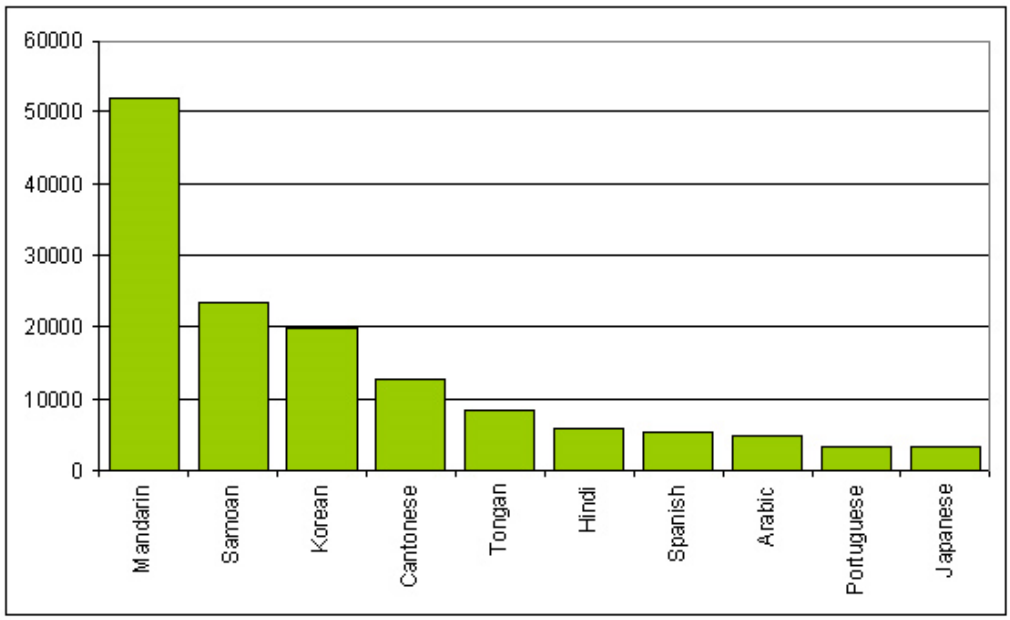


Figure 8 The Ten most Frequently Requested languages on Language-line
(The Office of Ethnic Affairs, 2009, p. 1)

According to The Office of Ethnic Affairs (2009), www.languageline.govt.nz has lists of many participating agencies that use 'Language Line'. Figure 8 shows a list of the top ten languages that are frequently requested on Language Line. *"Over 170,000 interpreting requests have taken place since Language Line first began in April 2003, and more than 50 Agencies use it for everything from arranging an appointment to registering a birth"* (The Office of Ethnic Affairs, 2009, p. 1). However, using bilingual websites in e-governmental is not yet available at present.

2.3.5.3. Some of the Non-governmental Organizations (NGOs) Helping Migrants Resettle in New Zealand:

1. Refugee and Migrant Services (RMS).
2. Refugees As Survivors (RAS) in Auckland (Mental Health Foundation).
3. The New Zealand Computer Society (NZCS) provides information literacy programmes such as the International Computer Driving Licence (ICDL).
4. Waikato Migrant Resource Centre (WMRC) in Hamilton
5. Hamilton Multicultural Services Trust

Refugees and Migrant Services (RMS): its origin was the Inter-church Commission on Immigration and Refugee Resettlement (ICCI), which was established in 1976. The founding members include the National Council of Churches, the Catholic Bishops Conference, Hebrew Immigration Aid Society (HIAS) and the United

Synagogues of New Zealand. After three major restructuring management changes that took place in 1986, 1990 and 2004, the Refugee Services has seen the light in 2008, helping refugees with resettlement issues in New Zealand (Refugee Services Aotearoa New Zealand, 2009).

Refugees As Survivors (RAS) in Auckland (Mental Health Foundation): delivers to refugees high quality, culturally appropriate mental health services such as treatment and follow-ups of pre and post migration stress (Refugees As Survivors (RAS), 2009).

The New Zealand Computer Society (NZCS) has mentioned the following key findings:

1. *Digital literacy is now an essential life skill and the right of every NZ citizen.*
2. *Advancing ICT competence within the workforce would potentially bring about a productivity gain of up to $1.7 billion per annum for New Zealand.*
3. *Adopting an agreed international non-proprietary standard for ICT skills greatly benefits both employers and employees.*
4. *To achieve positive results, programmes that address ICT competence in transitioning workers need to be encouraged at a national level.*
5. *ICT competence can bring significant benefit to marginalized groups, allowing these groups to participate more fully in society* (Bunker, 2010, p. 7).

The Waikato Migrant Resource Centre (WMRC) in Hamilton: New Zealand, provides help through a range of agencies and services as well as exciting events for migrants (Waikato Migrant Resource Centre, 2010). WMRC has agreed to cooperate with this research by providing names of migrants who would be interested in participating in the research; and by presenting the research's information sheet to potential participants.

Hamilton Multicultural Services Trust: they provide the administrative structure for WMRC; they also provide services to help the resettlement of migrants such as the Hamilton Interpreting Service, Migrant Internship Programme, Settlement Support New Zealand, Stepping Up 2 Study, and Computers in Homes (Human Rights Commission, 2010).

Figure 9 shows the major factors affecting mental health, categorized into five factors: pre-migration, migration, post-migration, social and individual. In addition to the factors affecting mental health, that Abbott (1997) reported, there are events such as the terrorist attacks that occurred on 11 September 2001, as a result of which Muslims and people from the Middle East encountered discrimination.

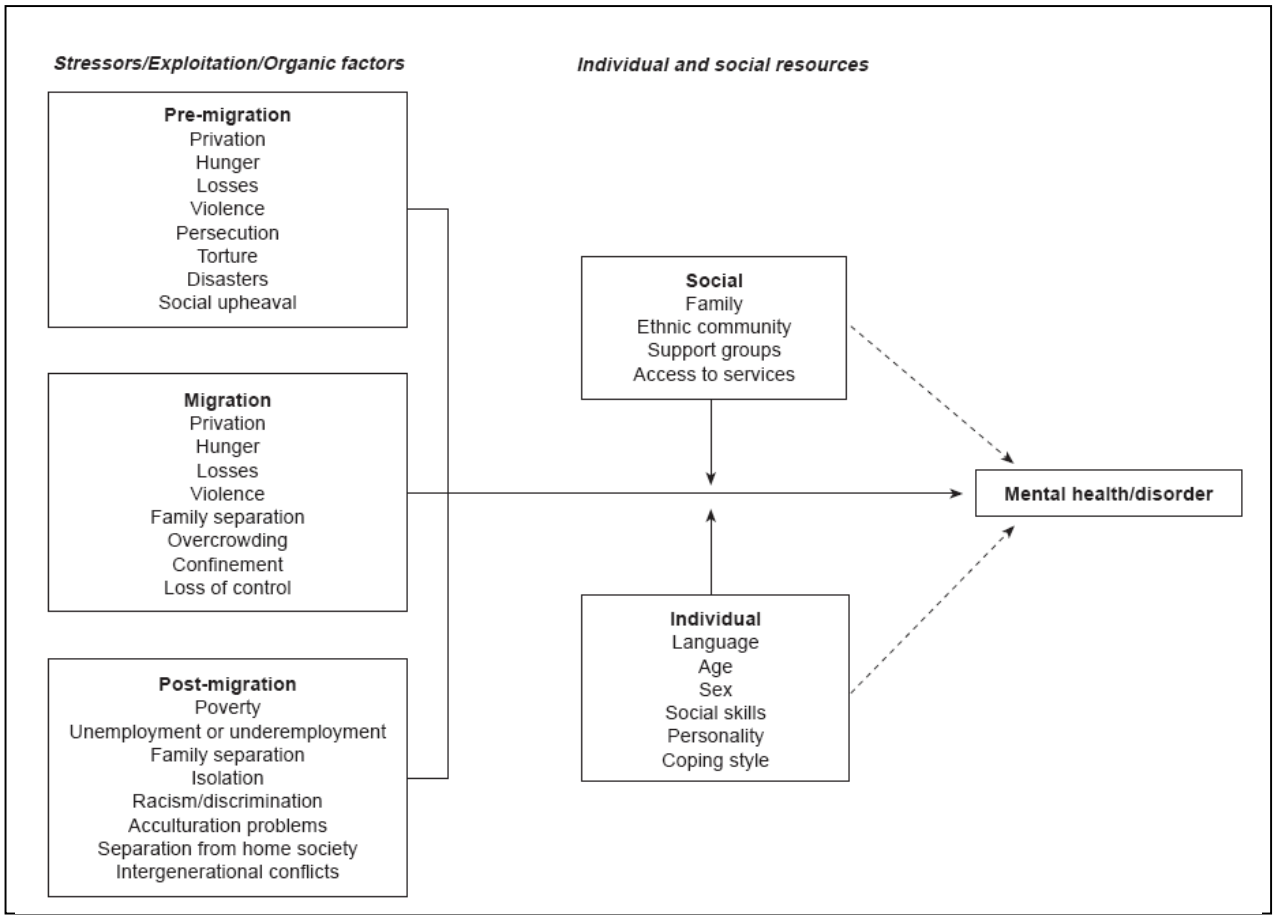


Figure 9 Major Factors Affecting Migrants' Mental Health
(Abbott, 1997, p. 256)

Creating a paralingual website could contribute to improving migrants' mental health, since language is one of the contributors under the individual factor as shown in Figure 9.

2.3.5.4. Arabic Speakers Cultural Centres, Mosques and Islamic Centres in New Zealand

There are 22 Arab countries in the Middle East and North Africa: Algeria, Bahrain, the Comoros Islands, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria,

Tunisia, the United Arab Emirates and Yemen. Being a Muslim should not be linked or equated with being an Arab, as nine percent of Arabs are Christians out of an approximately 300 million Arabic speakers (Kadri, 2009).

There are more than 72% Arabic Speakers living in Auckland, 19% in Wellington, and 9% in Canterbury. The increase in the number of Arabs and Muslims in New Zealand has encouraged them to establish cultural centres, mosques and Islamic centres in order to preserve ethnic and religious beliefs.

2.3.5.4.1. Arab Associations in New Zealand

1. The Arab New Zealand Cultural Society (ANZCS).
2. The Lebanese Society of Auckland.
3. The Somali Friendship Society.
4. The Egyptian Association.
5. The Palestinian Association.

2.3.5.4.2. Religious Muslim Centres

1. The Ponsonby Mosque (Auckland).
2. Abo Baqir Mosque (Auckland).
3. Al-Manar Trust (Auckland).
4. Al-Farooq Centre (Auckland).
5. Blockhouse Bay Islamic Centre (Auckland).
6. Masjid Al-Noor (Christchurch).
7. Jamii Mosque (Hamilton).
8. Al-Huda Mosque (Dunedin).
9. Wellington Masjid (Wellington).
10. Marhaba, Muslim playschool (Auckland).
11. Working Together Group (WTG): they initiate projects and hand them to the local Muslim Community; the group's faith is Islam (The Office of Ethnic Affairs, 2011).

These Arabic speaking cultural and Islamic centres are hubs for those ethnicities, and can be used to settle participants, and to find new refugees.

2.4. Globalization (G11N), Internationalization (I18N) and Localization (L10N)

The Advanced Research Project Agency (ARPA) created the Internet in 1973 for use by the US Department of Defence. In 1984 the Internet services were commercialized, and English language was the language of the Internet (Konečný, 2006).

Internationalization (I18N) and localization (L10N) are the two technical processes of globalization (G11N), as shown in Figure 10.

Internationalization primarily consists of abstracting the functionality of a product away from any particular culture, language or market so that support for specific markets and languages can be integrated easily" (The Localization Industry Standards Association (LISA), 2009, p. 1-2).

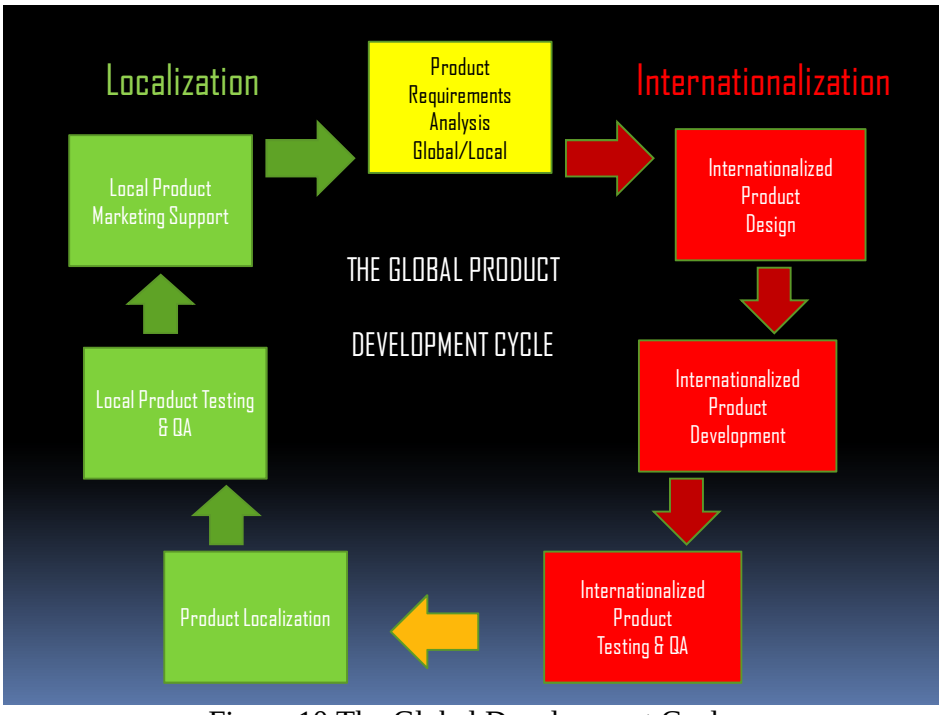


Figure 10 The Global Development Cycle
(The Localization Industry Standards Association (LISA), 2009, p. 1)

On the other hand, *"localization is an integral part of globalization and without it, other globalization efforts are ineffective. Localization is the process of modifying products or services to account for differences in distinct markets* (The Localization Industry Standards Association (LISA), 2009, p. 1-2).

The following subsection will discuss in detail localization and its functions that would help to design and clarify any issues in regards to paralingual websites.

2.4.1. Globalization (G11N)

The term globalization was used as a description of the change in economic, political, technological and social change that the world had witnessed in the late 1980s.

"Globalization involves the enterprise efforts that are necessary to launch a product or service internationally" (Matamoros, 2009, p. 53). *"Globalization addresses all of the enterprise issues associated with making a company truly global. For the globalization of products and services this involves integrating the internal and external business functions with marketing, sales, and customer support in the world market"* (Konečný, 2006, p. 7).

The following are the main factors for the development of globalization:

- *The liberalization and deregulation of key industries;*
- *The emergence of capitalism and free trade as the dominant economic model; and*
- *The creation of seamless worldwide technical and logistic infrastructure: PCs, Internet, fibre-optics, wireless and satellite networks reduced costs and made it easy to connect around the world* (Lommel, 2007, p. 4).

The following are companies' competitive edge after the Internet:

- *A low cost, worldwide advertising and marketing platform;*
- *A low cost worldwide sales platform;*
- *A low cost, worldwide distribution platform; and*
- *A low cost worldwide support platform* (Lommel, 2007, p. 5).

The globalization (G11N) process involves and consists of internationalization (I18N) and localization (L10N), therefore it is essential to understand their qualities in order to apply them to the usability phase covered in the tracking experiment in chapter 5 of this thesis.

2.4.2. Internationalization (I18N)

Internationalization is the first step for product development to achieve localization. *"Internationalization is the process of enabling a product at technical level for localization. This allows the product to handle multiple languages and cultural conventions without the need for redesign"* (Matamoros, 2009, p. 54). Internationalization will have to deal with issues that would prevent successful globalization such as:

1. *graphics may contain embedded text that must be translated;*
2. *screenshots may appear in a particular language; and*
3. *phone numbers in documentation will be usable only in one country* (The Localization Industry Standards Association (LISA), 2009, p. 2).

"Internationalization primarily consists of abstracting the functionality of a product away from any particular culture, language or market so that support for specific markets and languages can be integrated easily" (The Localization Industry Standards Association (LISA), 2009, p. 2). On the other hand, localization involves designing a product especially for a particular culture such as Middle East, and a language such as Arabic, or a geographic location.
"Internationalization is the process of generalizing a product so that it can handle multiple languages and cultural conventions without the need for redesign. Internationalization takes place at the level of program design and document development" (Konečný, 2006, p. 7).

Often people get confused between I18N, L10N and their performances. Again this would help to differentiate between the two for the paralingual webpage design, in the usability study in chapter 5 of this thesis.

2.4.3. Localization (L10N)

The localization process is often misunderstood and gets confused with simple translation: *"localization is an integral part of globalization and without it, other globalization efforts are ineffective. Localization is the process of modifying products or services to account for differences in distinct markets"* (The Localization Industry Standards Association (LISA), 2009, p. 1). *"Localization involves taking a product and making it linguistically and culturally appropriate to the target locale (country/region and language) where it will be used and sold"* (Konečný, 2006, p. 7).

> *Naturally, a large part of international communication is done via the Internet; if one is to share information with the whole world, it can hardly be done in a local language. It should now become clear that localizing websites into English is as important as localizing English websites into other languages* (Konečný, 2006, p. 12).

Figure 10 showed that internationalization should precede localization, hence it is logically sensible to perform internationalization before localization. *"Localization is the process of modifying products or services to account for differences in distinct*

markets. It includes translation, but also customs, conventions, standards and other characteristics of a particular culture or region" (Matamoros, 2009, p. 54).

In other words, localization is essential for this research because it involves the translation into Arabic of the English webpage content, particularly designed for migrant Arabic speakers living in New Zealand.

Figure 11 below shows the responses of twenty three businesses to the impact of localization for them in these organizations. Matamoros (2009) indicated that among twenty three IT businesses in New Zealand who localized their websites, only one did not benefit from the process. Although there were increases in complexity and costs due to the implementation of localization, the process has improved customer experience and increased the market.

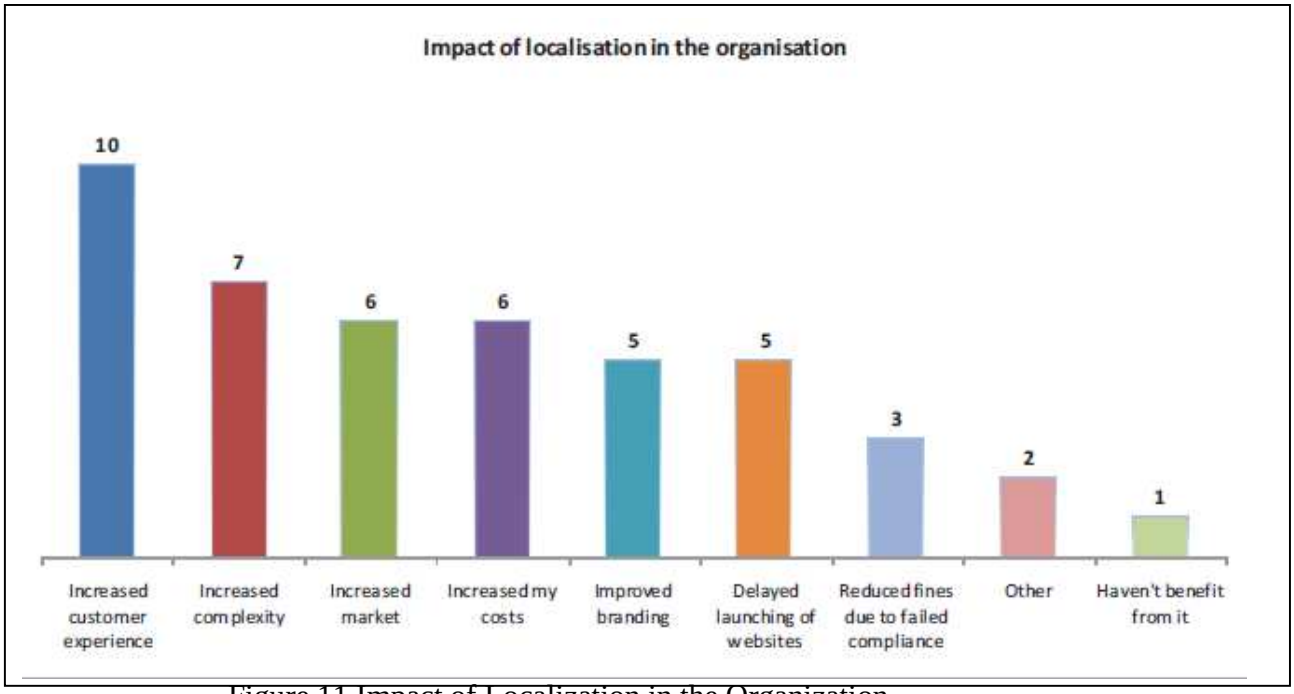


Figure 11 Impact of Localization in the Organization
(Matamoros, 2009, p. 59)

The following are issues that generally involve localization that need to be addressed when performing the usability study and the analysis stages of this research:

2.4.3.1. Linguistic Issues

Arabic language is already listed on Unicode as one of the recognized languages; which is compatible with Windows text editor; and its code is 1256 in the Windows code page.

> *While translation of text generally constitutes the bulk of a localization project, it is seldom the only component and may directly impact other aspects of product design. For instance, a product's user interface may require modification to support characteristics of particular languages or space requirements may need to be adapted for languages that require significantly more or less space than the original language* (The Localization Industry Standards Association (LISA), 2009, p. 2)

2.4.3.2. Physical Issues

Physical issues in localization are issues such as modifying products to be acceptable in the local market and are not only issues related to translation. They may require extra time and cost to localise.

Computer keyboard layout, for example, that includes other languages for targeted markets is one of the localization physical issues.

> *While physical modification is not required for most software and user documentation, physical differences may impact software and documentation that refers to or is embedded in hardware. For example, graphical representations of products or items such as electrical outlets may need to be adapted to reflect the particular hardware used in specific markets* (The Localization Industry Standards Association (LISA), 2009, p. 3).

2.4.3.3. Business and Cultural Issues

This specification is concerned with issues such as local currencies, number formats, colours, graphic (The Localization Industry Standards Association (LISA), 2009).

Particular localization project sensitivities applied in a developed country - such as New Zealand - that uses credit cards online are technically possible. However, this

might not be possible from a cultural point of view in relation to mistrust or lack of confidence when surfing the Internet in developing countries.
Another issue is the use of number format; some Arabic speakers may be used to Hindi numerical presentation like ١=1,٢ =2,٣ =3,٤ =4,٥ =5.

2.4.3.4. Date Formats, Colours, Animals and Money Issues

The Gregorian calendar is used in different formats around the world. For example, June 15, 1960 can be expressed in a number of ways. The US uses 6/15/1960; Europe uses 15/6/1960; and the International System (IS) uses 1960/06/15. The slash (/) also can be replaced by a space, a hyphen (-) or a period (.) (Turner, Sambaino, & El Sahn, 2007).

Colours have been mentioned previously as cultural symbols in Section 2.2.2. Animal images also need to be used considerately to avoid offending religious and cultural beliefs, such as using pigs' images in Arab countries, whereas this image might be used as a patriotic symbol in other western countries.

Money and numerical values also vary around the world. For example, US uses a Billion to means 1000 000 000 a thousand million; on the other hand in the UK a Billion means 1000 000 000 000 a million (Turner, et al., 2007). Therefore such terms needs to be predefined.

2.4.3.5. Technical Issues

The technical issues include matters such as special characters, and writing from right to left; this involves HTML, XHTML and the Unicode Character Set that will be discussed in Section 6.

Another technical issue is the order of names; the USA normally uses First-name Last-name format. On the other hand in directories and lists they appear as Last-name First-name, as they do in the rest of the world in all situations (Turner, et al., 2007).

Arabic speakers use First-name Middle-name Last-name format, and they have a sense of pride in using their fathers' name as their Middle-name, and a lot of people name their first son after their fathers' name.

> *Choosing what to localize and into what languages (and how extensively for those languages) depends on an organization's specific business priorities and needs. Localization is thus another business process, not a task done for its own sake. That said, localization should not be viewed as just a cost, but as the opportunity cost to unlock new markets* (The Localization Industry Standards Association (LISA), 2009, p. 5).

Some of the complications that exist in languages other than the Latin script are: contextual forms, bi-directionality, ligatures, reordering, character positioning and split characters (Ben Henda, 2003).

2.5. Building a Website in Another Language

Since this research involves the building and analysing of paralingual and multilingual websites, it is vital to recognize and summarize the steps and methods that need to be implemented. The following steps will help as guidelines when designing the paralingual website in the usability study stage in Chapter 5 of this thesis:

1. *Download the source code for each page of the site to be localized;*
2. *Change the information on each page to the target language;*
3. *Identify whether any localization issues need to be addressed;*
4. *If so, make a decision about how to change them on the web page;*
5. *Save all the XHTML files as text files (.htm); and*
6. *Check the quality of the content* (Turner, et al., 2007, p. 6).

2.5.1. Tools Used in Localization

Globalization is related to management and business theories, where internationalization and localization are purely technical (Matamoros, 2009). The technology used consists of two groups: language technologies, and tools to manage globalization (The Localization Industry Standards Association (LISA), 2009). This Section moves on to a discussion on language technologies.

Translation is one of the tools used in the localization process, and it is a small part of the process. There are other technical and cultural issues involved; the localization process consists of internationalization and globalization (Matamoros, 2009) as they have been discussed in previous Sections.

2.5.1.1. Language Technologies

Language technologies are divided into three sub classifications:

1. *Terminology Management Systems (TMS): consists of a base dictionary;*
2. *Translation Memory (TM): the text is divided into small sentences; and*
3. *Machine Translation (MT): translates the text by a combination of complex algorithms* (Matamoros, 2009, p. 54).

These language technologies are present today in two main software groups:

- *Localization Workbenches: combine all three language technologies in a single desktop application; and*
- *Global Content Management Systems (GCMS): GCMSs are engineered to facilitate the application and maintenance of the content of websites, their functionality is increasingly being integrated with general content management (CMS)* (Matamoros, 2009, p. 54).

The tendency to use computers has superseded translations by human beings; the first programmes of Machine Translation (MT) were developed in the 1960s. In the 1980s Computer-Aided Translation (CAT) was invented. Figure 12 shows the different stages of translation and human involvement in order to reach CAT (Konečný, 2006).

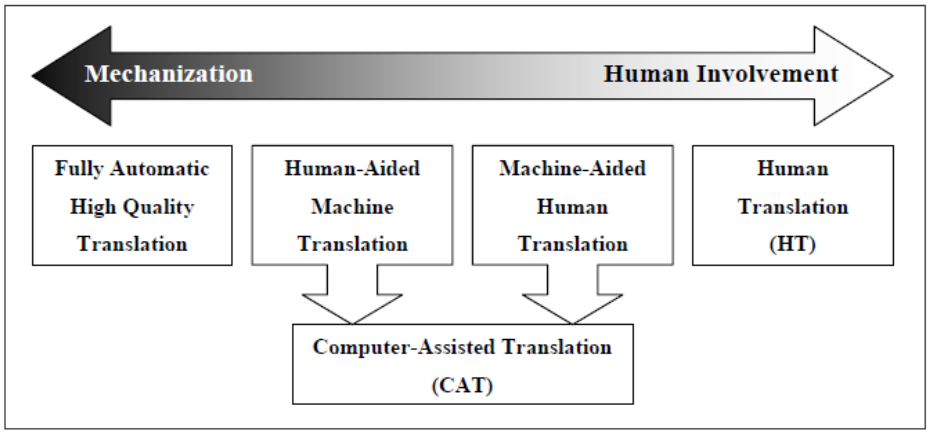


Figure 12 Trends in Translation Technology
(Konečný, 2006, p. 19)

Going into detail about translation tools and how they are technically implemented is beyond the scope of this research.

2.5.2. Tools to Manage Globalization

Tools leads to adopt e-commerce tools and supply chain management such as (SCM) systems; enterprise resource planning (ERP) systems and customer relationship

management (CRM) systems (Frame, 2002). All these systems are used as marketing tools to help manage globalization of a product. These are beyond the scope of this research and will not be used, but it is useful just to point these tools out, in order to cover all the aspects of the topic and comprehend the issues involved.

2.5.2.1. Organizations' Globalization Success

The followings are guidelines for organizations' globalization success:

- *Make the globalization process transparent: direct localization costs are only a portion of the costs of globalization;*
- *Establish actual revenue streams: to have an accurate idea of globalization ROI [Return On Investment], it is important to develop processes to evaluate which versions are actually being used;*
- *Manage globalization cost-effectively: the organizations need to evaluate the impact of their business models on time-to-market and product quality, and how those impact their overall ROI; and*
- *Don't make purchasing decisions based on price alone: organizations that make outsourcing decisions on a price basis alone are likely to achieve substandard results* (Lommel, 2007, p. 41).

The steps that are mentioned above can be seen as a development further for promoting the paralingual website design to interested stakeholders. This will be discussed further in Chapter 9 the recommendation and conclusion chapter.

2.5.3. Reverse Localization

To be able to define reverse localization, it is necessary to define strangeness. An example of strangeness is associating certain products with certain countries. For example perfumes, fashion and romance are associated with France; technology and, engineering are associated with Germany; Macchio, Café con Latte or Espresso are associated with Italy. Hofstede suggested that strangeness is a cause of disruption and chaos, but on the contrary it can be a cause of attraction and differentiation (Schaler, 2005).

"Reverse localization is keeping or intentionally introducing linguistic or cultural strangeness into digital content for a particular target locale with the aim of intentionally differentiating a digital product or service from dominating culture in that locale" (Schaler, 2005, p. 12).

It helps to be aware of such issues concerning localization and paralingual website design to be able to take the right decision, and thus avoid confusion and uncertainty. Similarly, to avoid reverse localization it is best not to introduce strange elements into paralingual websites such as word by word followed by an Arabic translation and vice versa.

2.5.4. The Incentives Behind Using Localization in Arabic Online

Due to the huge rising in purchasing power in the Middle East and Arab countries and the increase in Arabic speakers' purchasing habits using e-commerce, a lot of international companies who were already displaying on their marketing materials and tech manuals in English, German and French are now localizing their online materials by providing Arabic content on their websites.

The following are the incentives behind localization in Arabic:

1. *The majority of Arabic-speaking people are not fluent in the English language.*
2. *Arabic culture is significantly different from western or Asian culture; professional localization services and copy writing are needed to address the needs of consumers from this historically rich culture.*
3. *The proliferation of handheld Internet capable devices has made companies realize that they must communicate with consumers in the Middle East/North Africa (MENA) in their native, Arabic language* (Ahmed, 2010, p. 2).

2.5.4.1. Significant Localization Challenges in Arabic

After revealing the incentives behind localization in Arabic, it is important now to discuss some of the challenges of localization in Arabic that will be analysed in this 'Localization Provision: Arabic Speakers' Preference on Paralingual Webpage Layout" research and the need to use the knowledge and experience of an Arabic Speaking informer in such projects.

The followings are significant localization challenges for using Arabic translation:

1. *Very little modern scientific or technical writing originated in Arabic, which creates a shortage of equivalent terminology. While it is not easy to express some computing or technical terms in the Arabic language, a qualified linguist can create custom Arabic terms that accurately express the exact meanings of the source language terms.*
2. *Many technical terms are translated into the Arabic language through transliteration, or "coining a phrase". This practice makes it*

challenging to find standards for technical terms commonly used in English.

3. *Arabic is a very rich language in term of dialects, accents, registers and styles. Variations in Arabic dialects were influenced by historic and geographic factors. For this reason, it is critical to identify the regional locale of your target audience.*
4. *Arabic is a highly expressive language, with many alternate ways to express a message. Machine translation and "cheap" linguistic resources do not work well with this language.*
5. *The Arabic Language is Right-to-Left (RTL), which will affect page layout and website user interface. For instance the order of table columns must reverse, marginal graphics will "flip", changing places with the accompanying text.*
6. *Arabic DTP (Desktop Publishing) is more labor intensive, as manuals, brochures and flyers required reversed page order. In some cases, photos and images may have elements that direct the readers attention towards the outer edge of the page instead of towards the spine of the book. Alternate photos and images may be required, along with the services of highly professional Arabic Desktop Publishing specialists and graphic designers.*
7. *Although the Arabic Language is RTL, it is also bi-directional (BiDi), which means that numbers and words in Latin based characters will display Left-to-Right (LTR).*
8. *There is still a shortage of professional Arabic linguists who have access to the required linguistic computing environment and Translation Memory (TM) tools. This is a compelling reason to work with a translation/localization partner who frequently works with Arabic language projects.*
9. *Websites or software that offers e-Commerce transactions have additional user interface requirements in Arabic: contextual analysis, rendering and shaping, alternative numeric display, Hijri dates, character extenders for justified text, neutral characters, etc. This is one more reason that it is critical that your Arabic project translation/localization partner must have extensive experience working with Arabic localization* (Ahmed, 2010, p. 3).

The following are commentaries suggesting which of Ahmed's (2010) list of challenges are likely expected to be encountered:

Challenge-1: "A qualified linguist can create custom Arabic terms that accurately express the exact meanings of the source language terms". The Academy of the Arabic Language (www.arabicac.com), is responsible for Arabization of new computing or technical words, but there are a lot of computing or technical terms which have not been Arabized or have no exact translation.

Challenge-2: **"Translating technical terms into Arabic through transliteration or coining a phrase".** This challenge was encountered when I tried to translate "localization, which has no exact and direct translation in Arabic. But by using Arabic basic linguistic measures and scales that are usually used to determine whether such a new word belongs to the Arabic language. The author of this research has come up with a new word that has not been used before. He has contacted the Academy of the Arabic Language to report this occurrence and is still awaiting a reply.

Challenge-3: "Arabic is a very rich language in terms of dialects, accents, registers and styles". This challenge does not apply by using Modern Standard Arabic (MSA). Because MSA will be used for the paralingual webpage layouts, this challenge does not apply, more details were given in Section 2.2.1.1.

Challenge-4. "Machine translation and cheap linguistic resources do not work well with this language"

This challenge can be overcome by employing a literate native speaker.

Challenge-5: "The Arabic language is Right-to-Left (RTL), which will affect page layout and website user interface". This challenge can be overcome by allocating the English language on one line and Arabic on a new line. As for the website user interface, a Dream Weaver website design application will be used to generate and design a webpage to display the paralingual webpage layouts. This is discussed in detail in the usability study in Chapter 5 of this thesis.

Challenge-6: "Arabic Desktop Publishing (DTP) is more labor intensive, as manuals, brochures and flyers required reverse page order". This challenge is in the core of paralingual website designs, but is partially applicable to this research. Images of different layouts will be used in the usability study and in the survey questionnaire.

Challenge-7: "Although the Arabic Language is RTL, it is also bi-directional (BiDi)". This challenge has not affected the paralingual webpage layout designs in this research. By using Microsoft Word Application, the following steps install multilingual languages on Windows 2000 and later versions:

Start →Control Panel→Clock, Language, and Region→Change keyboards or other input methods→Change keyboards→select one of the installed input languages to use as the default for all input fields (Kaplan, 2000).

Challenge-8: "There is still a shortage of professional Arabic linguists who have access to the required linguistic computing environment and Translation Memory (TM) tools". This challenge is not expected to be encountered in this research, because the researcher has good computing and technical backgrounds. In addition an Arabic speaker Professor from the Auckland University of Technology has agreed to act as a consultant if needed.

Challenge-9: "Websites or software that offers e-Commerce transactions have additional user interface requirements in Arabic". This challenge has been overcome, because the researcher is very familiar with Arabic localization.

2.6. Human Computer Interaction (HCI), Web User Interface (WUI), and Graphic User Interface (GUI)

Mankind's ambitions to manipulate machines are limitless. It is obvious that a human brain makes decisions when dealing with computers of how a certain task is to be executed and what to do next. For example it would be more appropriate for users to be able to select their webpage layout online and in real-time when using the Internet.

"The user interface (also known as human computer interface or man-machine interface
(MMI) is the aggregate of means by which people—the users—interact with the system—a particular machine, device, computer program or other complex tool" (El-Bakry, et al., 2010, p. 190).

HCI emerged as an area of expertise in Computer Science, and has since expanded into many other disciplines. Diverse concepts and approaches have produced different epistemologies and paradigm integration (Carroll, 2009).

HCI appeared as a major discipline in computing, and was quickly keyed up by considerable attributions from other fields, such as engineering, psychology, education and graphic design. The effective deployment of interdisciplinary advance has contributed to a global awareness of the importance of HCI not just as an

academic discipline. HCI in practice helps us achieve increased productivity, enhances our quality of life, invigorates competitiveness, and improves the quality of services through the effective design and use of interactive computing systems (Jacko & Sears, 2003).

2.6.1. HCI History

There is evidence of human computer interaction techniques in the field of computer graphics, which became known precisely after the use of CRT and pen devices in 1963. During the 1970s, only information technology professionals were able to interact with computers. The appearance of Personal Computers (PCs) in the 1980s, composed of hardware and software, allowed more people to become users in developed countries (Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI), 2008).

At that time, cognitive science was spreading in different disciplines such as cognitive psychology, artificial intelligence, linguistics, cognitive anthropology, and philosophy of the mind. Cognitive Engineering was a logical systematic and scientifically informed application to emerge from cognitive science, hence HCI is an example of cognitive engineering (Carroll, 2009).

2.6.1.1. HCI as an Interdisciplinary Design Science

HCI is the main core of this research; the following definition of HCI classifies it as a discipline and clears away any ambiguous conception:

"Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them" (Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI), 2008, p. 1).

Shneiderman and Plaisant (2005) explain how HCI began as an interdisciplinary design science.

> *The interdisciplinary design science of human-computer interaction began by combining the data-gathering methods, and intellectual framework of experimental psychology with the powerful and widely used tools developed from computer science. Then*

> *contributions accrued from educational and industrial psychologists, instructional and graphic designers, technical writers, experts in human factors or ergonomics, information architects, and adventuresome anthropologists and sociologists. And now, as computers and user interfaces are becoming the basis for increasingly powerful socio-technical systems, policy analysts, economists, lawyers, privacy advocates, and ethicists are playing a growing role* (Shneiderman & Plaisant, 2005, p.2).

According to Australian and New Zealand Standard Research Classification (2008), this project is defined as a Web User Interaction (WUI), which is grouped with Human Computer Interaction (HCI) under the same category of the Information Systems (Australian and New Zealand Standard Research Classification (ANZSRC), 2008)

2.6.1.2. HCI interrelationship

The Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI) (2008) provides a framework model of six topics between human and computer: (N) the nature of human-computer interaction, (U) the use and context of computers, (H) human characteristics, (C) computer system and interface architecture, (D) the development process, and (P) project presentation and examinations. Some of the interrelationships amongst these topics are demonstrated in Figure 13 (Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI), 2008).

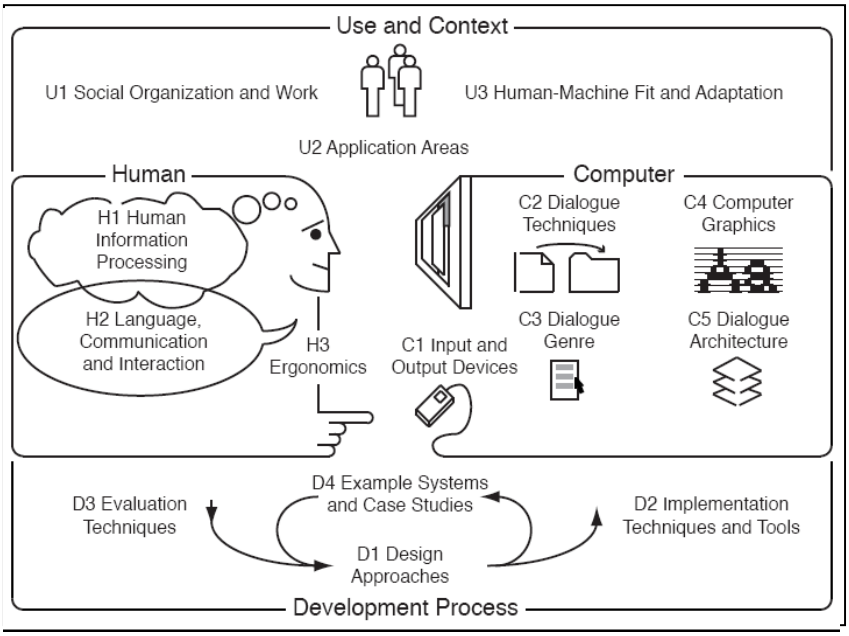


Figure 13 HCI Interrelationships
(Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI), 2008, p. 16)

2.6.2. Different Types of User Interface

There are 25 different types of user interface according to El-Bakry et al. (2010):

1. *Graphical User Interface (GUI),*
2. *Web-based User Interface (WUI),*
3. *Command Line Interface,*
4. *Tactile Interfaces Supplement,*
5. *Touch User Interface,*
6. *Attentive User Interfaces,*
7. *Batch Interfaces,*
8. *Conversational Interface,*
9. *Crossing-based Interfaces,*
10. *Gesture Interface,*
11. *Intelligent User Interfaces,*
12. *Motion Tracking Interfaces,*
13. *Multi-Screen Interfaces,*
14. *Non-Command User Interfaces,*
15. *Object-Oriented User Interfaces (OOUI),*
16. *Reflexive User Interfaces,*
17. *Tangible User Interfaces,*
18. *Task-Focused Interfaces*
19. *Text User Interfaces*
20. *Voice User Interfaces*
21. *Natural-Language Interfaces*
22. *Zero-Input Interfaces*
23. *Zooming User Interfaces*
24. *Brain-Computer Interface (BCI)*

25. Organic User Interface (OUI) (El-Bakry, et al., 2010, p. 191).

From the above list of El-Bakry, et al. (2010), only 1, 2 and 3 are applicable in this research see Chapter 5 on usability.

2.6.2.1. WUI and GUI Frameworks

The WUI is a subsets of GUI, which allows users to interact with the Internet by implementing certain computer applications through using the basic inputs and outputs devices of a computer.

"GUI is an interface between a user and a computer system that involves the use of a mouse controlled screen cursor to select from menus, make choices with buttons, start programs by clicking icons, etc" (The Free Dictionary, 2010, p. 1). Object-Oriented User Interfaces (OOUIs), and application oriented interfaces are two of many different principles used in GUI (El-Bakry, et al., 2010).
WUI is an interface, which allows input and presents output by using web-pages through the Internet enabling users to view them using a web browser programme. Java, AJAX, Adobe Flex and Microsoft.NET, are examples of new applications and technologies used in web-based user interfaces (El-Bakry, et al., 2010).

These two interfaces will be applicable during the usability study stage and when the eye tracking technique is used. These particulars will be discussed in detail in Chapter 5 of this research thesis.

At this stage it is time to discuss tools and techniques that will help accomplish the paralingual webpage designs.

2.7. Tools and Techniques

This sub-Section describes tools and techniques that will be implemented and used in this research. They are considered essential for the research and analysis.

These tools and techniques involve software, computer applications and computing codes such as XHTML, HTML, CSS; the use of entities in web content; the LANG attribute, which is used in text analysis and spell check; and font size.

2.7.1. XHTML, HTML, and CSS

The World Wide Web Consortium (W3C) offers a lot of publications and support materials about web content management and encoding for multilingual websites. Hence W3C is the main international organization that is responsible for the WWW. The materials that W3C offers are written by respected scholars and gurus who have extensive practical experience in this field.

Ishida (2007) describes how to choose an encoding for XHTML, HTML, and CSS documents, defining Unicode as a widespread character set that has all the characters in one place: *"all the characters needed for writing the majority of living languages in use on computers. It aims to be, and to a large extent already is, a superset of all other character sets that have been encoded"* (Ishida, 2007, p. 2).

HTML 4.1 has two attributes, namely 'align' and 'clear' which have values of right and left. CSS is used to right align a specific paragraph.

1. *Using CSS to replace the align attribute.* p#rightjustified [text-align: right;]
2. *Using CSS to replace the clear attribute.* br.clearleft [clear: left;] (Ishida, 2009a, p. 11).

"In order for text to look right when an HTML page is displayed, we need to establish the directional context of that text. We will refer to that context as the base direction for the text" (Ishida, 2009b, p. 10).

2.7.2. Use of Entities

Awareness of entities helps to write web content correctly in Arabic. For example, if you wish to display an Arabic letter in a HTML document you must type the keystroke that produces the character in the editor, or declare the Unicode value of the letter from Windows-1256 as shown in Table 6 with its decimal value (Nelson, 2009).

> *Some HTML editors incorrectly represent Arabic characters as entities. When this happens, it is impossible to use a change in encoding to view entities as Arabic text in an HTML compliant browser. If your editor generates incorrect upper-ASCII entities for Arabic characters, consider switching editors. Otherwise, it will be necessary to hand-edit the HTML to remove them* (Nelson, 2009, p. 3).

Table 6 Charsets for Middle Eastern Webpages

UTF-8	The W3C's recommended encoding. Can represent all characters defined in the Unicode standard.
windows-1252	Windows 1252 (no Arabic characters included)
windows-1256	Windows Arabic codepage
asmo-708	ASMO 708 codepage
dos-720	Arabic DOS 720 codepage

(Nelson, 2009, p. 2)

Nelson (2009) gives an example of the misrepresentation, the Arabic letter beh (ب) which sounds similar to (B) in English:

> *For example, the Arabic beh (ب) is located at decimal 200 in the Windows-1256 codepage. To have the beh show on an HTML document, one must type the keystroke that produces the character in the editor, or explicitly declare the Unicode value (ب). Some HTML pages have used È for the beh. By HTML 4.0 specification the rendered results of È will be the capital letter E with a grave mark above it (È), not the beh. By HTML definition, the ampersand character (&) bypasses the codepage to Unicode mapping and explicitly displays the character specified* (Nelson, 2009, p. 3).

2.7.3. The LANG Attribute

Nelson (2009) goes on to list another technique called the language attribute or LANG, which is used for text analysis as spell checking.

> *The LANG attribute is provided solely to assist with lexical analysis of the text, such as spell checking. It is never to be used to specify the directional layout properties of the HTML document. Currently, there are not many applications that perform proofing tool functionality in native HTML. However, as more applications continue to migrate toward native web support, this attribute could become very useful.* (Nelson, 2009, p. 3).

2.7.4. Font Size

Nelson (2009) describes how to deal with font size in bilingual pages in Arabic and English languages:

> *When a browser views a page with multiple scripts, for example Arabic and English, the default font size may cause one script to be readable but the other to be illegibly small or anaesthetically large. When authoring such pages, the best workaround for this is to set explicit font size attributes for the text. The best way to do this is to set explicit mark-up in style sheets for each script* (Nelson, 2009, p. 3)

Nelson (2009) gives as an example to demonstrate authoring a webpage using HTML and CSS codes as shown in Figure 14. However, the translation made for 'Hello from the Middle East' into Arabic is not quite accurate, the word 'Hello' was translated as 'Welcome' into Arabic, which is not an exact translation for the word 'Hello'. This example demonstrates the problem of machine translation in the absence of a native speaker, which Hemayssi et al. (2005) has also mentioned.

```
<STYLE type="text/css">
SPAN.arabic
  { font-face: Traditional Arabic;
   font-size: 120%; }
SPAN.english
  { font-face: Times New Roman;
   font-size: 100%; }
</STYLE>
<BODY>
  <P>
    <SPAN class="arabic">
      اهلا و سهلا من الشر ق الأ و سط.
    </SPAN>
    <SPAN class="english">
      Hello from the Middle East.
    </SPAN>
  </P>
```

Figure 14 Translation example
(Nelson, 2009, p. 3)

Nichols et al. (2005) raised the issue of maintaining a multilingual project such as the Greenstone digital library Project. "*The problem of maintaining evolving multilingual*

digital-library software system is severe/particularly when the software is open source. (Nichols, et al., 2005, p. 147).

These tools and techniques mentioned above will help to accurately and progressively design the paralingual webpage layouts that will be used in the analysis of this research. Figure 14 is an example of what is involved when implementing a translation to achieve multilingual and paralingual websites using HTML coding.

2.8. Multilingual Websites Designs and Examples

A Multilingual person, who can speak and reads more than one language beside his /her mother tongue, could have an advantage if he/she was able to access the necessary information he/she seeks on the Internet. *"Charlemagne (742/7-814), King of the Franks said: to have another language is to possess a second soul"* (Paradowski, 2015).

The literature is full of articles and examples of multilingual website design that in many cases make use of parallel text, which involves placing a script in English for example together with its translation in Arabic for example an approach similar to paralingual design. Examples of this are the Loeb Classical Library and the Clay Sanskrit Library (Wikipedia, 2015). James Loeb is the founder of Loeb Classical Library, which holds the resources of ancient Greeks and Romans in English translations (Henderson, 2015).

The literature of multilingual websites and parallel texts shows that such websites could be used for language learning. Hence, parallel texts are a highly respected means of learning languages, because they are faster than textbooks, because they make a vast amount of content directly understandable. For example, one could create a table with one row and two columns, then paste one language on the left-hand cell, and the other translated language on the right-hand cell, then make sure that each section or paragraph lines up with its correspondence on the other side (Lypkie, 2011).

In Australia, bilingual education identifies that immigrants' adjustment to a bicultural environment is an accommodation rather than the perfection of the English language;

the educators discovered that the immigrant is selective to which culture choses, therefore the educator's role is to support his/her bilingual and bicultural standing so he/she can adjust the dual culture into a full balance. The research also showed that balanced bilingual texts are considerate of other peoples' needs (Rado, 1976).

In the case of using parallel texts or translation, there is the possibility of the inclusion of lects (contains languages, dialects, or other forms of language, or a variety within a language, having its own rules), and implication from the source language. *"If the typology resulting from parallel text classifies languages together of which the translations are based on the same source language, this of course disqualifies the validity of the typology"* (Cysouw & Wälchli, 2007, p. 5).

Barbosa, Kumar, Sridhar, Yarmohammadi, and Bangalore (2012) highlighted the distribution of languages in the multilingual websites for each country using on the country top-level domain codes.
The result showed that few multilingual websites were present in India and Cuba, whereas Germany, Netherlands, China, and Japan provided a vast number of multilingual websites, and as expected English is the most common foreign language incorporated. It was noticeable also that the geographic and social/economic aspects in each country effected the popularity of collocated languages on that country (Barbosa, Kumar, Sridhar, Yarmohammadi, & Bangalore, 2012). Bateman, Matthiessen, and Zeng (1999) studied multilingual generation and architecture for practical applications and the generation of software diagnostic messages, online help, or online documentation (Bateman, Matthiessen, & Zeng, 1999), whereas Brooks (2014) and Hannon Hill (2012), emphasised the use of a Content Management Systems (CMS), to help the localization process.

> *Even in countries with an official language—the U.K., Canada, U.S., Australia, and New Zealand—there are so many different ways to say the same things. It's important that you familiarize yourself with local customs and use local writers/translators to work on the content* (Brooks, 2014, p. 1).

> *As globalization increases at a steady pace, and localized content is more fully embraced,*

> *businesses and organizations stand to benefit greatly from offering multilingual websites. Whether your company is only just exploring the idea, or has been managing multilingual sites by hand for years, the right CMS can revolutionize the efficiency and quality of your sites* (Hannon Hill, 2012, p. 9).

Hillier (2003), showed that there is a relationship between language, cultural context and usability; the problems of translation; and the process of presenting a multilingual website on the Internet (Hillier, 2003.).

The followings guidelines have been proposed for designing and building a multilingual website:

1. Get translated: it is best not to rely totally on translation software, but rather use local informer;
2. Presenting Language Options: by having more than one language on your website;
3. Encoding and fonts: get your encodings right, such as using a UTF-8 that support many languages;
4. Left to right and right to left: Latin scripts are written left to right (LTR), Arabic script is written right to left (RTL);
5. URL Structure: there are different ways to structure the URLs of multilingual website;
6. Other considerations: dates, ethical concerns, captchas, and phone numbers (Vertommen, 2015).

2.9. Eye Tracking Technique

The eye tracking technique could be considered or should be listed under the tools and techniques sub-section : but because it contains so many details, it has been decided to assign a whole sub-Section to the eye tracking technique on its own. What follows is a resume of important literature concerning eye tracking techniques and how they have been deployed in previous studies, and to make used of results obtained.

The implementation of eye tracking in this research will add a huge value to it. This is because this technique is currently used in marketing researches to measure users' favourite design on webpage layouts; the use of a survey questionnaire, an eye tracking experiment, and a one to one interview following the eye tracking experiment entailing triangulation methods in this research, which will give results

that are more accurate. Such a technique has not been implemented in paralingual webpage layouts' research previously.

The following explains some important characteristics of the eye tracking technique and the issues that one may encounter when it comes to deploying this technique.

The Eye-Tracking Process:

> - *The eye never rest on one position for long; they move several times per second, with micro movements sometimes spanning only a few pixels;*
> - *A fixation is a moment where the eye is relatively motionless, and a saccade is a quick movement between fixation to another element;*
> - *Both fixations and saccades can be determined by eye tracking software from data collected by the eye tracker; and;*
> - *A gaze plot may be used to show the succession of fixations and saccades on a screen or webpage for an individual user, while heat maps show how long each part of a screen has been looked at* (Ehmke & Wilson, 2007, p. 1).

Communication by Gaze Interaction (COGAIN) is an annual conference started in 2005: *"COGAIN is a European Union funded research Network of Excellence which comprises 25 universities, manufacturers and end-user organizations from across the European Union together with partners from across the globe"* (COGAIN, 2009, p.1).

There are three essential articles which describe in detail the eye-tracking technical process:

The first article describing a simplified structure of connectivity is an example of how the eye-tracker sends data to the broker; similar one of these approaches will be used for the project. As shown in Figure 15, please notice that the broker is a Windows' application, which can be reconfigured (Daunys & Vysniauskas, 2009).

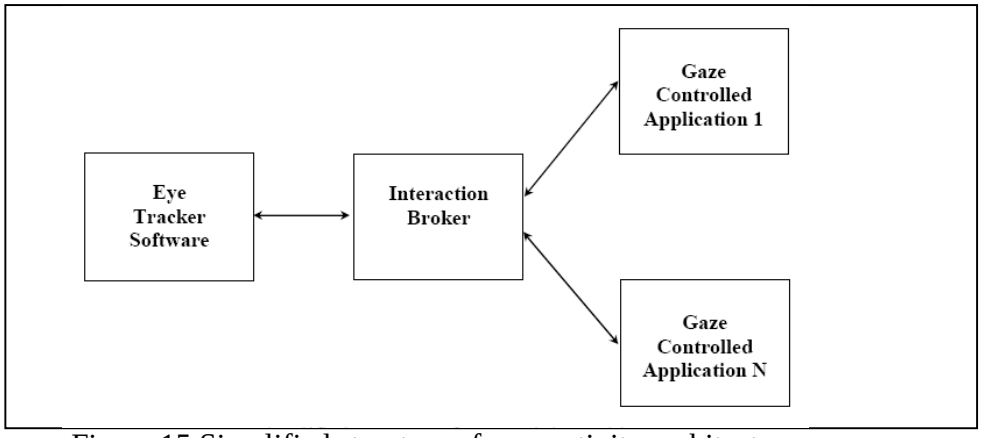


Figure 15 Simplified structure of connectivity architecture
(Daunys & Vysniauskas, 2009, p. 79)

The second article was written by Villanueva, Cabeza, Porta, Böhme, Droege and Mulvey (2008). They argue that the eye tracking system development consists of two areas: image processing area; and image features.

> *There are two main working areas in eye tracking systems development. First, the image processing area is devoted to find the relevant features in the image of the eye, such as glints or pupil. Second, once the image features have been detected a mathematical procedure is needed to translate the image features into the screen or gaze coordinates.* (Villanueva, et al., 2008a, p. 5).
> As shown in Figure 16.

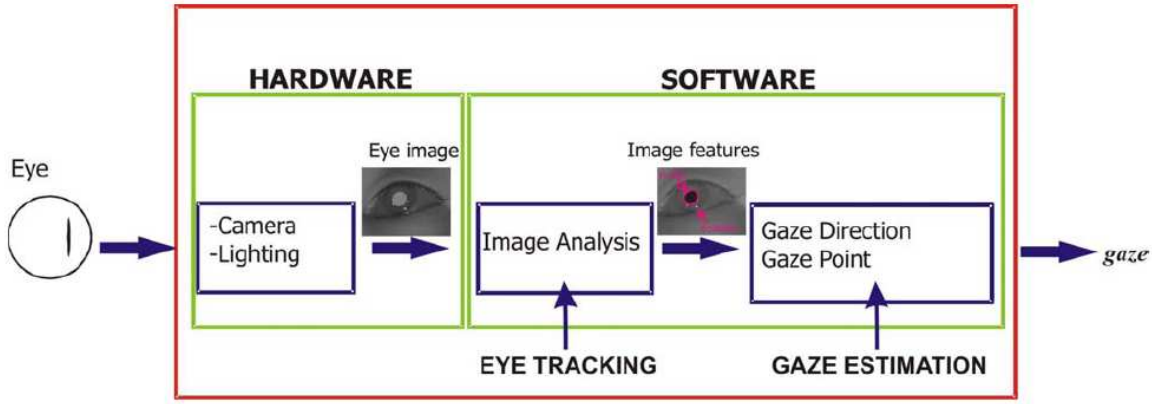


Figure 16 Schematic summary of eye-gaze tracking systems working area
(Villanueva, et al., 2008a, p. 5)

Figure 16 shows how *"Eye tracking focuses on image analysis, i.e. how to estimate working features from the image. [Whereas] gaze estimation is the function that*

connects the image features to gaze data" (Villanueva, et al., 2008a, p. 5). The use of the diagram explains how gaze tracker and eye tracker are not the same thing.

The third article, edited by Novák, Moc, Štěpánková, Uller, and Novákovā (2009), examines and develops a software tool named Testing of Eye Detection Algorithm (TDEA):

> *Schematic summary of eye-gaze tracking systems working area a DB solution offering reliable means for comparison and evaluation of available or new algorithms and their setting based on real life pictures of the considered customer complemented by information about true reference position of the eye (or more precisely centre of its pupil).* (Novák, Moc, Štěpánková, Uller, & Novákovā, 2009, p. 81).

The study demonstrates by using illustrations the process of loading data into the database, as shown in Figure 17.

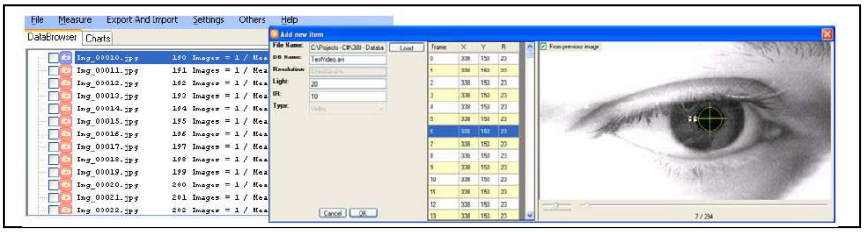


Figure 17 Screenshots: the input data browser, loading data into the database (Novák, et al., 2009, p. 83)

In addition, Figure 18 shows the application process in detail: *"data and algorithm selection, algorithm configuration, process information, storing the results"* (Novák, et al., 2009, p. 83).

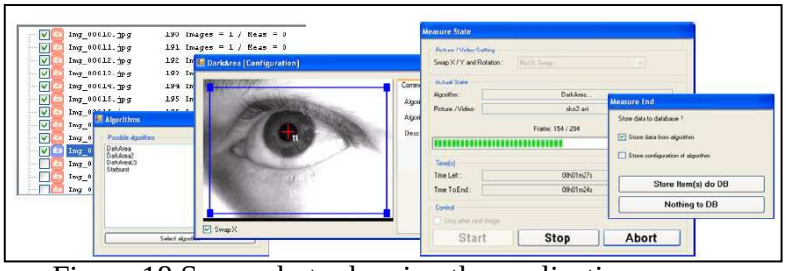


Figure 18 Screenshots showing the application process (Novák, et al., 2009, p. 83)

Figures-19 shows where participant are looking with respect to time; for example, red areas represent the most time participants spent looking; yellow or green indicate the shortest time participants spent looking.

Figure 19 Eye-tracking analyses (PtgGlobal, 2009).

In market research, opinions and preferences cannot predict what the future behaviour or practice of participants will be. Eye-tracking can provide for how participants perceive and process what they see, as shown in Figure 20 (PtgGlobal, 2009).

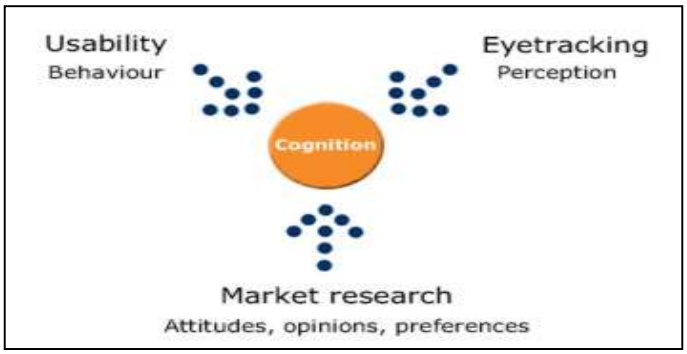


Figure 20 Predicting behaviour (PtgGlobal, 2009, p. 10)

From a philosophical point of view, Sigman (2009) assumed that there is a difference between what people claim they do, and what they really do.

> *What people say they do and what they actually do are two different things. It is not enough to have people report what they think they would do in a particular situation, or even tell you what they are doing right now. In order to really understand, you must watch and see it for yourself* (Sigman, 2009, p. 1).

One of the main stakeholders of this project are participants of both genders; therefore, some Muslim women may have reservation about using an eye-tracking camera.
To resolve ethical issues concerned with this project, a consent form and an information sheet will be used (Suler, 2000).

The HCI Usability lab is available at the Computer Science Department at The University of Waikato which could be used to conduct the eye tracking experiment for data collection by using another method.

Ehmke and Wilson (2007) mention ten Post Experience Eye tracked Protocol (PEEP). The PEEP table could be helpful for carrying out eye tracking technique as shown in Table 7.

Table 7 Post-Experience Eye-Tracked Protocol (PEEP)

No.	**Eye-Tracking Data**	**Interpretation**
1	Long Fixation	Interest or confusion
2	Back-track saccade	Possibly confusion
3	Not looking at elements of a page	
4	Scanning behaviour rather than reading behaviour, that is, fixations and saccades not in left to right order with sweeps.	What was the user looking for?
5	Back and forth between two objects	Trying to make a choice or comparison? Is it distracting?
6	First place the user looks	Why did this draw their attention?
7	Last place the user looks	Why did this lose their interest?
8	When making a choice, fixations back to one item, then final scan before making choice	
9	Reading headings or subheadings, but no more	Boring?
10	Interaction, e.g., following an asterisk to a footnote, or a reference in the text to an image or other element	

(Ehmke & Wilson, 2007, p. 120)

Ehmke and Wilson (2007) also provide a comprehensive coverage of previous literature. The authors classify eye movement metrics into four categories: fixation related, saccade related, scan-path related and gaze related. Pernice and Nielsen

(2009) mention three very good analysis tools in the eye tracking technology: gaze replays, gaze-plots, and heat-maps, and how eye tracking adds another dimension by watching what users are looking at, which adds valuable data to usability researches (Pernice & Nielsen, 2009).

2.10. Chapter Two Summary

Section 2.2 discusses Arabic speakers' characteristics consisting of the Arabic language characteristics and Arabic cultural characteristics, in order to identify major issues for Arabic speakers that prevent them being online.

Section 2.3 discusses aspects of the digital divide including information literacy, as well as the language divide and how they are affecting new migrants.

Section 2.4 defines and discusses localization, internationalization and globalization to explain the incentives and the benefits of using localization and how it differs from internationalization.

Section 2.5 discusses building websites in another language and serves as a guideline to building a paralingual website (The information obtained from Section s 2.5 to 2.8 will be applied in Chapter 5 the usability study).

Section 2.6 discusses HCI to recognize and identify the classification of this research, and provide some commonly used HCI techniques.

Section 2.7 discusses tools and techniques such as HTML, XML and CSS that will assist in the understanding of implementing more than one language on one website.

Section 2.8 discusses eye tracking techniques and gives some examples of experimentation using this technique.

2.11. Next Chapter

This methodology chapter describes how the research will be conducted, sets the research framework, and explains how the anticipated methodology will match or suite the research questions.

A triangulation method or, as it is known, mixed methods will be implemented to collect the data. This will consist of:

1) A websurvey, which will be available online on http://apps.facebook.com/my-surveys/localizationforarabicspeakers, please note that participants do not need to be logged in Facebook in order to participate in the survey.

2) An eye tracking experiment; and

3) One to one interviews following the eye tracking experiment.

Chapter Three: Methodology

3.1. Introduction

This methodology chapter describes how the research will be conducted, sets the research framework, and explains why the anticipated methodology will match or suit the research questions.

This research consists of two studies:

I) Preliminary first study, which will act as an implementation trail designed to implement a triangulation, or as it is known, mixed methods. This will consist of:

1) A websurvey, which will be available online on http://apps.facebook.com/my-surveys/localizationforarabicspeakers please note that participants do not need to be logged into Facebook in order to participate in the survey;

2) An eye tracking experiment; and

3) One to one interviews following the eye tracking experiment.

II) Implementation evaluation second study, which consists of setting up a live website or using a NGO's website such as www.settlement.org.nz, to evaluate the recommendations and outcomes from the first study. This approach resembles an action research approach (This could be an option for further research).

It will be helpful to start by explaining some of the main concepts in the methodology used in the first study for ease of flow and describing the paradigm or framework that will be used.

There are many research approaches pursued in the social science field of discipline, for example qualitative, quantitative and mixed methods or triangulation approaches. This research is categorized in the social science discipline. "*More good can come of social science researchers developing skills in both realms than debating which method is superior"* (Neill, 2007, p. 1).

Research methods are the tools or approaches used to gather data such as surveys, interviews and experiments. Such methods can use qualitative, quantitative, or triangulation. A methodology, on the other hand, describes the research process, and how the research will be carried on, However, epistemology is the theory of

knowledge (Boyd, 2004). Finally, *"Epistemology, method, methodology and theory are linked together. Methodology is often viewed as the place where epistemology, method and theory converge"* (Boyd, 2004, p. 1).

This methodology chapter justifies the choice of methods, and it identifies the theories of knowledge that lead to that choice. For example in the case of using the eye tracking technique to gather Arabic speakers' or participants' preference data, who will be sitting in front of a Personal Computer (PC) scrolling through different paralingual Arabic-English layouts, simulating a real live situation, which makes this experimentation essentially empirical method based on real life observations. *"The method chapter is the place in which the exact steps you will be following to test your questions are enumerated…The method chapter should be viewed primarily as a set of directions or conducting a specific piece of research"* (Rudestam & Newton, 2007, p. 88).

This chapter is organized into different Section s with headings and sub-headings:
Section 3.2 gives a detailed description of the research methods.
Section 3.3 outlines the research approaches:
First, Section 3.3.1 gives a detailed description of different quantitative methods.
Second, Section 3.3.2 gives a detailed description of different qualitative methods.
Third, Section 3.3.3 gives a detailed description of the triangulation or mixed methods.
Last but not least, a full description of the methods used in this research with a justification of the reasons to choose them, and how these methods are in accord with this the research questions.
Section 3.4 lists features of qualitative, quantitative and triangulation research.
Section 3.5 discusses the three phases of the triangulation process and their relation to the research questions.
Section 3.6 describes the participants in relation to the empirical methods used in this research.
Section 3.7 discusses the tools and instruments - such as the computer applications that will be used in the analysis in Chapter 7; also the stakeholder analysis that

explains what power and interest reside with all stakeholders involved in this research.

Section 3.8 mentions the ethics issue and how this research complies with the University of Waikato ethics committee requirements.

Section 3.9 lists the constraints could be encountered when conducting this research. The three major issues are: sample description (participants/subjects); describing instrumentation or research tools used; and procedures for describing for conducting the research as cited by (Rudestam & Newton, 2007).

Section 3.10 summarizes the various resource requirements.

3.2. Research Methods

This Section includes a discussion of both qualitative and quantitative research approaches. Kjeldskov and Graham (2003) present eight research methods used in HCI research as shown in Table 8.

Table 8 Summary of research methods

	Method	Strengths	Weaknesses	Use
Natural setting	Case studies	Natural settings Rich data	Time demanding Limited generalizability	Descriptions, explanations, developing hypothesis
	Field studies	Natural Settings Replicable	Difficult data collection Unknown sample bias	Studying current practice Evaluating new practices
	Action research	First hand experience Applying theory to practice	Ethics, bias, time Unknown generalizability	Generate hypothesis/theory Testing theories/hypothesis
Artificial setting	Laboratory experiments	Control of variables Replicable	Limited realism Unknown generalizability	Controlled experiments Theory/product testing
Environ-ment independ-ent setting	Survey research	Easy, low cost Can reduce sample bias	Context insensitive No variable manipulation	Collecting descriptive data from large samples
	Applied research	The goal is a product which may be evaluated	May need further design to make product general	Product development, testing hypothesis/concepts
	Basic research	No restrictions on solutions Solve new problems	Costly, time demanding May produce no solution	Theory building
	Normative writings	Insight into firsthand experience	Opinions may influence outcome	Descriptions of practice, building frameworks

(Kjeldskov & Graham, 2003, p. 3)

The following are summaries of research methods mentioned by Kjeldskov and Graham (2003).

3.2.1. Case Studies

Case studies are defined as a form of empirical enquiry investigating a phenomenon within the real life context of small size groups.
Its strength lies in using natural setting providing rich data; its weaknesses are time demanding and limited generalizability; and its outcomes are descriptions, explanations and developing hypothesis. Case studies can be useful for explaining events in HCI uses and applications.

This research method is known to have been used in qualitative researches.
An example of it is Segovia, Jennex, and Beatty's study (2009) 'paralingual Web Design and Trust in E-Government'.

3.2.2. Field Studies

These studies usually take place in a real life situation in contrast to laboratory setting and cover both qualitative and quantitative approaches. Their strength is the natural settings and being replicable; their weaknesses difficult data collection, and unknown sample bias; and their outcomes are studying current practice, and evaluating new practices.

In relation to this, HCI localization paralingual research field studies could be applied for the understanding of current practices of users when browsing e-government websites and evaluating the design or theory by conducting experiments in realistic use settings.

3.2.3. Action Research

This kind of study adds to the body of scientific knowledge from the study itself to the research method of scientific knowledge. Its strength in lies first-hand experience, and applying theory to practice; its weaknesses is in ethics, bias, time and unknown generalizability; and its outcome is to generate hypothesis, theory, and testing.
This research method is known or categorized to have been used in qualitative researches.

In relation to this HCI localization paralingual research: Action Research could enhance this researchers' participation in real world activities by introducing solutions and evaluating the effects and validity of the different designs used in this study to record Arabic speakers' preferences on paralingual website layouts.

3.2.4. Laboratory Experiments

This research method is characterized as taking place in controlled settings for the research. Laboratory experiments generate different kinds of data depending on the analysis that follows the experiment. Its strength is in the control of variables and it is replicable; its weaknesses are limited realism, and unknown generalizability; its outcomes are controlled experiments or theory and product testing.

This research method is known for its use in quantitative research. The usual measurement factors of quantitative research are error rate and task completion times. In relation to this research an eye tracking experiment will be conducted to test Arabic speakers' participants' preferences for different paralingual website layouts on a PC with a fixed on camera recording their facial responses.

3.2.5. Survey Research

The survey method enlightens research with information from a known sample of people through questionnaires and interviews, without researcher intervention, using quantitative tools in the analysis**.**

Its strengths are easy, low cost, and can reduce sample bias; its weaknesses are context insensitive, and no variable manipulation; and its outcomes are collecting descriptive data from large samples.

This research method is usually used in quantitative research. In relation to this research, a survey will be used by posting the survey either on an NGO website or by using Surveymonkey.com.

3.2.6. Applied Research

This type of research is built on trial and error depending on the researcher's capabilities for reasoning through intuition, experience, education and induction. Its

strength is that the goal is a product which may be evaluated; its weakness is that it may need further design to make the product general. This is an environment independent setting research. In HCI research this method is relevant to the design and implementation of systems, interfaces and techniques.

3.2.7. Basic Research

This research method involves developing new theories or study whose results need to be verified. Its strengths that there are no restrictions on solutions and it can solve new problems; its weaknesses are costly, time demanding and may produce no solution; and its outcome is theory building. In relation to HCI research this research may be implemented to come up with a theoretical framework to understand certain issues.

3.2.8. Normative Writings

This research includes non-research writings about a phenomenon, or what is known as normative writings. Its strength is to provide insight into first-hand experience; its weakness is that opinions may influence outcome; and its outcome is descriptions of practice, and building frameworks. In HCI research normative writings describe some designs and processes that work well: or if not, then it includes useful insights for future research or design.

3.3. Research Approaches

There are three main research approaches: quantitative, qualitative and triangulation or mixed methods.

3.3.1. Quantitative Approach

The widespread understanding about quantitative research is that it involves the analysis of numerical data, where a number of independent variables are manipulated. The questions that are asked in quantitative research methods involve '*how many, and how often*'; and present a target audience by stating the proportion of the audience that has certain behaviours, preference, behavioural intentions, attitudes and knowledge, whether these specific results are at a statistically significant level. Quantitative research surveys a large group of people using a structured questionnaire

(Haag, 2010). Examples of quantitative research methods, as mentioned above in Section s 1.4 and 1.5 respectively, are laboratory experiments and survey research.

3.3.1.1. Quantitative, Positivist Research Methods (QPR)

QPR is a set of methods or techniques that allow researchers in the Information Systems field to be able to answer research questions concerned with HCI. These numbers are used to represent values as an evidence for those phenomena, and statistical tools are used to analyse them (Straub, Detmar, Gefen, & Boudreau, 2005). Positivism refers to a group of epistemological understandings and philosophies of science that uses scientific methods considered the best to uncover physical and human events (Straub, et al., 2005). Figure 21 shows the epistemological assumptions for both quantitative and qualitative research.

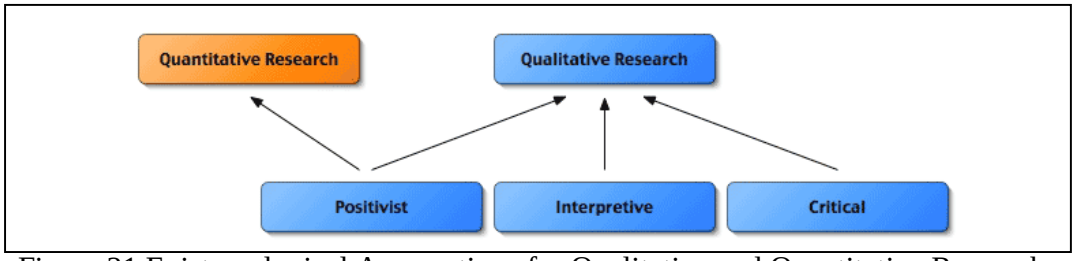


Figure 21 Epistemological Assumptions for Qualitative and Quantitative Research (Straub, et al., 2005)

3.3.2. Qualitative Approach

Qualitative research is more involved in understanding a phenomenon than in explaining it: and hence uses questions such as ‘what’ and ‘how’ more willingly than ‘why’: and analysis is based on revealing explicit and implicit meanings (Fischer, 2006).

An example of a qualitative approach is the research methods mentioned in Section s 1.1., and 1.3, case studies and action research respectively.

The five main reasons for using qualitative methods in information systems are:

1. Understanding how a system’s users perceive and evaluate that system and what meanings the system has for them;
2. Understanding the influence of the social and organizational context on systems use.
3. Investigating causal processes;
4. Providing formative evaluation that is aimed at improving a programme under development, rather than assessing an existing one; and

5. Increasing utilization of evaluation results (Kaplan & Maxwell, 2005, p. 32-33).

Qualitative researchers are those who enjoy learning about people on the human level, can live with ambiguity, and have strong logic and analytical skills (Oliver, 2011).

"Qualitative research is particularly useful for determining the opinions and attitudes of research participants, understanding how specific groups construct their sense of social reality, and discovering the reasons rather than the causes for these opinions" (Davy & Valecillos, 2009, p. 1) . Qualitative research specifies groups of methods and ways of collecting data in contrast to quantitative research (Smith, Bekker, & Cheatet, 2011).

Qualitative data analysis is divided into three categories: sociolinguistic methods or meaning of language; grounded theory or developing a theory; and content analysis or participant's views interpretation (Smith & Firth, 2011).

3.3.3. Triangulation Research

Triangulation is the use of multiple research methods or using two different approaches, such as the quantitative and qualitative approaches, to study one phenomenon. For example, in the qualitative approach one could mix interviews, focus groups and document analysis as multiple sources and that is known as the triangulation research method. *"Triangulation is broadly defined as the combination of methodologies in the study of the same phenomenon. Its metaphor is from navigation and military strategy that use multiple viewpoints allow for greater accuracy"* (Jick, 1979, p. 602).

Bryman (2003) discusses the use of Triangulation, which tends to use more than one approach to investigate the research questions. Triangulation is referred to as Multi-methods research. The following are the four types of triangulation:

1. *Data triangulation, which entails gathering data through several sampling strategies, so that slices of data at different times and social situations, as well as on a variety of people, are gathered.*
2. *Investigator triangulation, which refers to the use of more than one researcher in the field to gather and interpret data.*

3. *Theoretical triangulation, which refers to the use of more than one theoretical position in interpreting data.*
4. *Methodological triangulation refers to the use of more than one method for gathering data*. (Bryman, 2003, p. 2).

Methodological triangulation is what will be used in this research, because there are three methods used to collect data as will be mentioned in Section s 3.5 and 3.6.

3.4. Features of Qualitative, Quantitative, and Triangulation Research

Table 9 lists the features of qualitative, quantitative and triangulation as the main research approaches, where the differences are about paradigm or prototype. In Table 9 both the qualitative and the quantitative columns are cited from Neill (2007). The researcher of this research has added the triangulation column to the table to serve as a pedagogical coherent perception.

Table 9 Features of qualitative, quantitative, and triangulation research

Qualitative	Quantitative	Triangulation
"All research ultimately has a qualitative grounding"	"There's no such thing as qualitative data. Everything is either 1 or 0"	Contemporary social science research depends on more than one research method.
The aim is a complete, detailed description.	The aim is to classify features, count them, and construct statistical models in an attempt to explain what is observed.	The aim is to obtain multiple sources of data.
Researcher may only know roughly in advance what he/she is looking for.	Researcher knows clearly in advance what he/she is looking for.	Researcher looking to induce his/her findings.
Recommended during earlier phases of research projects.	Recommended during latter phases of research projects.	Describing the data gathering phase.
The design emerges as the study unfolds.	All aspects of the study are carefully designed before data is collected.	Consists of both qualitative and quantitative designs.
Researcher is the data gathering instrument.	Researcher uses tools, such as questionnaires or equipment to collect numerical data.	Researcher is using both qualitative and quantitative tools to collect the data.
Data is in the form of words, pictures or objects.	Data is in the form of numbers and statistics.	Data is in the form of words of interviews and numbers of surveys.

Subjective – individuals' interpretation of events is important, e.g., uses participant observation, in-depth interviews etc.	Objective seeks precise measurement & analysis of target concepts, e.g., uses surveys, questionnaires etc.	The objective is to obtain convergent results.
Qualitative data is more 'rich', time consuming, and less able to be generalized.	Quantitative data is more efficient, able to test hypotheses, but may miss contextual detail.	Allow for greater accuracy, but it is time consuming, costly, and hard to replicate.
Researcher tends to become subjectively immersed in the subject matter.	Researcher tends to remain objectively separated from the subject matter.	It allows the researcher to be more confident of his results, and come up with new ways to collect data.

(Neill, 2007, p. 1)

The important things that when techniques are integrated, where both quantitative and qualitative, are considered as contradictory in methods, they are carried-out together on the same research, this is known as mixed methods or triangulation research.

3.5. Methodology Description for this Research

This research consists of conducting three data collection methods: online websurvey, the eye tracking experiment and the interviews. But the outcome of this research could be developed in a second implementation evaluation study, which would consist of designing a live website for further research.

3.5.1. The Protocol or Design of the Triangulation Research

It is essential at this point to restate the research questions, followed by the three research methods used in this research: 1) a survey, 2) an eye tracking experiment, and 3) one to one interviews with the eye tracking participants. The most important, crucial and imminent question is how appropriate are these methods for answering the research questions. These three research methods are implemented into three phases as shown in Figure 22 using a Vein diagram.

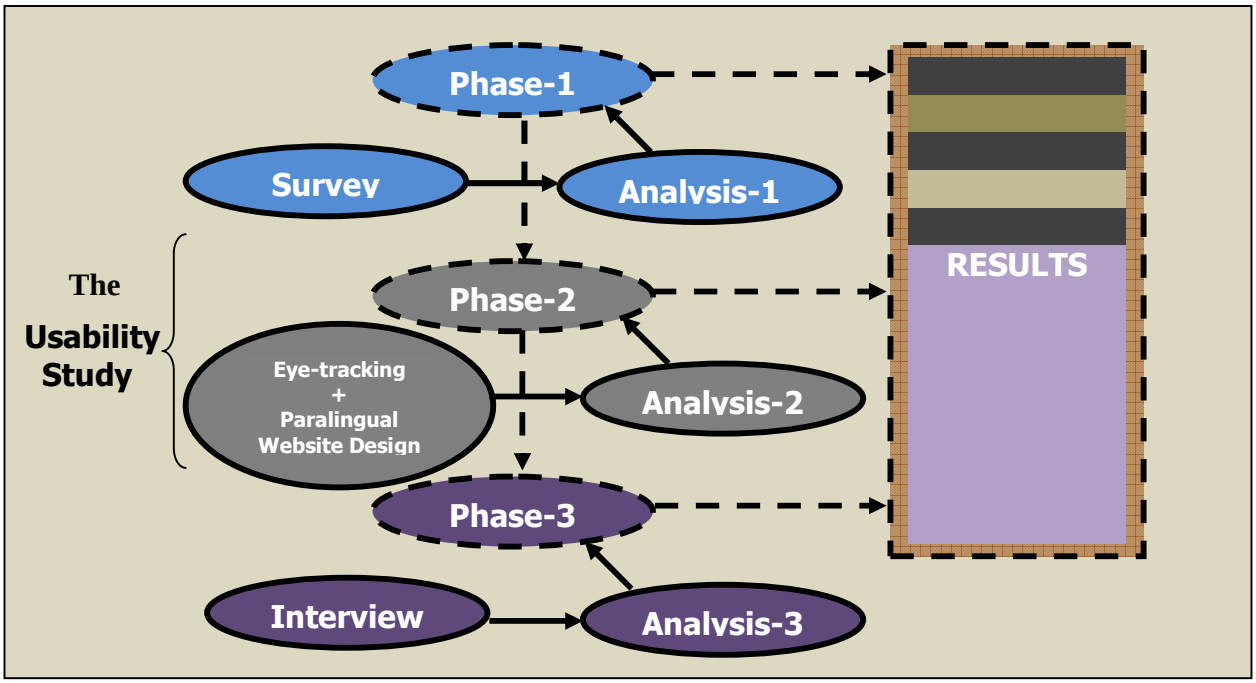


Figure 22 Three phases triangulation protocol for the first preliminary study

3.5.2 The Protocol Design for the Second Case Study (For Future Research)

The preliminary research study consists of the three phases shown in Figure 22 that would provide answers to the research questions.

Therefore, it must be said that a hypothesis or even a refined hypothesis is needed at this stage.

Hypothesis: One of the obstacles that prevent new Arabic speaking migrants from having access to vital information available on e-government sites in New Zealand is the language hurdle. This hurdle can be minimized by the use of paralingual website layouts, which will generate a number of advantages that will favour not only new migrants but all other stakeholders as well.

Therefore, it will be vital to draw recommendations from the results collected from the first phase (Online Websurvey) that will help to implement in the second phase (Eye tracking experiment), then go on to conducting phase three (The Interviews).

3.5.3. Research Questions

The answers to the following research questions require performing the preliminary first study and the implementation of the evaluation for the second study for future research.

Q1. What obstacles prevent Arabic speaking migrants from being online and having access to e-government in NZ?
Q2. What paralingual layout do the majority of Arabic speaking migrants prefer when browsing e-government in NZ?
Q3. What are the benefits of a paralingual e-government website in NZ for Arabic speakers?

Figure 23 contains detailed steps using a block Vein diagram to demonstrate the stages of this research. This design was adopted from a similar design used by Offerman, Levina, Schönherr and Bub (2009).

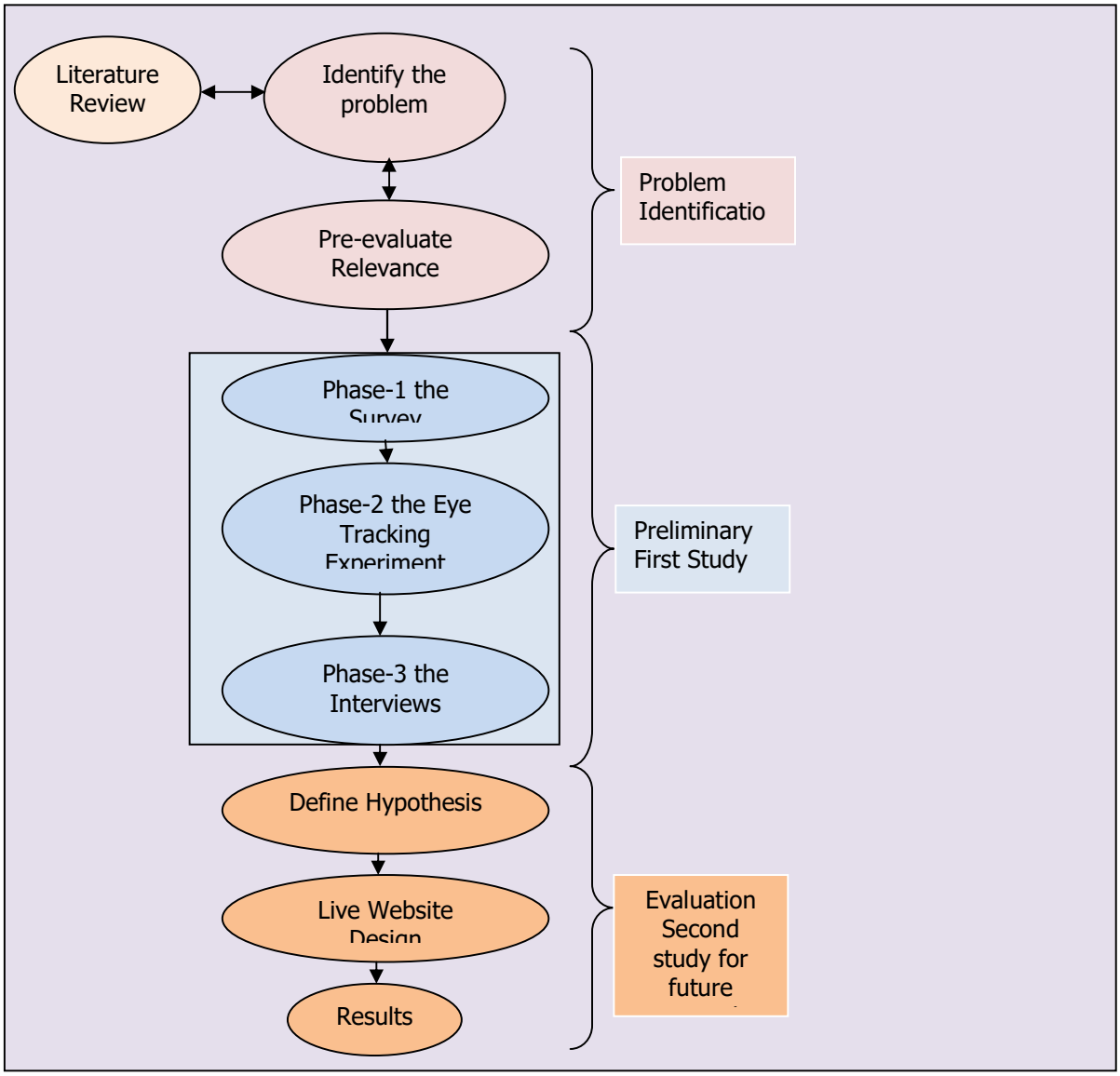


Figure 23 Proposed research process adopted from (Offerman, Levina, Schönherr, & Bub, 2009)

3.6. Participants

The participants for this research consist of two sets: the survey and the eye tracking. The people at the Waikato Migrant Resource Centre in Hamilton, New Zealand, were willing to post an advertisement for this research on their notice board to draw potential participants' attention.

3.6.1. The Online Websurvey

The participants who will take part in Phase 1, the survey, are Arabic speakers of both genders, living in or outside New Zealand; also potential investors or visitors.
The participants living in New Zealand are older than thirty years old and have lived in New Zealand ten years or less.

3.6.2. The Eye Tracking Experiment

Phase-2 will involve 25-30 participants, all from the Waikato and Hamilton area about 100 kilometres south of Auckland, the capital of New Zealand. Phase-2 consists of an eye tracking experiment and a paralingual webpage design containing different paralingual layouts.

3.6.3. Interviews

The participants in the eye tracking experiment in phase-2 will also be involved in the phase-3, the interview following, the experiment.

3.7. Tools and Instruments

Phase-1: surveymonkey.com is a very good tool used to create, manage and analyse surveys.
Phase-2: the usability study, consists of designing paralingual webpage layouts; and the eye tracking experiment uses a camera, PC and an eye tracking device available at the Waikato Computer Science Lab. Examples of different paralingual layouts are show in figures 24-29.

Figure 24 English-Arabic paralingual layouts, by sentence, English on top

Figure 25 Arabic-English paralingual layouts, by sentence, Arabic on top

Figure 26 English-Arabic paralingual layouts, by paragraph, English on top

Figure 27 Arabic-English paralingual layouts, by paragraph, Arabic on top

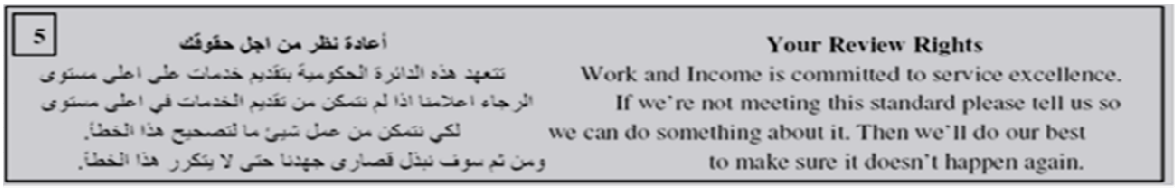


Figure 28 Paralingual layouts, English on the right side and Arabic on the left side

Figure 29 Paralingual layouts, English on the left side, and Arabic on the right side

Phase-3: conducting interviews, following the eye tracking experiment.
A copy of the survey questionnaire and the interview questions are in Appendices (C) and (N) respectively.

There are a number of analysis tools that will be used for this research, such as SPSS for quantitative data in addition to Excel, and NUD-IST for qualitative data.
"SPSS is probably the most common statistical data analysis software package used in educational research and is available at most institutions of higher education" (Muijs, 2004, p. 85).

A stakeholder analysis will also be used to identify those who have an interest in this project. *"Stakeholder Analysis (SA) is a methodology used to facilitate institutional*

and policy reform processes by accounting for and often incorporating the needs of those who have a 'stake' or an interest in the reforms under consideration" (World Bank, 2010, p. 1).

Figure 30 shows a graph diagram of the intersection of Power and Interest, creating four quadrants 1, 2, 3, and 4 representing high power, high interest; low power, high interest; low power, low interest, and high power, low interest respectively. This arrangement could make the analysis of stakeholders easier to visualize by placing each stakeholder in the appropriate quadrant according to the stakeholder's interest and power.

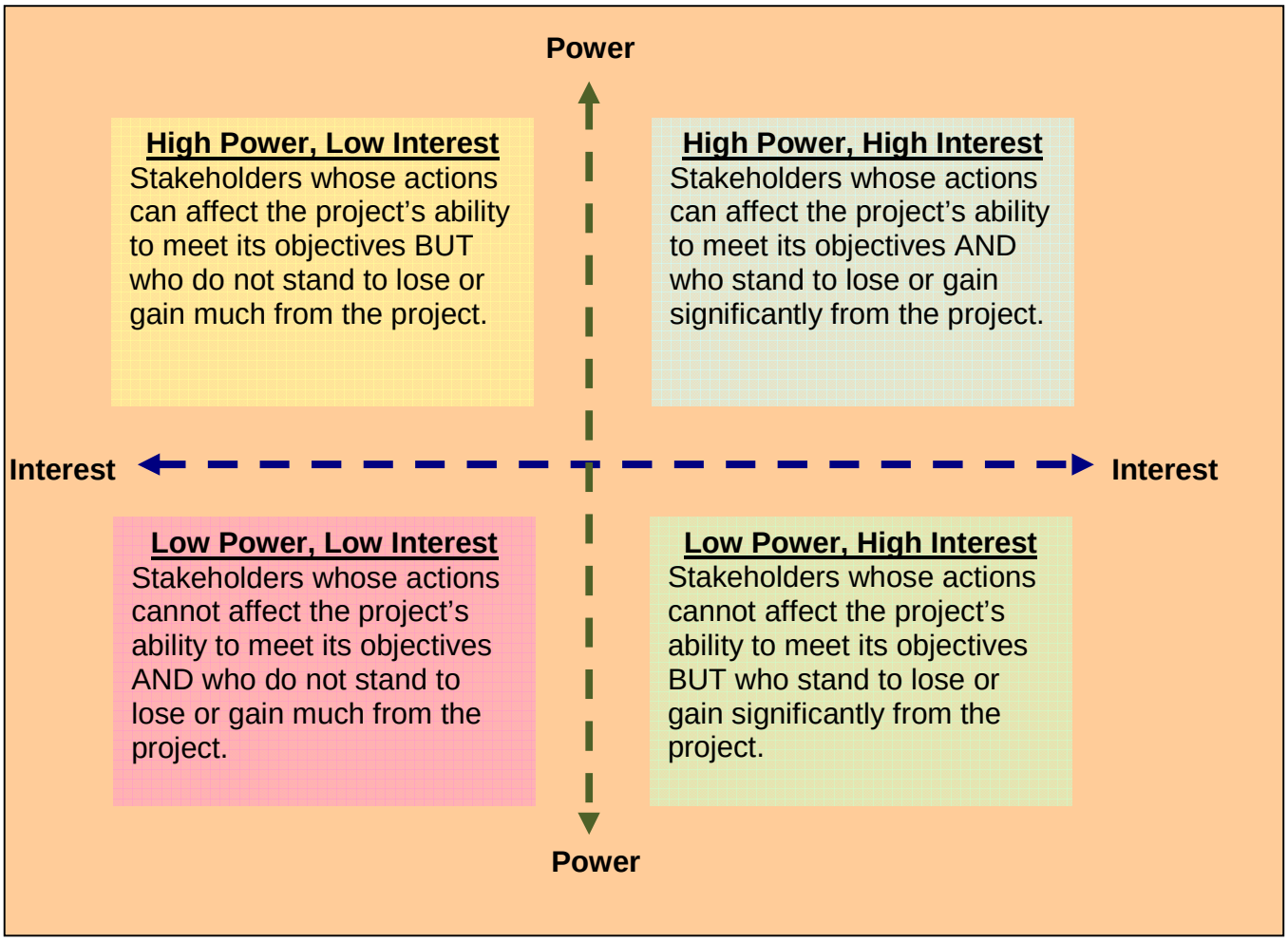


Figure 30 Stakeholders Analysis Based on Power & Interest
(Jagun, 2007, p. 4)

3.8. Ethics

It is very important to comply with the ethics guidelines of the Waikato Computer Science Ethics Committee such as providing a research information sheet, and collecting consent forms for this research. The safety and the comfort of participants are top priorities as well as cultural and religious considerations. The research information sheets and the consent forms in English and Arabic are shown in Appendices (L) and (M) respectively.

3.9. Constraints

A number of potential constraints need to be considered to minimize their occurrence.

- The survey that will be used at present is surveymonkey.com. One of the constraints is the possibility of making a mistake such as analysing the survey sooner than anticipated.
- The population or n =? More participants will produce more accurate results, and vice versa.
- The survey's questions are aimed to give answers to the research questions, therefore any wrong or faulty analysis will affect the accuracy and credibility of this research.
- The eye tracking experiment needs to be controlled to reduce time consumption and produce credible results.
- Extra care needs to be taken when female participants are taking part in the eye tracking experiment, by making sure that the setup does not interfere with their Hijab (Head scarf).
- The interview could be strenuous following the experiment; therefore the interview should be performed before the experiment to reduce stress.

3.10. Statement of Resource Requirements

1. Weekly and fortnightly meetings with the chief supervisor, and monthly meetings with the assistant supervisor.
2. Printing facilities at the University in the labs of G block.
3. Dreamweaver website design application.

4. Using the HCI lab at the University of Waikato to set up the eye tracking experiment.
5. Use of surveymonkey.com or the university survey website to set up a survey questionnaire.
6. During the usability study there will be one to one interviews with participants following the eye tracking experiment in the university premises.

3.11. Timetable for the project

2011: A research proposal and an ethics application are due on June 2011 that will set the stage to begin the data collection phase, and finalize writing the literature review chapter with the possibility of new literature being added.

2012: Design the webpage that will contain the six designs and finalize negotiating with a
NGO to post the webpage on their website: run a test on it: and start collecting data from the surveys. Allocate participants for the eye-tracking technique, and start collecting data and recording interviews. Conclude writing the data collection chapter, and get ready to start the results chapter.

2013: Organize the data results into tables and graphs: organize correlations and relationships, conclude writing the results chapter: and get ready to start writing the data analysis chapter.

2014: Conclude writing the analysis chapter, start writing the discussion chapter, conclude the discussion chapter, and wrap up the whole research.

Appendix R shows a block diagram of the five-year plan to finish the project and thesis writing.

3.12. Chapter Three Summary

Section 3.1 is an introduction that introduces the methods that will be used in conducting this research by listing the steps of the triangulation method, which is introduced in this Section with the following steps:
Survey.
Eye tracking experiment.
Interviews following the eye tracking experiment.
Section 3.2 contains a list of research methods with a detailed discussion of each method organized into subsections.
Section 3.3 gives details on the three major research approaches organized into quantitative, qualitative, and triangulation respectively.
Section 3.4 contains a list of the features of qualitative, quantitative and triangulation research summarized in Table 10.
Section 3.5 gives details of the triangulation approach: the survey, the eye tracking experiment and the interviews following the experiment.
Section 3.6 contains details about the participants of this research and identifies who are they, and how they will be chosen.
Section 3.7 gives details of the research applications that will be used to help in the analysis, in addition to a stakeholder diagram analysis example in Figure 22.
Section 3.8 gives details on how this research satisfies the University of Waikato Ethics Committee's requirements.
Section 3.9 contains a list of the potential constraints to be aware of while conducting this research.
Section 3.10 contains a list of resource requirements for conducting this research.
Section 3.11 contains a timetable for the project and thesis writing.

3.13. Next Chapter

Chapter 4 is the online websurvey as part of Phase-1 of the three phase methodology of the data collection methods. The chapter consists of the following a historical background of web surveys; the types of Internet surveys; issues surrounding web surveys; the advantage and disadvantages; the empirical work involved ; designing a paralingual website to be used in the web survey; the results; and a brief analysis.

Chapter Four: Online Websurvey

4.1. Introduction

Conducting a survey using the Internet is one of the methods used in this research to include a large sector of Arabic speakers in New Zealand, and overseas.

A survey is conducted to test an opinion of a large segment by collecting data statistically from a subset of the population using questionnaires (Schonlau, Fricker, & Elliott, 2002). Similarly a websurvey was conducted to test the opinion of a large population of the Arabic speaking population using a questionnaire.

This chapter discusses the characteristics and features of the Internet surveys including web and e-mail surveys.

In the literature review of Chapter 2 HCI was analysed and described in Section s 2.6.1.2 and 2.6.2.1, where the terms WUI and GUI were explained and showing that Internet surveys are part of HCI. *"The interaction between respondents and online surveys is the basis for applying knowledge from human-computer interaction research to survey methodology"* (Kaczmirek, 2008, p. 15).

The participants needed to choose their preferred layout from among different paralingual layouts that were presented on https://sites.google.com/site/localizationforarabicspeakers/ that resembles the original www.settlement.org.nz website.

This research project uses a Facebook web-survey as one of the methods for data collection via the following website's URL address as part of the empirical work done:

http://apps.facebook.com/my-surveys/localizationforarabicspeakers

Please not that participants do not have to be logged into Facebook in order to participate in the survey.

Since the invention of the Internet nearly thirty years ago, researchers have been enthusiastic to implement and enhance new tools and more innovative applications in conducting research. The tools and applications to conduct surveys have improved in

such a way that encouraged researchers to use their personal computers that are equipped with the hardware and software capabilities (De Vaus, 2002). The advancement in broadband fast Internet connection made multimedia and real-time data accessible too.
The World Wide Web is becoming a new medium to collect data using surveys; on the other hand respondents must be able to access the Internet.

Hypertext Markup Language (HTML) is used after respondents have completed the survey with their responses, and the data then is transmitted electronically (Alvarez & VanBeselaere, 2005).

All these factors have influenced the use of traditional or conventional method to utilize surveys *"The Internet has introduced innovations that have spawned new methods for conducting surveys, most notably surveys done via electronic mail (e-mail) and the World Wide Web"* (Schonlau, et al., 2002, p. 1).

Vate-U-Lan (2007) explained that there are two main factors that affect participation in web surveys as shown in Figure 31:

1. External factors to the project that the researcher has no control over that consist of social, technological, and respondents' characteristics; and
2. Internal factors to the project that the researcher has some control over such as the survey design.

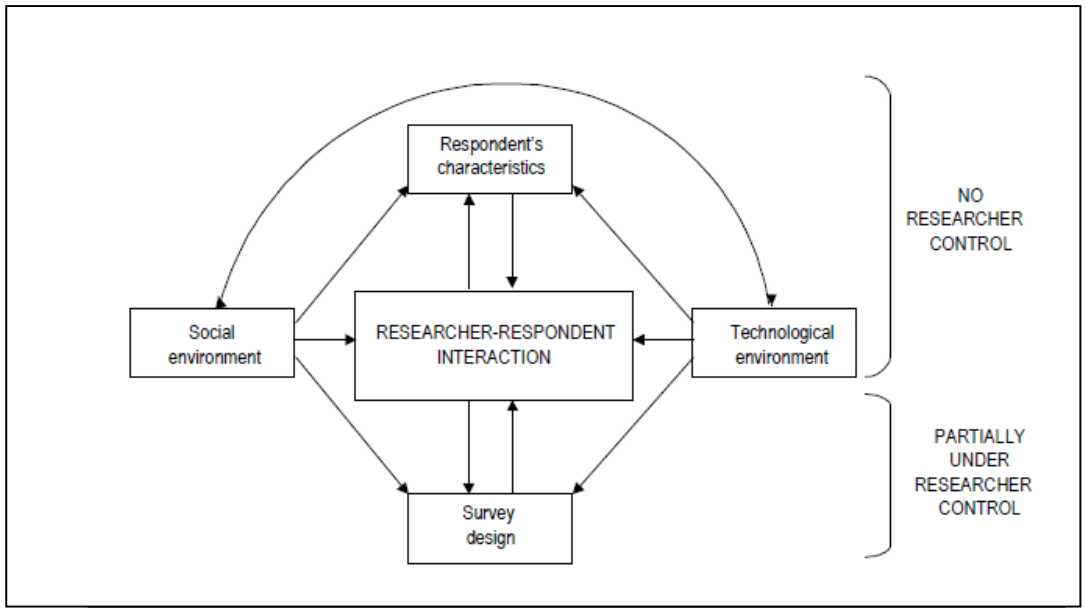


Figure 31Participation in web surveys
(Vate-U-Lan, 2007, p. 4)

The external factor that would have an effect on this research is the technological factor, because if some respondents do not have Internet connection, it would be impossible for them to participate. As part of the participants' characteristics some migrants may not have Internet connection or personal computers due to their economic hardship; or their lack of ICT knowledge.

The literature on web and email surveys is rich, diverse and contains interesting and different issues with regards to utilizing surveys using the Internet. The issues discussed in this chapter draw their arguments from the web survey and email literature. In addition, this chapter includes the empirical work that has been done to design and utilize a web survey and the results obtained from it.

The chapter is organized into the following Section s:

4.2 Historical background of Internet surveys;

4.3. Types of Internet surveys;

4.4. Issues of Web surveys;

4.5. Advantages & disadvantages of Internet surveys;

4.6. Empirical work done;

4.7. Results;

4.8 Data Analysis; and

4.9 A reflective analysis on the advantages and disadvantages of this research's websurvey.
4.10 Chapter 4 Summary.

4.2. Historical Background of Internet Surveys

According to Schonlau et al., (2002), e-mail was used as a survey mode in the late 1980s and early 1990s. Web surveys have become recognized as one of several possible survey modes; by having an entry in the encyclopaedia; have been discussed and presented in well recognized conferences; and have been growing in the business sector to gather consumers' information (Kaczmirek, 2008).

4.3. Types of Internet Surveys

There are two types of Internet surveys as defined by De Vaus (2002):

1. Email surveys: divided into three forms; plain text questions; Word documents or HTML questionnaires; and interactive questionnaire email attachments.
2. Websurveys: are questionnaires combined with the interactive features of the web browser using scripts such as Java, Pearl, Active Server Pages (ASP), Cold Fusion Mark-up Languages (CMF), and Extensible Mark-up Languages (just to name a few).

Table 10 shows different types of web surveys and the various methods used. This research project uses a probability sample and web customized interactive method.

Table 10 Types of Web surveys

Nonprobability Methods	Probability-Based Methods
1. Polls as entertainment	4. Intercept surveys
2. Unrestricted self-selected surveys	5. List-based samples
3. Volunteer opt-in panels	6. Web option in mixed-mode surveys
	7. Pre-recruited panels of Internet users
	8. Pre-recruited panels of full population

(Couper, 2000, p. 377)

The two main types of survey samples that were identified by Schonlau et al. (2002) are:

- Convenience samples: self-selection which are less costly than probability, useful to generate hypotheses, and to perform qualitative data analysis; and
- Probability samples: random samples, samples which can be taken from a closed population, a general population and pre-recruited panels.

Vate-U-Lan (2007) listed the following seven methods of online surveys:

- E-mail (text)
- Web page using HTML
- Web customized interactive
- Web-moderated interviewing
- Bulletin Boards
- Web fixed-form interactive
- Downloadable surveys

(Vate-U-Lan, 2007, p. 23).

Williams (2010) cited Couper (2000) to identify five types of probability-based approaches to target participants to respond to surveys:

> *"1. Approaches that target visitors to a website, using systematic sampling to invite every* nth *person to participate. The frame here is visitors to the site, and this technique is often used in customer satisfaction surveys.*
> *2. List-based samples of high coverage populations, e.g., university students, with invitations to participate sent by e-mail.*

> *3. Mixed-mode designs with choice of completion method.*
> *4. Pre-recruited panels of Internet users, with potential panel members recruited using probability sampling methods such as random-digit-dial telephone surveys.*
> *5. Probability samples of the full population. This method has potential for obtaining a probability sample not restricted to current Internet users"* (Williams, 2010, p. 4).

These five types of probability-based approaches have not been used in this research, because those approaches could be used in traditional paper surveys. Section 4.7.1 describes the approaches used to target participants to respond to a websurvey.

4.4. Issues and Modes of Web Surveys

There are several modes and issues that would help a researcher in research survey design, such as response rate, cost, timeliness, sources of error, and data quality. The followings are issues discussed by Schonlau et al., (2002):

1. Response rate: relates to the size of the sampling population and the survey modes too: it is almost impossible to calculate or predict the response time.
2. Cost: such as the researcher's labour time, and applications used in survey designs.
3. Timeliness: a function of contact, response and follow-up modes.
4. Data Quality:

> *"Data quality can be judged along a number of lines: (1) low unit and item nonresponse; (2) honesty of Reponses, particularly for questions of sensitive nature; (3) completeness of responses, particularly for open-ended questions; and, (4) low error rate in transcription into electronic format analysis, when required by the response mode"* (Schonlau, et al., 2002, p. 16).

5. Sources of Error: a design seeks to reduce all sources of errors. Kaczmirek (2008) listed the following prominent types of errors: coverage error in defining sampling frame; sampling error in drawing from sampling frame; non-response error in respondent/participant refusal; measurement error in respondent response; processing error in assertion of missing data; and adjustment error in weighting or adjustments.

The illustration in Figure 32 draws a relationship between the survey lifecycle and the errors associated with each stage.

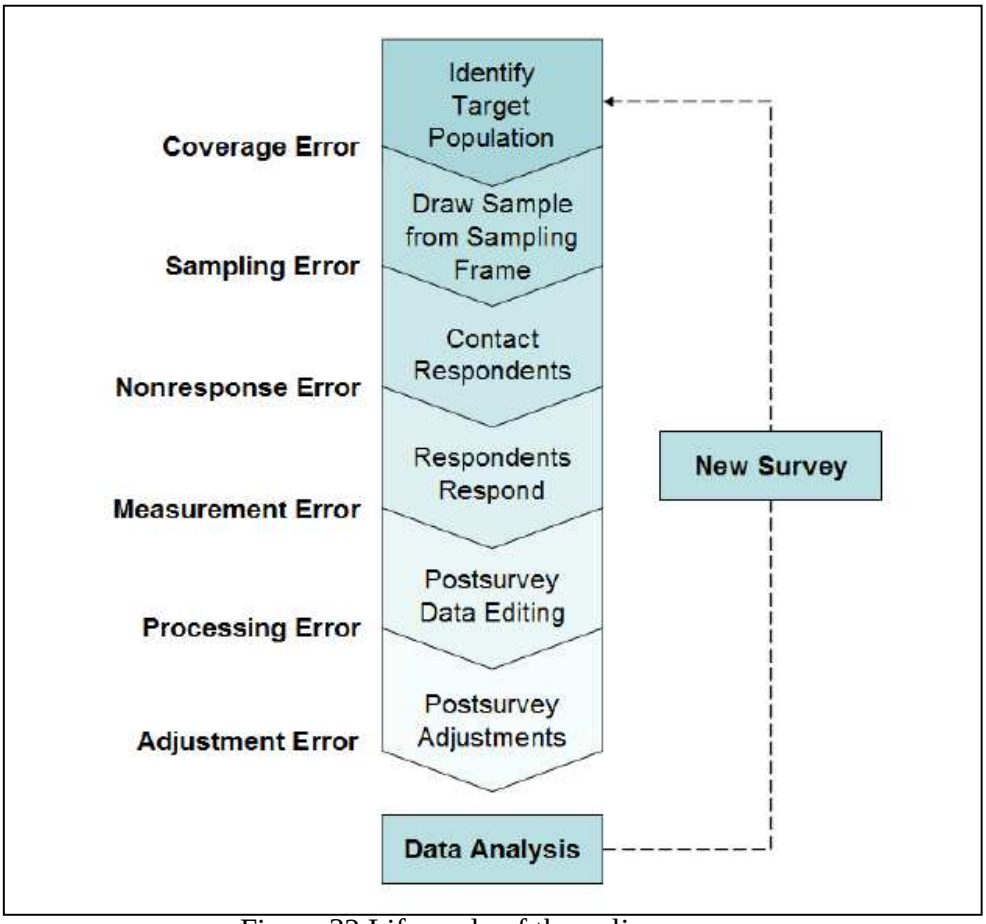


Figure 32 Life cycle of the online surveys
(Kaczmirek, 2008, p. 6)

On the other hand, there are more issues designated by Selm and Jankowski (2006):

1. The aim of the study usually determines whether web surveys are suitable for this particular study;
2. Non-probability is an issue of sampling bias in online surveys, especially if using e-mail surveys.
3. Poor survey questionnaires: this often occurs when questionnaires are designed by people with little or no experience in survey methodology. Simplicity, cultural independence, completeness, relevance and neutrality are required and recommended principles when designing web surveys.

4. Data collection depends on internal and external factors that could be major issues if not dealt with profoundly during the questionnaire design and the type of web survey application.
5. Some researchers or organizations use incentives to increase the response rate to surveys.
6. Data processing: the data that is processed electronically could be analysed directly with automatic coding. IP detection could be used to prevent multiple participation.
7. Supportive technology and software: this could be costly and requires researcher's knowledge of technology and software.

The followings are issues related to this research's websurvey weighed against the issues mentioned above by Selm and Jankowski (2006):

1. Web surveys are used to reach a population with Internet connection such as Arabic speakers who use the Internet to keep in touch with news and family in their home countries.
2. The non-probability for this research's websurvey is not an issue of sampling bias, because the participants are anonymous.
3. The researcher is the informant in this research as being an Arabic speaker, and aware of what would be suitable to include in the questionnaire.
4. The use of Facebook Applications (http://apps.facebook.com/my-surveys) in this questionnaire eliminates most of the internal factors, and it was easy to design as well as easy to analyse. The external factors are also very much under control, because the participants' comments of the websurvey describe it as easy to understand and that straightforward. Please note that participants do not have to be logged into Facebook in order to participate in the survey.
5. There are no incentives offered to participants in this research.
6. The data processing and data analysis is done automatically by Facebook Applications directly, and IP detection to deny multiple participation is done and managed by Facebook Applications.
7. The issues of cost and the researcher's knowledge of technology and software are eliminated in this research, due to using the services provided by

Facebook. More details are given in Section 4.6 describing the empirical work.

"Visual context effects in a websurvey have shown that they can systematically affect responses when their contents have relevance to the survey question" (Couper, Conrad, & Tourangeau, 2007, p. 633). Previous research showed that the use of *"A reminder mail notification had a positive effect on response rate for the websurvey application compared to a treatment in which respondents only received an e-mail containing a link to the websurvey"* (Kaplowitz, Hadlock, & Levine, 2004, p. 100).

The issue of including images in this research's websurvey was a difficult one, because whether to include the different paralingual webpage layouts' images in the actual questionnaire or in another website link was a technical and design decision to make. The complete process of designing the websurvey will be explained in Section 4.6.

4.5. Advantages & Disadvantages of Internet Surveys

E-mail surveys are static and contain a text message delivered using the Internet, which reassembles paper surveys (Schonlau, et al., 2002). On the other hand web surveys offered much more such as multimedia surveys, interactive features and enhanced user interface. Both modes offer instant conduction at small or no cost (Kaczmirek, 2008).

Internet surveys offer a decrease in delivery and response time over paper surveys; are much cheaper; have data quality; population accessibility; and they are faster (Fricker & Schonlau, 2002).

Absence of researcher bias could be more reassuring for respondents in web surveys, and also the anonymity of respondents make web surveys more appealing than e-mail surveys or conventional surveys (Selm & Jankowski, 2006).

Face to face surveys or paper surveys have the researcher's involvement such as answering questions or comments that respondents may have (Fricker & Schonlau, 2002). Sampling error using Internet surveys gets more noticeable in a large population. Other advantages of web surveys are the ease of point and click response;

availability of prepared response; the use of ICT for data collection and transfer; permitting review of the questions due to visual presentation; supple time restraints for respondents; and deployment of adaptive questions to reduce the number and complexity of questions (Schonlau, et al., 2002).

The advantages and disadvantages of using a survey qualitative method are summarized in Table 11. While data collection using the Internet is done to a random sample of assenting respondents, the telephone survey, for example, uses a Random Digit Dialling (RDD) to reach participants (Berrens, Bohara, Smith, Silva, & Weimer, 2001).

> *"While surveys using the web based assessment of mental health can be faster and cheaper than conventional surveys using face-to face or telephone interviews, there are also disadvantages. Interviewers help motivate respondents to see the assessment to the end, whereas web based assessments are more likely to be incomplete"* (Heiervang & Goodman, 2011, p. 76).

Having said that, many studies show that a websurvey is more favourable than conventional paper surveys among students and young people, especially when the survey is IT related (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003). *"Web surveys like other methods of survey data collection, have strengths and weaknesses. Much of the research over the past several years has focused on identifying these strength and weaknesses and finding ways to overcome the former and exploit the latter"* (Couper & Miller, 2008, p. 834). It seems that the authors were sarcastic about researches done in previous years.

Table 11 Advantages and disadvantages of Internet surveys

Advantages	Disadvantages
Can complete structured questions with many stakeholders within a relatively short time frame.	More difficult to collect comprehensive understanding of respondents' perspectives (In-depth information) compared to in-depth interviews or focus groups.
Can be completed by telephone, mail or in-person.	Can be very expensive.
It is quantifiable and generalizable to an entire population if the population is	Requires some statistical knowledge, sampling and other specialized skills to

sampled appropriately.	process and interpret results.
Standardized, structured questionnaire minimizes interviewer bias.	
Tremendous volume of information can be collected in short period of time.	
Can take less time to analyse than qualitative data.	

(The University of Totonto, 1999, pp. 1-2)

Data security and confidentiality are very important in web surveys, and it is vital to ensure that stored data is secured and protected (Austin, Richter, & Reinking, 2008). However, it is also mandatory to dispose of the saved data after this research is finished, as part of the ethics agreement at the university. The literature overview indicates that there are response rate differences between web surveys and other survey modes. A websurvey response rate is lower due to security and privacy concerns (Manfreda, Bosnjak, Berzelak, Hass, & Vehovar, 2005).

4.6. Empirical Work

This Section describes the steps that have led to the design of the web survey for this research, but before discussing the steps that have been attempted in the online survey phase of this study, it would be useful to compare them with the steps mentioned in the literature. The following are steps to conduct a survey in general, including phone, mail, face to face, and fax:

1. *"Clarify purpose: why conduct a survey? Who are the stakeholders? Who is the population of interest? What issues need to be explored?*
2. *Assess resourses: what external resources will you need? Which in-house resources can you make use of?*
3. *Decide on methods: select the method which is most appropriate;*
4. *Write questionnaire: decide on what questions to ask, set the types of response formats, set the layout of questionnaire;*
5. *Pilot test/Revise questionnaire: pilot test the questionnaire, revise the questionnaire;*
6. *Prepare sample: decide on the sample design, identify sources of sample;*
7. *Train interviewers;*
8. *Collect data;*

9. *Process data: code the data, data entre the information;*
10. *Analyse the results;*
11. *Interpret and disseminate results; and*
12. *Take action"* (The University of Totonto, 1999, p. 2).

The twelve steps above listed by The University of Toronto (1999), were very helpful, and were used as a road map of the websurvey for this research:

1. Clarify purpose: The reason behind conducting a websurvey in this research is to get a response of the general population of Arabic speakers on the different paralingual webpage layouts. The stakeholders are Arabic speakers with Internet connection who use the Internet to browse e-government websites. Some of the issues to be aware of are respondents' backgrounds; social environment; and technological environment;
2. Assess resources: The resources that were available to design the websurvey for this research are available online:
    a) http://sites.google.com/site was used to design the different paralingual webpage layouts.
    b) http://apps.facebook.com/my-surveys was used to post the survey questionnaire, please note that participants do not need to be logged in to Facebook to participate in the survey, please note that participants do not have to be logged into Facebook in order to participate in the survey;
3. Decide on methods: The first step in the methodology for conducting the websurvey was to use the websurvey on Facebook to post the questionnaire online. The second step is to invite participants using emails;
4. Write questionnaire: The questions were designed to obtain
    a) A general opinion of Arabic speakers online for different webpage layouts;
    b) Information about Arabic speakers' behaviour online; and
    c) Demographics of Arabic speakers who use the Internet;
5. Pilot test/Revise questionnaire: A pilot test was done to satisfy the objectives mentioned in Step 4;

6. Prepare sample: The sample design for this websurvey was already specified by Facebook; and
7. Train interviewers: This step was not applicable.

The rest of the steps will be discussed in the forthcoming subsections.

There are a number of criteria for a survey design to assure a high quality for it, such as:

> *"1. Supports multiple platforms and browsers.*
> *2. Controls for browser settings.*
> *3. Detects multiple submissions automatically.*
> *4. Presents questions in a logical or adaptive manner.*
> *5. Allows saving responses before completion.*
> *6. Collects open-ended or quantified-option responses.*
> *7. Uses paper questionnaire design principles.*
> *8. Prevents survey alteration.*
> *9. Provides for links.*
> *10. Does not require familiarity with survey presentation software"* (Andrews, Nonnecke, & Preece, 2003, p. 187).

The above quote by Andrews et al., (2003), describes some of the technical issues. It these, and the survey design described by Vate-U-Lan (2007) on page 102 Figure 31 that have been taken into account for this research.

> *"One way to increase validity of survey results is to ensure that participants in the survey process are the stakeholders who are affected by or involved in the processes under review in the survey. These persons will be the ones most knowledgeable about the outcomes and impacts of the process and have the most relevant input for improvement"* (The Pennsylvania State University, 2006, p. 2).

The above quote by Pennsylvania State University (2006) suggests that consulting participants upon the process would be useful. The questionnaire of the websurvey in this research allows respondents to make comments at the end of the survey.

4.6.1. The Web Design of Different Paralingual Layouts

This subsection describes the steps that were implemented to design the different paralingual layouts that will be used in Question 1 of the websurvey.

This service was available on Google applications and can be accessed through the following website:

http://sites.google.com/site/localizationforarabicspeakers

This website is available to respondents to enable them answer Question 1 in the survey questionnaire.

1. In order to be able to have different paralingual layouts that would enable respondents to choose their favoured option, it was essential to look for a tool that would ensure that the layouts will be available online. Therefore the first step was to think of a website that offers important information to migrants and that would be simple to redesign. Following the supervisors' advice, www.settelment.org.nz was the chosen example: the challenge was to present its content using paralingual design by displaying English and Arabic on one webpage. Figures 33-41 show all the web pages required to present the different paralingual layouts online - except the two welcome pages in English and Arabic languages, which are presented on separate pages respectively.

2. Figure 33 shows the main home page, which presents all the other webpages' links of different available paralingual layouts 1-6 on the left hand side.

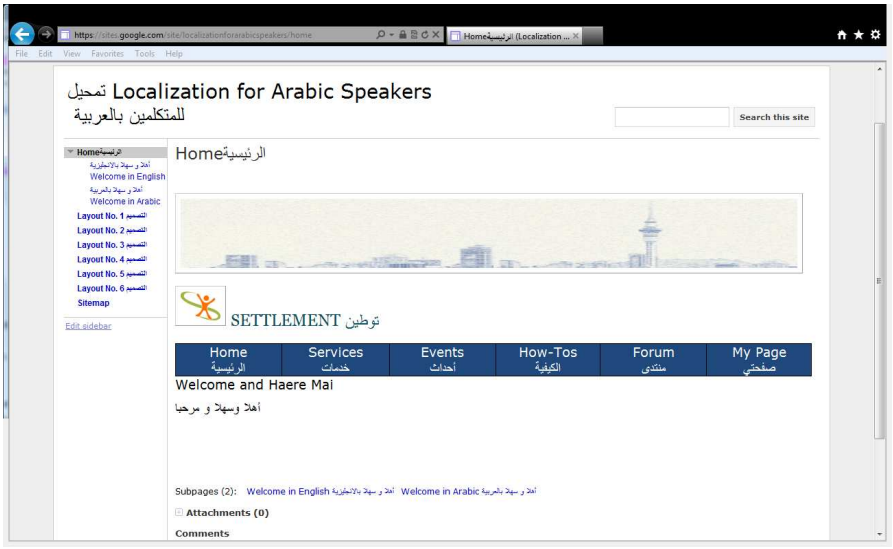


Figure 33 Home main page

3. Figure 34 shows the welcome webpage in the English language. This is an example of a multilingual website, where each language is presented on separate webpages.

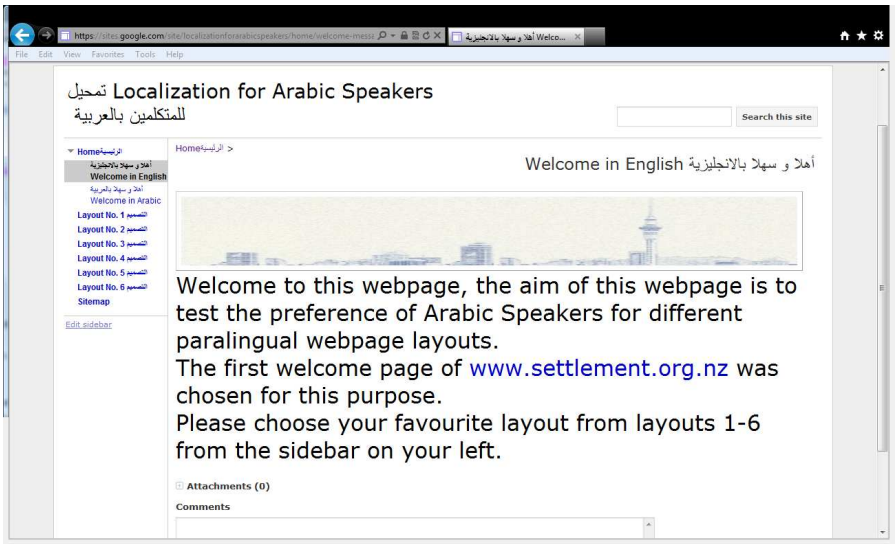


Figure 34 The welcome page in English

4. Figure 35 shows a welcome message in the Arabic language, which is a translation of Figure 34.

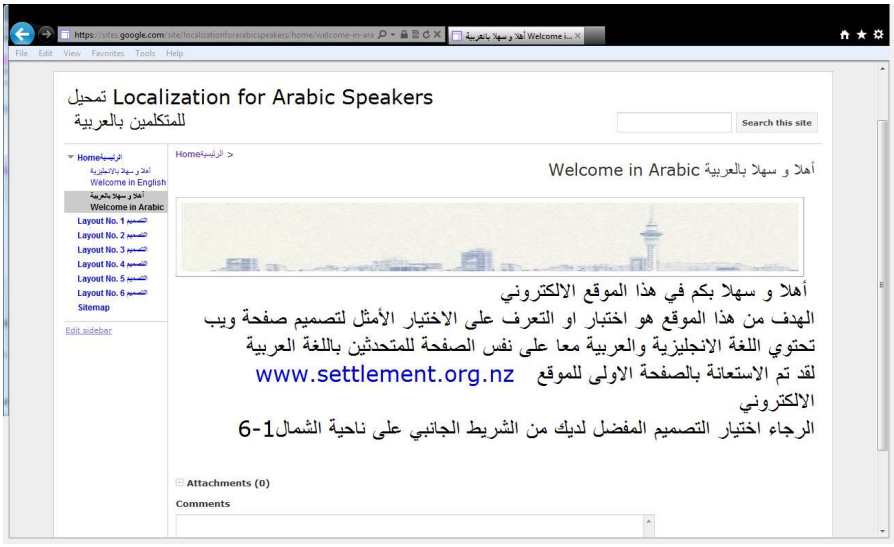


Figure 35 The welcome webpage in the Arabic language

5. Figure 36 shows paralingual Layout 1, line by line translation where the English language script is above, and the Arabic translation below.

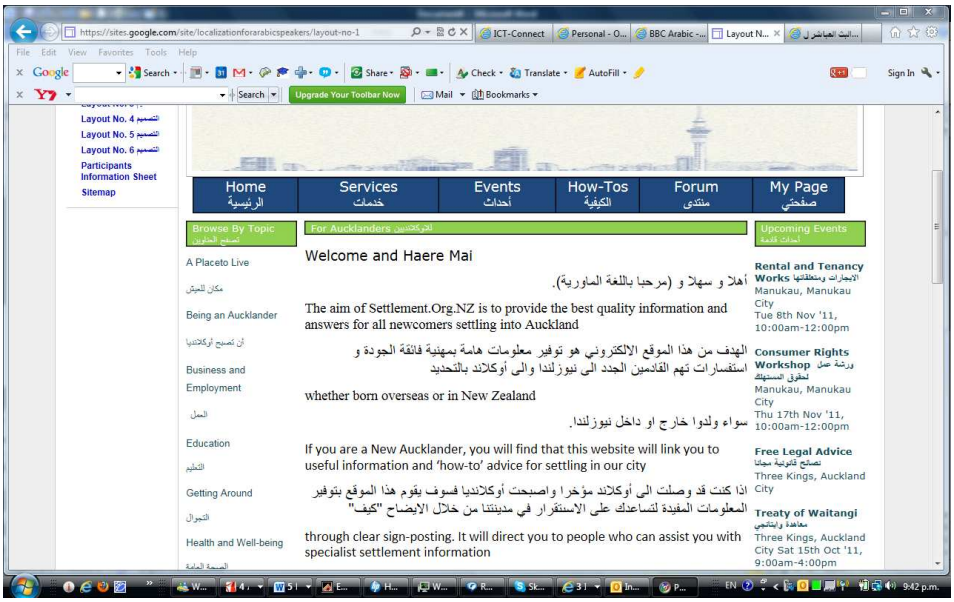


Figure 36 Webpage Layout 1

6. Figure 37 shows paralingual Layout 2 line by line, where the Arabic translation is above of the English script.

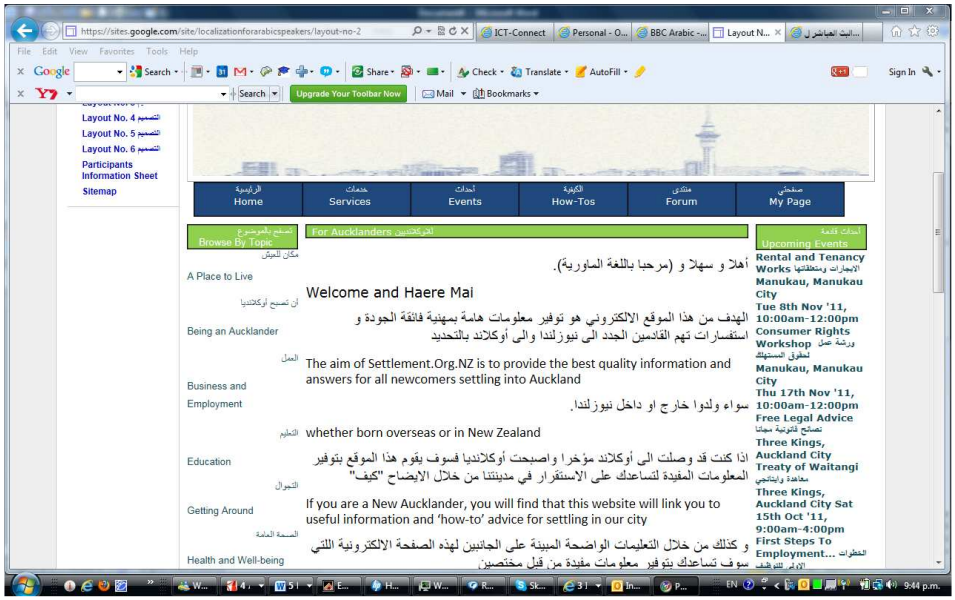


Figure 37 Webpage Layout 2

7. Figure 38 shows a paralingual Layout 3 (paragraph by paragraph English on top)paragraph by paragraph, where the English paragraph script is above, and the Arabic translated paragraph below the English script.

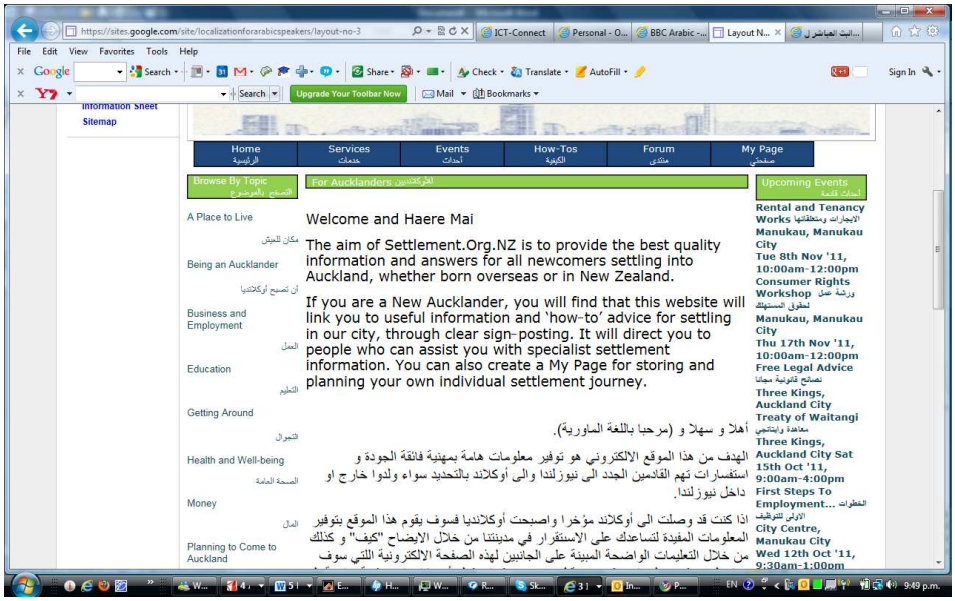


Figure 38 Webpage Layout 3

8. Figure 39 shows paralingual Layout 4 paragraph by paragraph, where this time the Arabic translated paragraph is above, and the English script paragraph is below.

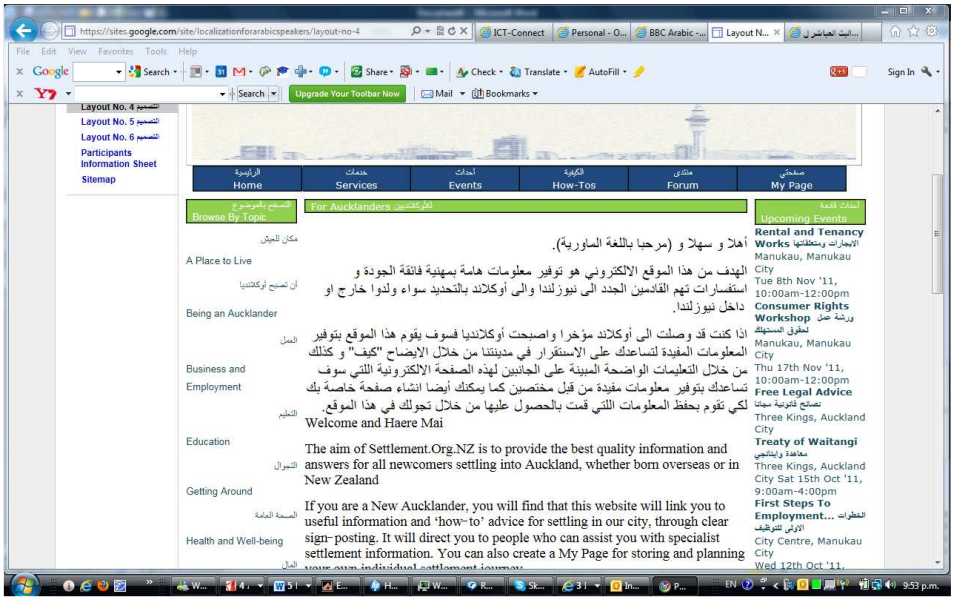


Figure 39 Webpage Layout 4

9. Figure 40 shows paralingual Layout 5 left-right and right-left layouts, where the English script is on the right hand side, and the Arabic translation is on the left hand side.

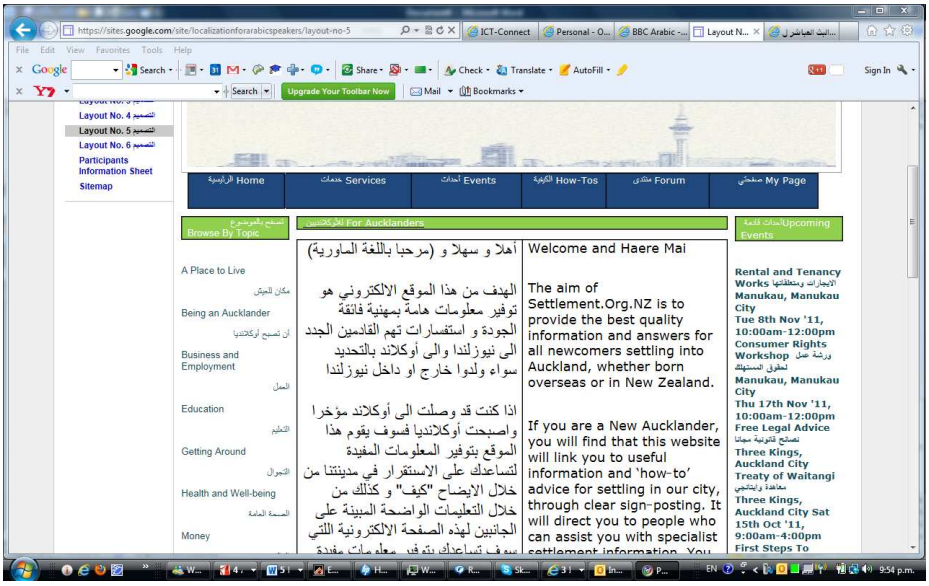


Figure 40 Webpage Layout 5

10. Figure 41 shows paralingual Layout 6 left-right and right-left layouts, where the English script is on the left, and the Arabic translation is on the right hand side.

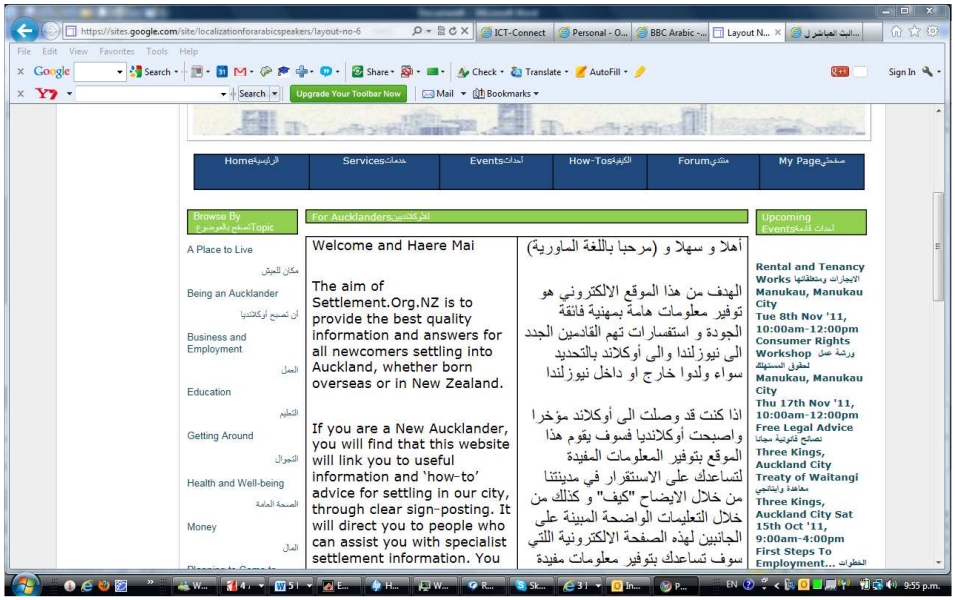


Figure 41 Webpage Layout 6

The above webpage layouts that are available at: http://sites.google.com/site/localizationforarabicspeakers is part of Question 1 of the web survey's questionnaire, which would enable the participants to choose their preference and write it down as their answer in Question 1.

The next section is a description of the websurvey questionnaire.

4.6.2. Web Survey Questionnaire

This subsection contains a description of the nineteen websurvey questions that designed to collect or obtain the required data:

1. A general opinion of the preferences of paralingual webpage layouts from Arabic speakers in New Zealand and overseas in Questions 1 to 4;
2. Information about Arabic speakers' demographics in Questions 5 to 10, and Questions 15 to 16;
3. Online behaviour of Arabic speakers who use the Internet in Questions 11 to 14, and Question 17; and
4. The respondents' consent for this research in Questions 18 to 19.

Figure 42 shows websurvey Question 1, which defines the preference of the respondent through providing different layouts that are available on the following URL address:

http://sites.google.com/site/localizationforarabicspeakers

Figure 42 Websurvey Question 1

Figure 43 shows websurvey Question 2, which determines the reason for making the preference choice in Question 1.

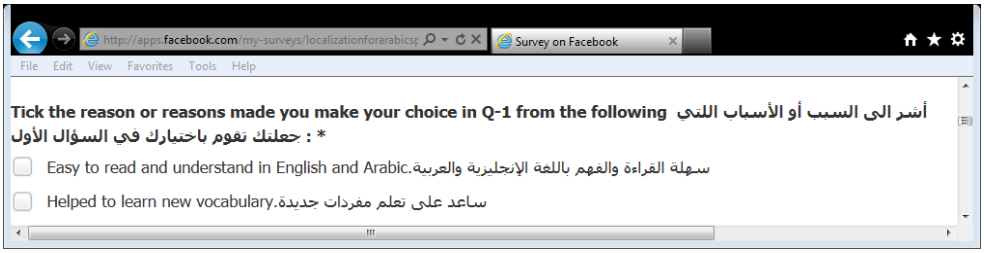


Figure 43 Websurvey Question 2

Figure 44 shows websurvey Question 3, which determines whether the paralingual layout is more appealing and would enhance the time spent using the Internet.

Figure 44 Websurvey Question 3

Figure 45 shows websurvey Question 4, which reveals the importance of using paralingual layouts on websites.

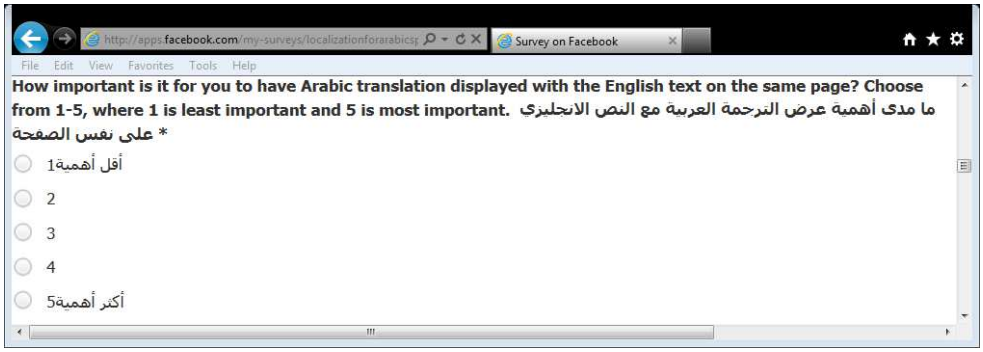


Figure 45 Websurvey Question 4

Figure 46 shows websurvey Question 5, which determines whether the respondent is overseas or lives in New Zealand. This can show the overseas interest in paralingual layouts.

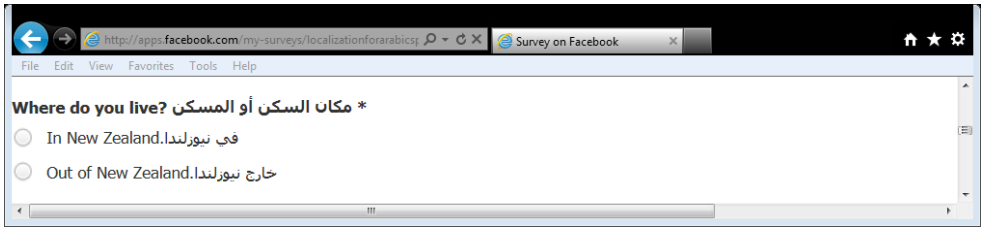


Figure 46 Websurvey Question 5

Figure 47 shows websurvey Question 6, which reveals whether the respondent is a new migrant or has spent some time in New Zealand.

Figure 47 Websurvey Question 6

Figure 48 shows websurvey Question 7, which gives the exact city of respondent. this will help locate migrants in New Zealand who might need the service.

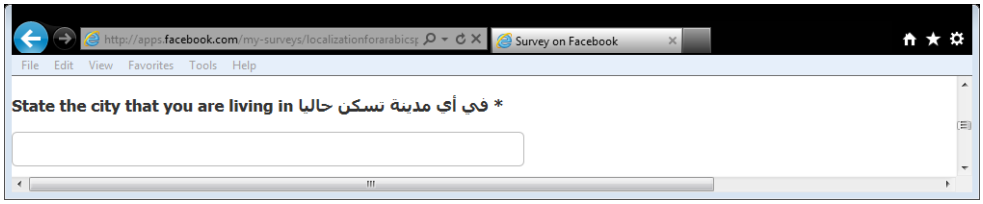


Figure 48 Websurvey Question 7

Figure 49 shows websurvey Question 8, which reveals age group of respondents.

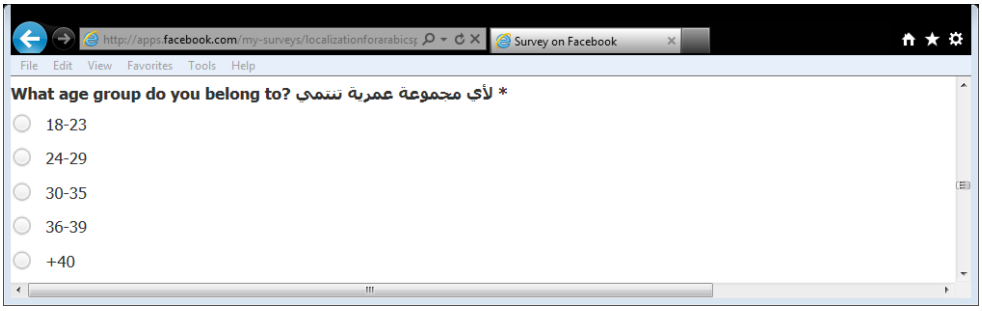


Figure 49 Websurvey Question 8

Figure 50 shows websurvey Question 9, which will help to assess the nationality of the majority of Arabic speaking migrants living in New Zealand.

Figure 50 Websurvey Question 9

Figure 51 shows websurvey Question 10, to discover the participants residence status.

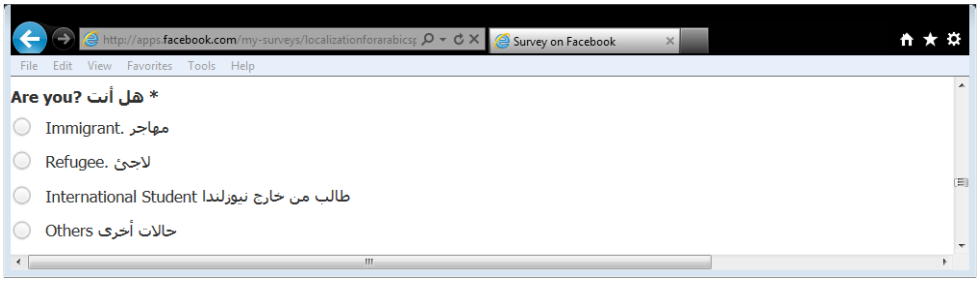


Figure 51 Websurvey Question 10

Figure 52 shows websurvey Question 11, to find the time respondents spend on the Internet.

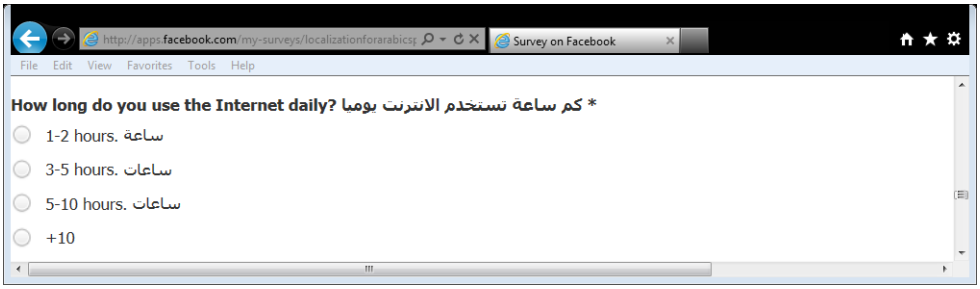


Figure 52 Websurvey Question 11

Figure 53 shows websurvey Question 12, which describes the type of Internet used by respondents.

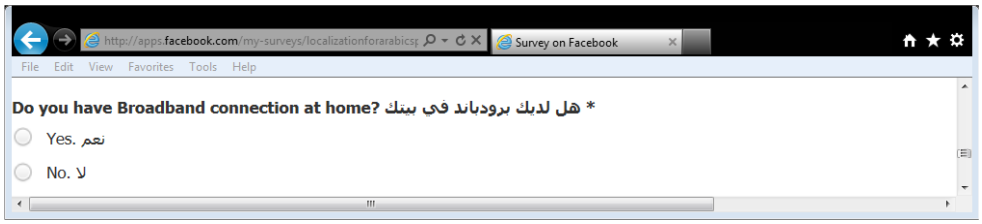


Figure 53 Websurvey Question 12

Figure 54 shows websurvey Question 13, to assess the importance of the use of Internet for respondents.

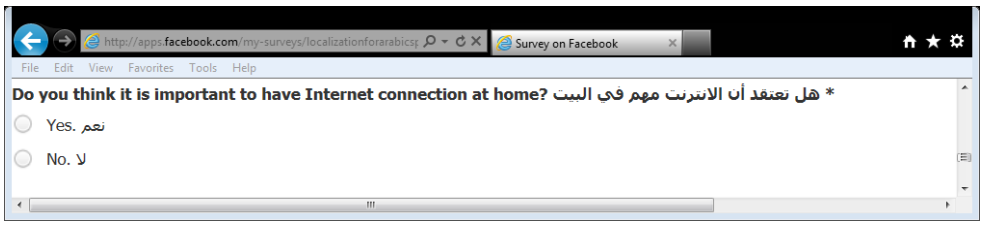


Figure 54 Websurvey Question 13

Figure-55 shows websurvey Question 14, which could reveal the effect of the respondent's economic situation.

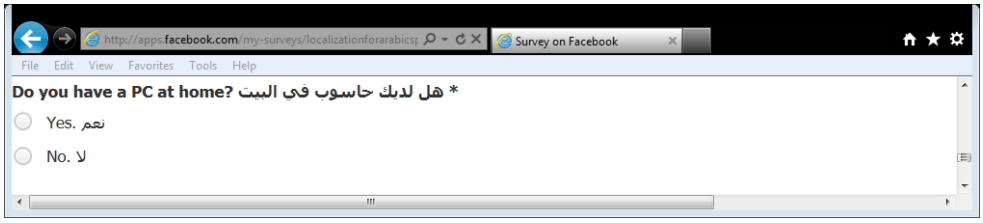


Figure 55 Websurvey Question 14

Figure 56 shows websurvey Question 15, which asks for the employment of respondents (and how that might affect the answers of previous questions).

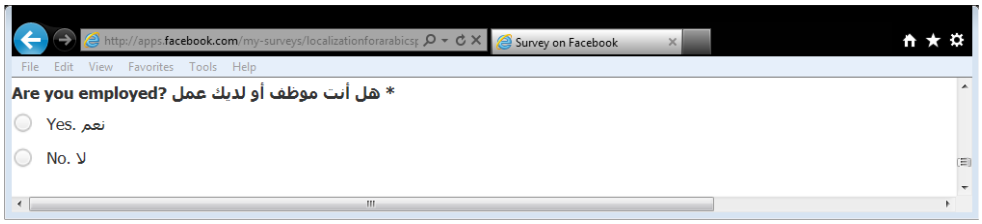


Figure 56 Websurvey Question 15

Figure 57 shows websurvey Question 16, which indicates gender of respondents, and whether women are using the Internet. And what is the ratio.

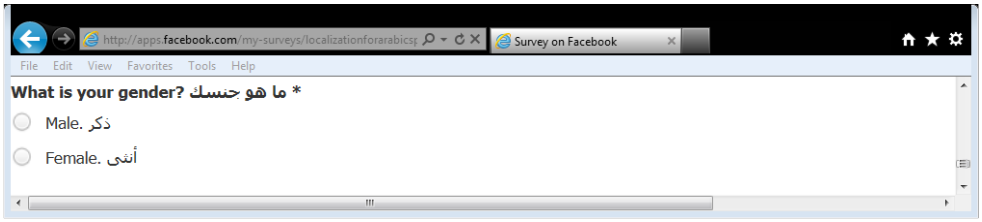


Figure 57 Websurvey Question 16

Figure 58 shows websurvey Question 17, which gives an indication of respondents' previous Internet experiences.

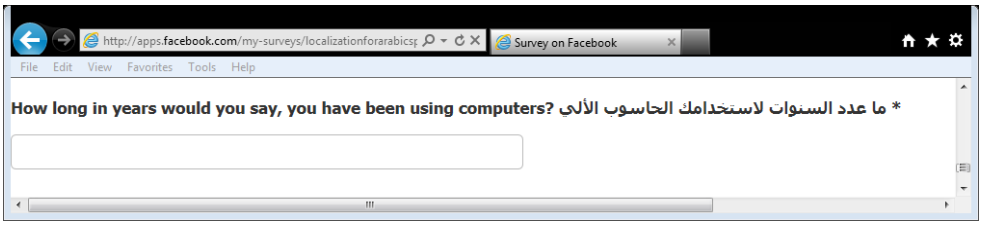


Figure 58 Websurvey Question 17

Figure 59 shows websurvey Question 18, which asks for respondents' feedback.

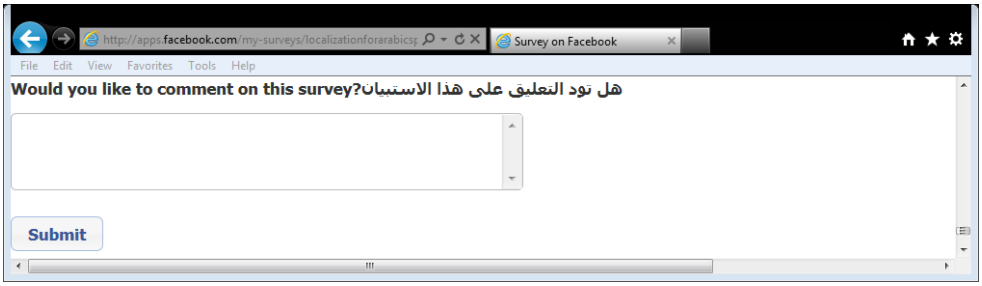


Figure 59 Websurvey Question 18

Figure 60 shows websurvey Question 19, which informs participants that the results of this research are subject to publication.

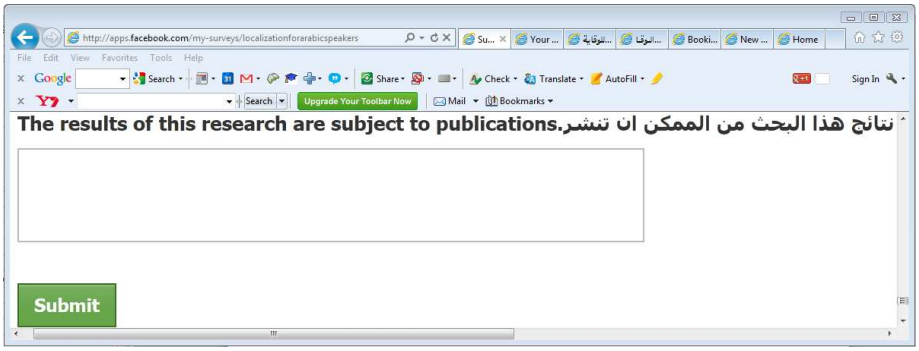


Figure 60 Websurvey Question 19

4.7. Results

This Section discloses all the results associated with the websurvey that were conducted to test Arabic speakers for different paralingual webpage layouts.

Before listing the results of each question of the websurvey it is vital to scrutinise the participants who participated; the methodologies used to approach the participants; and the response rate to this websurvey.

4.7.1. Participants, Methodologies, and the Response Rate

- How were participants convinced and reached?
- How long was the survey running for?
- How many responded?
- Issues?

There were a number of challenges that the process of conducting this websurvey encountered. Some of these challenges are listed below:

1. After the process of designing the websurvey sites as explained in Section 4.6, the ethics approval to conduct and start this websurvey took a very long time - awaiting a support letter from the Waikato Refugees Resource Centre be enclosed with the ethics application.
2. The process of contacting and approaching participants indirectly was through official personnel who are directly in contact with the Arabic speaking participants. This started in March 2012, four months after finishing the websurvey design process.
3. The international student advisor at The University of Waikato was one of the personnel who have direct contact with international students at the university. This advisor was very helpful, emailing the Arabic speaking students the websurvey link http://apps.facebook.com/my-surveys/localizationforarabicspeakers. Please note that participants do not need to be logged into Facebook in order to participate in the survey.
   Other personnel who had direct contact with Arabic speaking refugees was the coordinator of the Waikato Refugee Resource Centre http://www.wmrc.org.nz/, and the CEO of the Refugee Services http://www.refugeeservices.org.nz/contact_us, but they did not cooperate by promoting the online websurvey for their clients.
4. There was an expectation of slow response rate, but it is necessary to be careful how to approach NGOs' personnel who are in direct contact with the targeted participants, because the NGOs' personnel are always concerned to

avoid violating the participants' personal privacy and to respect their anonymity.

5. The websurvey was online for three months, and a total of twenty nine participants as having participated for this time.
6. One of the issues relevant to this websurvey was the uncertainty as to whether the vast number - refugees of around five thousand or more - that were reported in the literature, were reached through proper contact paths.
7. An alternative to the websurvey method was the option of using a paper survey to be handed to participants; face to face; but this option was ruled out, because of the other methods to be conducted in this research, such as the eye tracking experiment and interviews, as presented in Chapters 5 and 6 respectively.

4.7.2 Results of the Websurvey Questionnaire

Question 1:

Q 1. Please choose your preference layout from the following six figures:
○1 ○2 ○3 ○4 ○5 ○6

The six different paralingual webpages are presented in Appendix B.

Figure 42 contains instructions to direct participants to different paralingual webpage layouts available at: http://sites.google.com/site/localizationforarabicspeakers

Figure 61 shows the following results for Question 1:

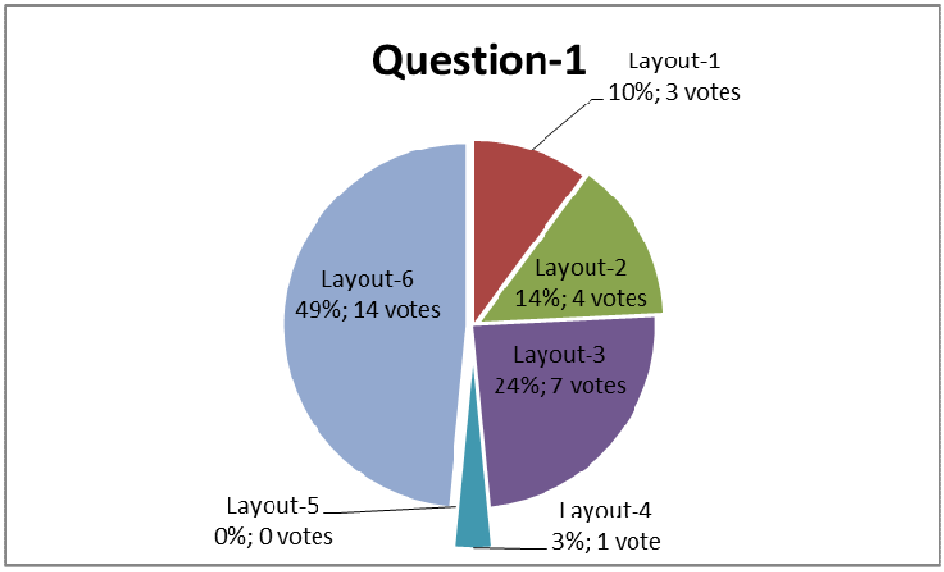


Figure 61 Question 1 results

- Ten per cent of the participants have chosen Layout 1, which is shown in Figure 36;
- Fourteen per cent of the participants have chosen Layout 2, which is shown in Figure 37;
- Twenty four per cent of the participants have chosen Layout 3, which is shown in Figure 38;
- Three per cent of the participants have chosen Layout 4, which is shown in Figure 39;
- No one has chosen Layout 5, which is shown in Figure 40; and
- Forty nine per cent of the participants have chosen Layout 6, which is shown in Figure 41.

The total of participants who answered this question was twenty nine.

Question 1 Results: The results of Question 1 show that the majority have preferred Layout 6. This layout displays the Arabic translation on the right hand side and the English text on the left hand side, which implies that the majority of the participants related to this layout, because that is how they normally read Arabic. The websurvey results also show is that Layout 5 did not make any sense to any of the participants.

Question 2:

Q 2 Tick the reason or reasons made you make your choice in Q 1:
☐ Easy to read and understand the English text and its Arabic translation.
☐ Helped me learn new vocabulary.

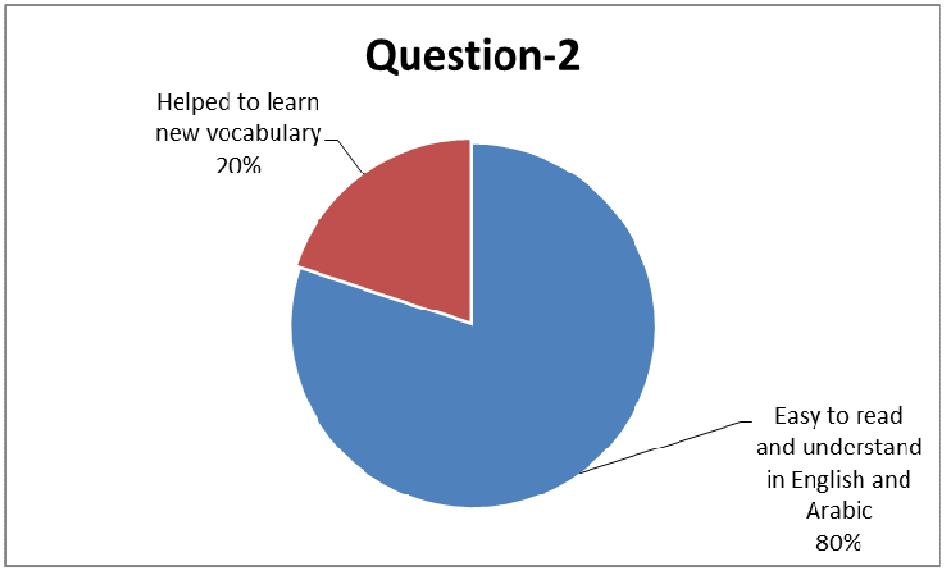


Figure 62 Question 2 results

Figure 62 shows that eighty per cent of the participants (23 participants) selected that the reason for their choice in Question 1 was that it was easy to read and understand in both the English and Arabic languages.

The majority of the participants in Question 1 have chosen layout six, is due to the fact that the Arabic language is written from right to left, therefore it would be easier and more logical to read in that design.

Twenty per cent (6 participants) have selected the reason for their choice in Question 1 was because it helped them to learn new vocabulary. This suggests too that using a paralingual webpage layout could be used as an educational tool, because it enables users to know the meanings of new and difficult words instantly, instead of having to go back to the dictionary and look for difficult words.

Please note that the actual number of votes for this question was not included within the chart in Figure 62, because some participants responded to *both* selections so the total number of votes was thirty five.

Question 2 Results: The result of Question 2 shows that the majority of the participants thought that the paralingual webpage layout that they had chosen in Question 1 was easy to read and understand in English and Arabic.

Question 3:

Q 3 Displaying English text with its Arabic translation of e-government websites will encourage me to look for information online more often:

○Yes ○No

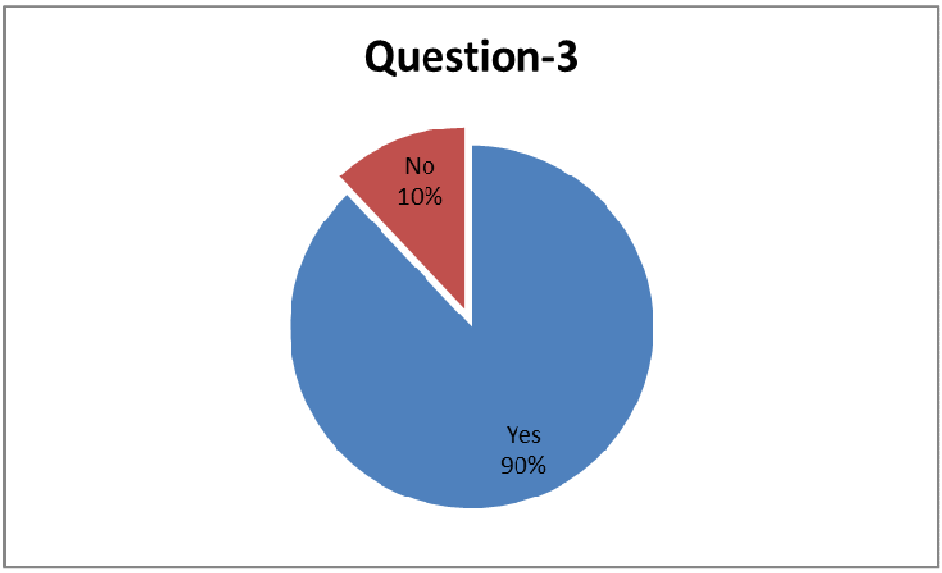


Figure 63 Question 3 results

Figure 63 shows the result for Question 3 was that ninety per cent thought that displaying the English text with its translation in the Arabic language of e-government websites would encourage them to look for information more often online, whereas only ten per cent thought otherwise. The total of participants who answered this question was twenty nine participants.

Question 3 Results: The result of Question 3 shows that a paralingual webpage layout would help users, or Arabic speakers in this situation, who have trouble looking for important and useful information online that is displayed in English only. And it also implies that they would be online more often, thus the benefit and the aim of e-government would reach a bigger sector of the population.

Question 4:

Q 4 How important is it for you to have Arabic translation displayed with the English text on the same page? Choose from 1-5, where 1 is least important and 5 is most important

○1 ○2 ○3 ○4 ○5

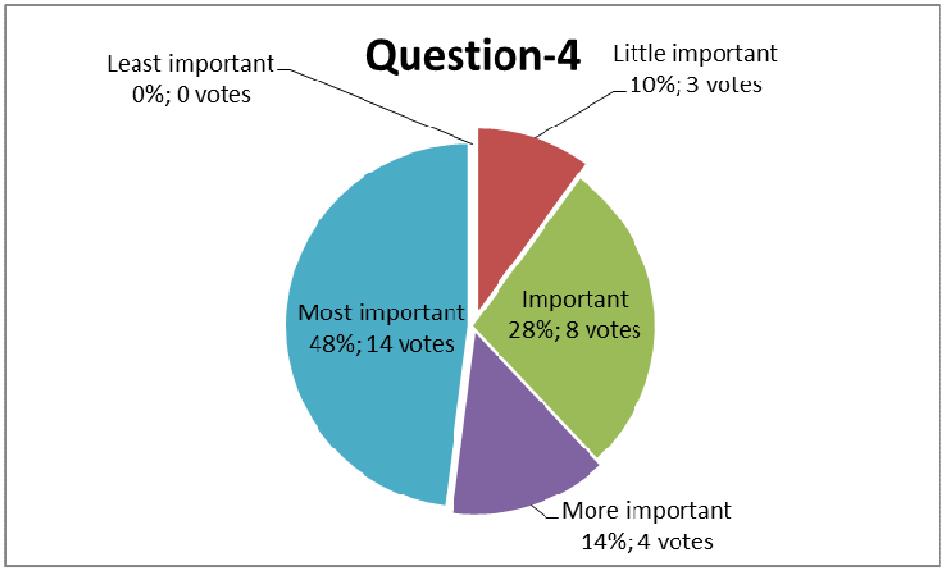


Figure 64 Question 4 results

The result of Question 4 as shown in Figure 64 shows a range of opinion among the participants, where forty-eight per cent thought that paralingual webpage layout was most important; fourteen per cent thought that it was more important; twenty eight per cent thought that it was important; ten per cent thought that paralingual webpage layout was at little importance; and significantly no one thought that it was least important (zero per cent). The total of participants who answered this question was twenty nine.

Question 4 Results: The result of Question 4 shows that forty-eight per cent thought that it is most important to have Arabic translation displayed with the English text on the same page (paralingual).

Question 5:

Q 5 Where do you live?

◯ In New Zealand ◯ Out of New Zealand

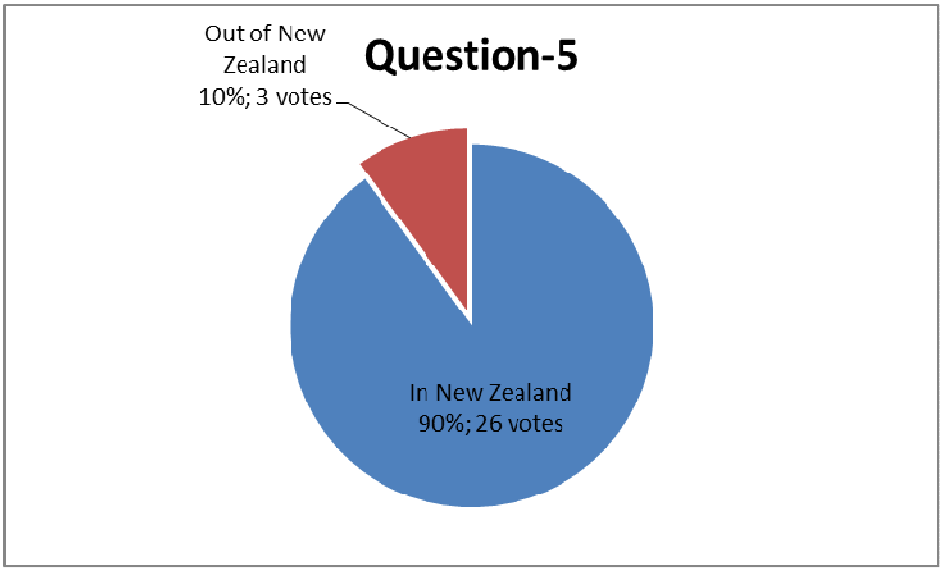


Figure 65 Question 5 results

The result for Question 5 as shown in Figure 65 shows that ninety per cent of the participants lived in New Zealand at the time of the websurvey; whereas ten per cent of the participants lived outside New Zealand at the time of the websurvey. The total of participants who answered this question were twenty nine.

Question 5 Results: These results show that Arabic speakers who are living outside New Zealand have also participated and showed an interest in this websurvey. It would be interesting to find out how many would use e-government websites to look for legislative rules and regulations in New Zealand for immigration purposes or even for tourism.

Question 6:

Q 6 How long have you lived in New Zealand?

○ 1-3 ○ 3-5 ○ 5-10 ○ 10 and up

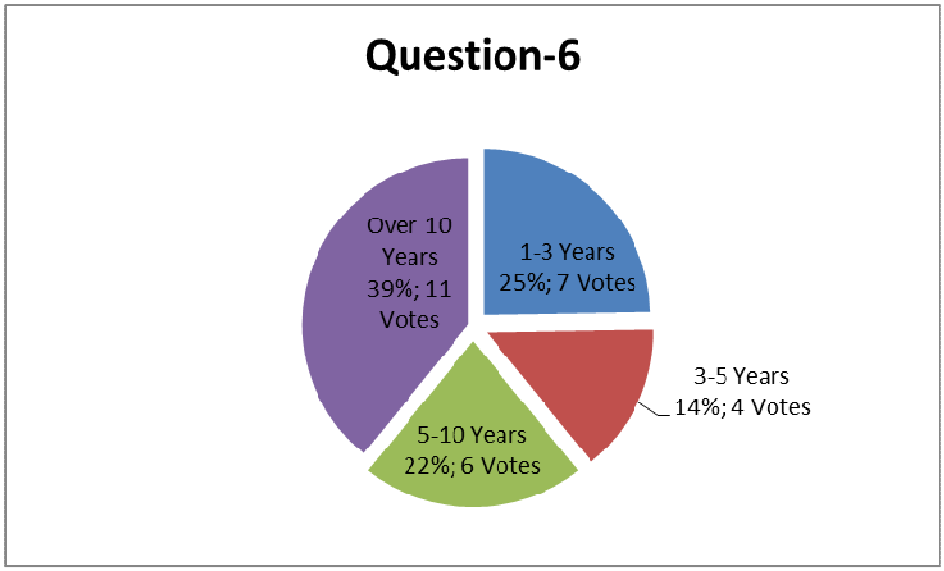


Figure 66 Question 6 results

Figure 66 gives the result for Question 6, showing the number of years each participant has lived in New Zealand. Sixty one per cent of the participants have lived in New Zealand more than five years; whereas only thirty nine per cent have lived here under five years in New Zealand. The total of participants who answered this question was twenty eight.

Question 6 Results: These results of Question 6 show that the majority of the participants have lived more than five years in New Zealand.

Question 7:

Q 7 State the city you live in?

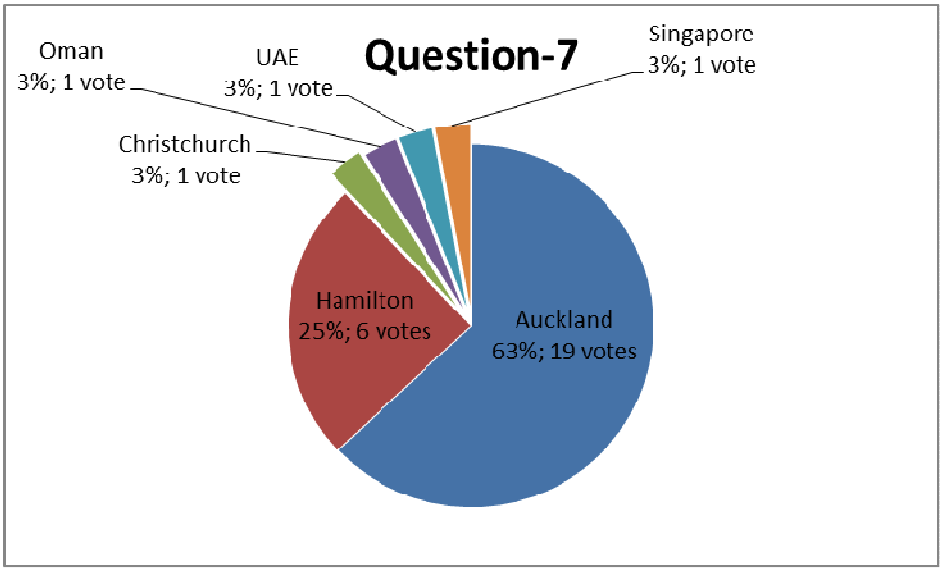


Figure 67 Question 7 results

The results for Question 7 are shown in Figure 67. The question was state the city you are living in. Sixty three per cent of the participants were living in Auckland; twenty five per cent were living in Hamilton; three per cent were living in Singapore; three per cent were living in the United Arab Emirates (UAE); three per cent were living in Oman; and three per cent were living in Christchurch. The total participants who answered this question was twenty nine.

Question 7 Results: These results of Question 7 show that the majority of the participants are living in New Zealand, which is the result of adding together the percentages of participants living in Auckland, Hamilton and Wellington.

Question 8:

Q 8 What age group would you say you belong?

○ Under 18 ○ 18-24 ○ 25-40 ○ 40 and up

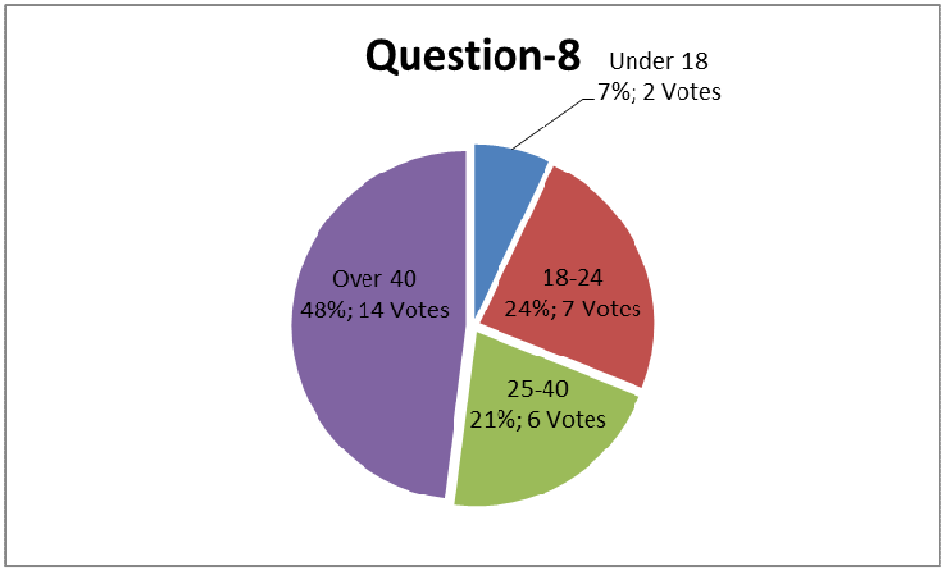


Figure 68 Question 8 results

The result shown in Figure 68 for Question 8, which was what age group do you belong to: Fifty two per cent of the participants were under forty, forty eight per cent were over forty years old. The total of participants who answered this question was twenty nine.

Question 8 Results: The results of Question 8 show that the majority of the participants were forty years old and under; hence those are the people who are using technology more.

Question 9:

Q 9 What is your country of origin?

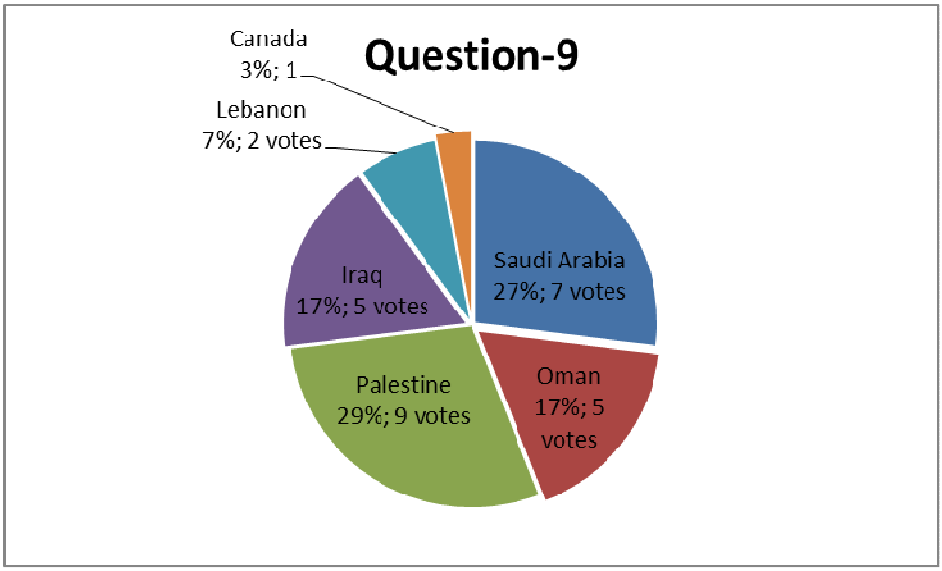


Figure 69 Question 9 results

These are the results of Question 9 as shown in Figure 69, the question being what is your country of origin? Twenty nine per cent of the participants were from Palestine; twenty seven per cent were from Saudi Arabia; seventeen per cent were from Oman; seventeen per cent were from Iraq; seven per cent were from Lebanon; and three per cent were from Canada. The number of participants who responded to this question was twenty nine.

Question 9 Results: The results of Question 9 imply that participants from various different countries took part in the paralingual webpage layout's questionnaire, hence that the literature in Chapter 2 showed that Arabic speakers came from various countries.

Question 10:

Q 10 Are you an Immigrant or Refugee?

○ Immigrant ○ Refugee ○ International Student ○ Others

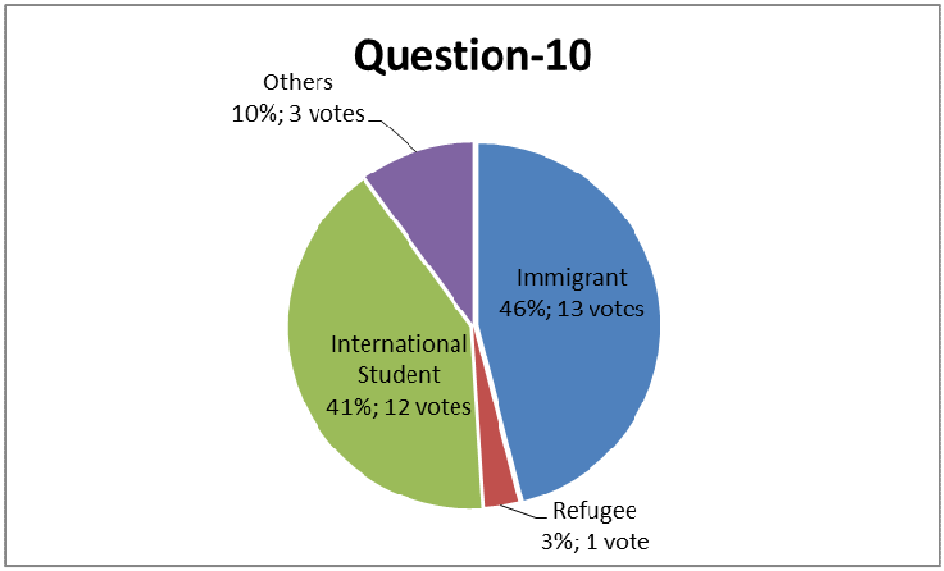


Figure 70 Question 10 results

These are the results as shown in Figure 70. Forty six per cent of the participants were immigrants; forty one per cent were international students; ten per cent were from other backgrounds such as international employees, or tourists; and three per cent were refugees. The total number of participants who answered this question was twenty nine.

The criteria for the settlement status of the Arabic speaking participants will be analysed further in Section 4.8, in order to understand the reasons behind their preference for a certain paralingual webpage layout, and to understand how to enhance their interest to engage in e-government websites and take advantage of the various services available for them.

Question 10 Results: The results of Question 10 show that the majority of the participants were immigrants and international students. The results also show that the websurvey has not reached a targeted sector aimed for in this study, namely refugees. Another interpretation is that some of the participants might have called themselves immigrants even though they are refugees. The incentive behind that is unknown.

Or this result could imply that a lot of refugees and newcomers did not have access to the Internet, therefore they could not participate in this websurvey. Therefore the next phase should concentrate on refugees more than others.

One of the advantages of having used more than one method - or the triangulation method - is that other methods such as the qualitative method will ensure the participation of the targeted people under this study, meaning that more refugees will be chosen when possible for the eye tracking experiment.

Question 11:

Q 11 How long do use the Internet daily?

○ 1-2 ○ 3-5 ○ 5-10 ○ more than 10

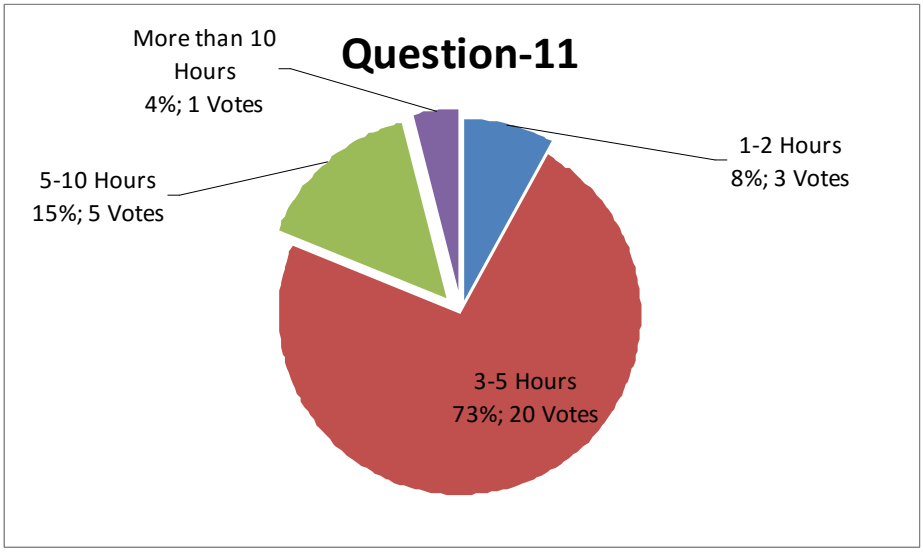


Figure 71 Question 11 results

The results as shown in Figure 71 of Question 11. Eighty per cent of the participants used the Internet five hours or less daily; and only twenty per cent of the participants used the Internet for more than five hours daily. The total number of participants who answered this question was twenty nine.

Question 11 Results: The results of Question 11 show that the majority of the participants spent three to five hours daily, which indicates that the Internet is used moderately and reasonably among Arabic speakers.

Question 12:

Q 12 Do you have Broadband connection at home?

○ Yes ○ No

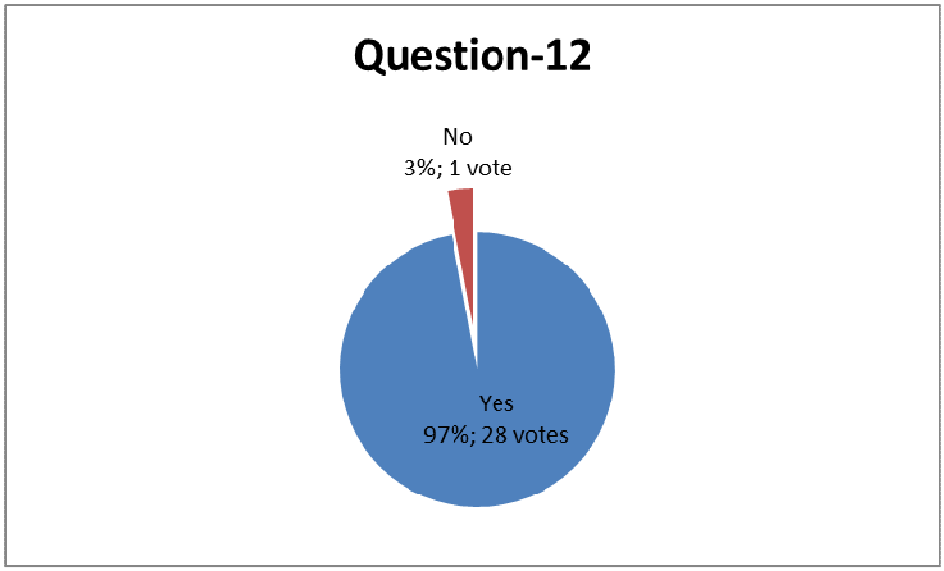


Figure 72 Question 12 results

The results shown in Figure 72. Ninety seven per cent of the participants answered yes to this question; and three per cent of the participants do not have broadband at home. The total number of participants who answered this question was twenty nine.

Question 12 Results: The results of Question 12 show that the majority of the participants have broadband connection at home, which means that they can get access to important information "24-7" at any time at their comfort. The results also imply that the majority can afford the cost of broadband connection.

Question 13:

Q 13 Do think is it important to have Internet connection at home?

○ Yes ○ No

All twenty nine participants answered yes to this question; therefore there is no need to include a chart to explain and discuss the results.

Question 13 Results: The results of Question 13 shows clearly that all participants thought that it is important to have Internet connection at home. This indicates that there is awareness of the importance of the Internet among Arabic speakers.

Question 14:

Q 14 Do you have a PC at home?

○ Yes ○ No

All twenty nine participants answered yes to this question, that they all have a PC at home.

Question 14 Results: The results imply that all of the participants can afford to have a PC at home to use the Internet.

Question 15:

Q 15 Are you Employed?

○ Yes ○ No

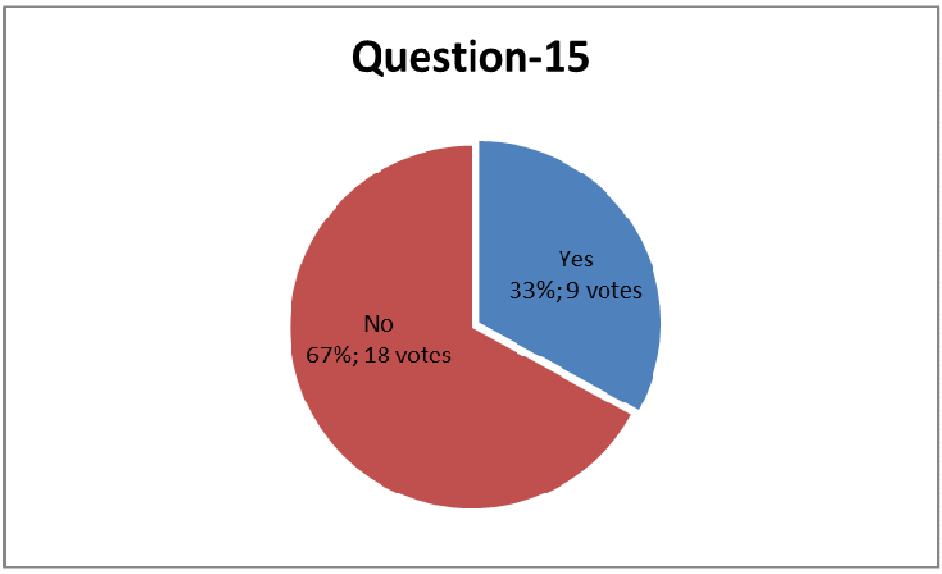


Figure 73 Question 15 results

The results of question fifteen as shown in Figure 73, are that sixty seven per cent of the participants were not employed; and only thirty three per cent of the participants were employed. The total number of participants who answered this question was twenty seven.

Question 15 Results: The results of Question 15 show that the majority of the participants were either international students or unemployed.

Question 16:

Q 16 What is your gender?

○ Male ○ Female

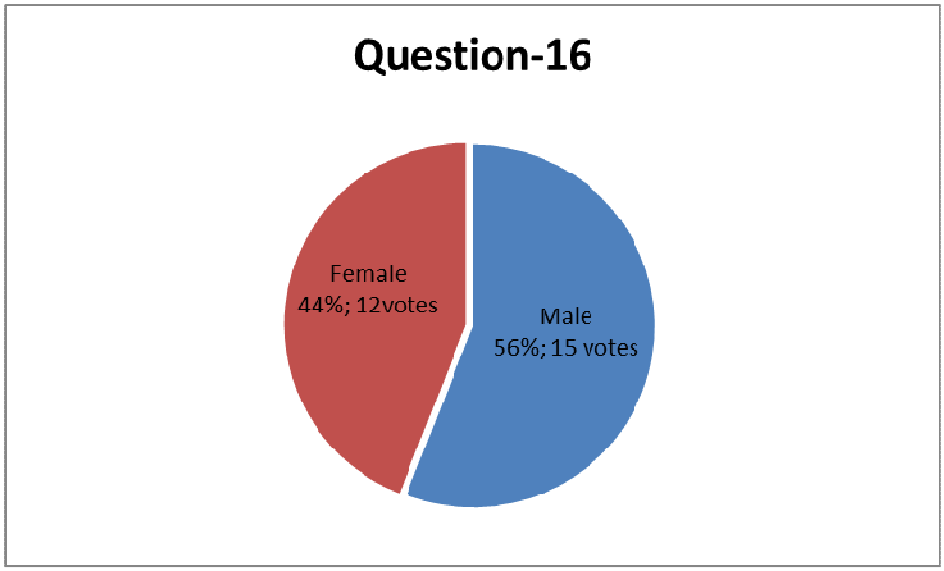


Figure 74 Question 16 results

The result of question sixteen as shown in Figure 74, is that fifty six per cent were males; and forty four per cent of the participants were females. The total of participants who answered this question was twenty seven.

The criteria of men's and women's results are investigated further in Section 4.7.3. It will be interesting to analyse Arabic speaking women and men preferences for different paralingual webpage layouts, and how their interests differ.

Question 16 Results: The results of Question 16 show that although the majority of the participants were males, but that males and females have very similar interests in using the Internet to get information.

Question 17:

Q 17 How long in years would you say, you have been using computers?

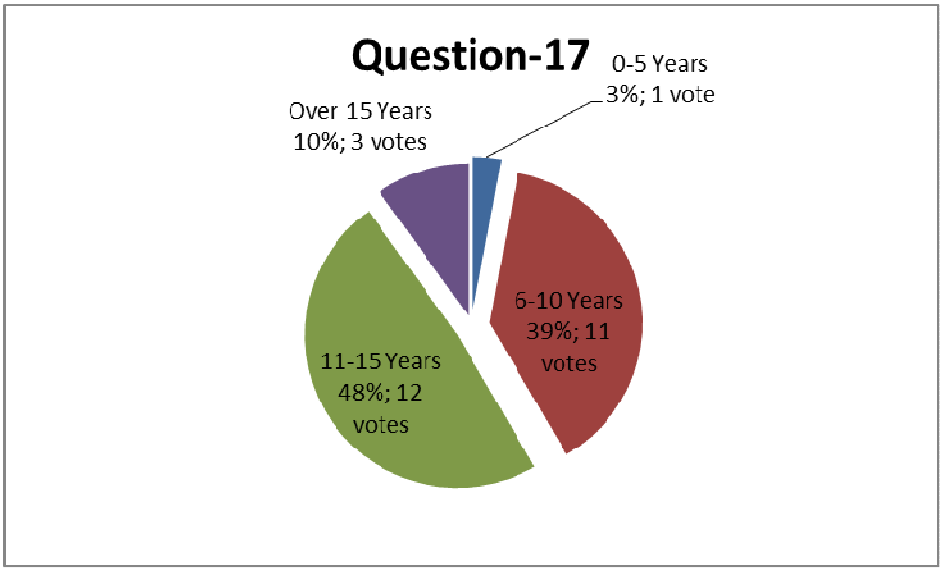


Figure 75 Question 17 results

The results shown in Figure 75 are: three per cent of the participants have used computers for five years or less; thirty nine per cent have used computers for six to ten years; forty eight per cent have used computers for eleven to fifteen years; and ten per cent have used computers for more than fifteen years. The total of participants who answered this question was twenty seven.

Question 17 Results: The results of Question 17 show that the participants have used computers between five to twenty years, which indicates that some of the participants have used computers even before they have arrived to New Zealand.

Question 18:

Q 18 Would you like to comment on this survey?

Table 12 Question 18 results

Positive Feedback	Negative Feedback
I think this survey is very good and useful for many Arabic peoples to know more information about NZ. ..... Best regard	
It is great to have such webpage. I hope it will exist within this year. Thanks,	
Thank you for this survey..	
تمني لك التوفيق والنجاح if the website contain more information especially the important one like the immigration and	

how to connect in emergency and the law of the country I wish you success, and prosperity (Researcher's translation to comments in Arabic)	
	It is better to do the page only in English with a link for a separate page in Arabic
The survey is honest and reliable.	as i'm a computer science student, i found that none of the provided layouts would be really good for this kind of website i'm really happy to participate in your survey and i wish you all the best kind regards
All good.	
اتمني لك التفيق وتحقيق النتاج الطيبه I wish you success and obtain good results (Researcher's translation to Arabic comments)	
good lauck with this survey, may Gad will help you.	
It a good idea for displays English text with it is translation in Arabic in e-government websites.So people will try to look for further information.	
it's an easy one ..to the point questions	
لم يتم السؤال عن المستوى التعليمي، أم أنه غير مهم؟ وكذلك نوعية العمل ، هل له ارتباط بالكمبيوتر أم لا شكراً There were no questions included in the questionnaire, in regards to participants' educational background, or is it irrelevant? Also the participants' occupation, does it have to be relevant to IT, than you (Researcher's translation to comments in Arabic)	
Please note that all these comments are actual word for word of what the participants wrote	

Thirty eight per cent of the participants commented positively; seven per cent of the participants commented negatively; and fifty five per cent of the participants decided not to give any comments. The comments are recorded in Table 12.

Question 18 Results The results of Question 18 show that while the majority of the participants preferred not to comment on the websurvey, the majority of the participants who did comment gave positive comment.

Question 19:

Q 19 The results of this research are subject to publications

All of the participants did not object to such a thing.

Question 19 Results: The results of Question 19 are clearly that all participants have no objection to the results of this research being published; this could be considered as a consent from participants, which satisfies ethics requirements.

4.7.3. Correlating and Interrelating the Websurvey Data Results

This section contains results for different criteria that will be useful for the analysis.

The first criterion is based on the settlement background of the participants, which is clarified by the answer given to Question 10. This specification results in producing two tables: international students; and immigrants, refugees and others, as shown in Section 4.7.3.1 and in Section 4.7.3.2 respectively.

The results show that forty six per cent of the participants were immigrants; forty six per cent of the participants were international students; three per cent were refugees; and eight per cent of the participants were others such as political asylum seekers, or tourists, etc.

The second criterion is based on the gender of the participants, which can be obtained by the results given in Question 16. This specification resulted in producing two tables: women, and men as shown in Section 4.7.3.3 and Section 4.7.3.4 respectively.

A full websurvey questionnaire is shown in Appendix C.

Table 13 below explains the symbols and abbreviations that are used in the results tables 14, 15, 16, and 17.

Based on the results collected in Section 4.7.2 three tables have been created and contrived. Table 14 is an explanation of the international students' responses of the participants to the websurvey questionnaire. Table 15 is an explanation of the

immigrants', refugees' and others' responses to the websurvey questionnaire. Table 16 is an explanation of results based on women participants. Table 17 is an explanation of results based on men participants.

Table 13 The Signs and abbreviations used in tables

☺	Positive comments
☻	Negative comments
.	Agree
1,2,3,4,5 and 6	Different paralingual webpage layouts
Auk	Auckland
Ham	Hamilton
Chr	Christchurch
SA	Kingdom of Saudi Arabia
Om	Sultanate of Oman
Pal	Palestine
Can	Canada
Fe	Female
Ma	Male
Q #	Questions 1-19 except for Question 10
IS	Immigration Status
R	Refugee
I	Immigrant
O	Migrants classified as Others

4.7.3.1. Implications Drawn of International Students' Results

Table 15 consists of eighteen columns using responses of international students to the websurvey questionnaire. Note that Question 10 is based on the participants' immigration status as a unit of analysis; therefore is not included in the table, because it was predetermined already.

Table 14 The results of International students

No	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19
1	3	1	1	5	1	1	Auk	2	SA	2	1	1	1	2	Fe	<8y	☺	✓
2	3	1	1	5	1	1	Ham	3	SA	2	1	1	1	2	Ma	12y	☺	✓
3	3	1&2	1	5	1	3	Auk	2	Om	3	1	1	1	2	Fe	6y	☺	✓
4	6	1	2	3	1	2	Ham	3	SA	2	1	1	1	2	Ma	14y	☻	-
5	1	1	1	4	1	1	Auk	2	Om	2	1	1	1	2	Ma	10y	-	-
6	3	1	1	2	1	3	Chr	2	Om	2	1	1	1	2	Ma	10y	-	-
7	3	1	1	3	1	1	Ham	3	SA	2	2	1	1	2	Ma	8y	-	-
8	4	1	1	5	1	2	Ham	3	SA	2	1	1	1	2	Ma	12y	☺	✓
9	6	1&2	2	2	1	2	Ham	3	SA	3	1	1	1	2	Ma	12y	☺	-
10	6	1	1	3	1	1	Ha	2	O	2	1	1	1	2	Ma	13y	-	-

							m		m									
11	6	1	1	5	1	2	Ham	3	SA	3	1	1	1	2	Ma	14y	☺	✓
12	6	1&2	1	5	1	1	Auk	1	Pal	2	1	1	1	2	Ma	7y	-	-

Implications of the international students' results are presented in Appendix D

4.7.3.2. Implications Drawn of Immigrants' Refugees' and Others' Results

Due to incomplete distinguishing between immigrant, refugee and others statuses, it is better and more logical to group them together, because they are similar and it will make the analysis easier.

The creation of tables is very useful for organizing and analyzing, and in drawing or correlating different relationships, such as the percentage of participants who are living in Auckland and have a job, etc.

Table 15 The results of Immigrants, refugees and others

No	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	IS
1	6	1	1	5	1	4	Auk	4	Pal	1	1	1	1	2	Ma	16y	-	-	I
2	6	1	2	3	1	4	Auk	1	Pal	2	1	1	1	2	Fe	10y	-	-	I
3	6	1	1	2	1	4	Auk	4	Pal	4	1	1	1	-	-	-	-	-	I
4	6	1	2	5	1	4	Auk	4	Pal	2	1	1	1	-	-	-	-	-	I
5	2	1	1	5	1	4	Auk	4	Irq	3	1	1	1	1	Fe	9y	☺	✓	I
6	6	1	1	5	2	1	UAE	4	Pal	2	1	1	1	1	Fe	16y	☺	✓	I
7	6	1&2	1	5	1	4	Auk	4	Pal	2	1	1	1	2	Ma	5y	-	✓	I
8	3	1	1	4	1	4	Auk	4	Leb	2	1	1	1	1	Fe	15y	-	-	I
9	1	1	1	3	1	4	Auk	4	Irq	2	1	1	1	2	Fe	10y	-	-	I
10	6	1	1	4	1	4	Auki	4	Leb	2	1	1	1	1	Fe	13y	-	✓	I
11	3	1&2	1	3	1	3	Auk	4	Irq	1	1	1	1	1	Fe	15y	☺	-	I
12	2	1	1	5	1	4	Auk	4	Egp	1	1	1	1	1	Fe	10y	-	✓	I
13	6	1	1	5	1	4	Auk	2	Pal	2	1	1	1	1	Ma	10y	-	-	I
14	6	1&2	1	5	1	3	Auk	4	Irq	3	1	1	1	2	Fe	14y	☺	-	R
15	2	1	1	3	2	3	Om	2	Om	2	1	1	1	1	Ma	15y	☺	✓	O
16	2	1	2	3	2	1	Sing	4	Can	2	1	1	1	2	Fe	20y	-	-	O
17	1	1	1	4	1	3	Auk	4	Irq	2	1	1	1	1	Ma	12y	☺	✓	O

Table 15 consists of nineteen columns used to represent immigrants, refugees, and others responses to the websurvey questionnaire. Note that question ten is based on the participants' immigration status as a unit of analysis; therefore it was not taken into account, because it was already predetermined.

The complete results regarding the Implications drawn of Immigrants' Refugees', and Others' are presented in Appendix E.

4.7.3.3 Implications Drawn of Women's Results

The first step in this Section is to create a table in order to select and summarize the results required such as women's results from the results that were obtained and collected in Section 4.7.

Table 16 The Results of Women Participants

No	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q17	Q18	Q19
1	2	1	1	5	1	4	Auk	4	Egy	1	1	1	1	1	1	10y	-	✓
2	6	1&2	1	5	1	3	Auk	4	Irq	2	3	1	1	1	2	14y	☺	-
3	3	1	1	5	1	1	Auk	2	Sa	3	2	1	1	1	2	8y	☺	-
4	6	1	1	4	1	4	Auk	4	Leb	1	2	1	1	1	1	13	-	✓
5	3	1&2	1	3	1	3	Auk	4	Irq	1	1	1	1	1	1	15	☺	-
6	3	1&2	1	5	1	3	Auk	2	Om	3	3	1	1	1	2	6y	☺	✓
7	2	1	1	5	1	4	Auk	4	Irq	1	3	1	1	1	1	9y	☺	✓
8	6	1	1	5	2	-	UAE	4	Pal	1	2	1	1	1	1	16	☺	✓
9	3	1	1	4	1	4	Auk	4	Leb	1	2	1	1	1	1	15y	-	-
10	2	1	1	3	2	1	Sig	4	Can	4	2	1	1	1	2	20y	-	-
11	1	1	1	3	1	4	Auk	4	Irq	1	2	1	1	1	2	10y	-	-
12	6	1	2	3	1	4	Auk	1	Pal	1	2	1	1	1	2	10y	-	-

Table 16 consists of eighteen columns, where each cell is used to record women's responses to the web survey's questionnaire. Note that Question 16 was defining the participants' gender as a unit of analysis, so is already predetermined.

The results of women participants are presented in charts to demonstrate and explain the different relationships with regard to Arabic speaking women who participated in the websurvey, the complete outcome is presented in Appendix F.

4.7.3.4. Implications Drawn of Men's Results

As in the previous section, here will be organised as first, the 15 men are separated in Table 17, second, their results are summarised in the charts. Question 16 has been omitted (as it was for the women's table above). The complete outcome results are presented in Appendix G.

Table 17 The Results of Men Participants

No	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q17	Q18	Q19
1	1	1	1	4	1	3	Auk	4	Irq	4	2	1	1	1	1	12y	☺	✓
2	6	1	1	5	1	4	Auk	2	Pal	1	2	1	1	1	1	10	-	-
3	3	1	1	5	1	1	Ham	3	Sa	3	2	1	1	1	2	12y	☺	-
4	6	1	2	3	1	2	Ham	3	Sa	3	2	1	1	1	2	14y	☻	-
5	2	1	1	3	2	3	Om	2	Om	4	2	1	1	1	1	15y	☺	✓
6	1	1	1	4	1	1	Auk	2	Om	3	2	1	1	1	2	10y	-	-
7	3	1	1	2	1	3	Ch	2	Om	3	2	1	1	1	2	10y	-	-
8	3	1	1	3	1	1	Ham	3	Sa	3	2	2	1	1	2	8y	-	-
9	4	1	1	5	1	2	Ham	3	Sa	3	2	1	1	1	2	12y	☺	✓
10	6	1&2	2	2	1	2	Ham	3	Sa	3	3	1	1	1	2	12y	☺	-
11	6	1	1	3	1	1	Ham	2	Om	3	2	1	1	1	2	13y	-	-
12	6	1	1	5	1	2	Ham	3	Sa	3	4	1	1	1	2	14y	☺	✓
13	6	1&2	1	5	1	4	Auk	4	Pal	1	2	1	1	1	2	5y	-	✓

14	6	1	1	5	1	4	Auk	4	Pal	1	1	1	1	1	2	16y	-	-
15	6	1&2	1	5	1	1	Auk	1	Pal	3	2	1	1	1	2	7y	-	-

4.8. Data Analysis and Findings of the Websurvey

This section will study detailed correlated and interrelated answers and results and analyse them according to the participants' immigration background status, classifying the participants into four main categories: refugees, immigrants, international students; and others.

The collected data will be analysed independently and then there will be summations of the data analysis, and a resulting outcome of these summations will be presented in Chapter-7.

Now that these results have been collected, they could be used to correlate and interrelate to give more useful meaningful indications. For example, what did the twelve per cent of the participants who live outside New Zealand think of the usefulness of the paralingual webpage layout when looking for information online?

It is essential to keep in mind that the main objective of this research is Arabic speakers' preference for different paralingual webpage layouts. It is also important to determine on what basis or backgrounds did the majority of participants made their decisions.

> *In surveys that involve some sort of non-binary scale (such as a Likert, Likert-type, or ranking scale), comparisons are usually explicit. When researchers choose to use a scale of some sort, they imply that the construct or behaviour of interest is (a) something that can be measured, (b) that differences in the construct are important, and (c) that the possible responses on the scale represent real differences in the construct* (Molloy, 2005, p. 122).

An explanation of the Likert and Likert-type is given in the following quote: *"Likert in 1932 proposed a summated scale for the assessment of survey respondent's attitudes. Individual items in Likert's sample scale had five response alternatives: strongly approve, approve, undecided, disapprove, and strongly disapprove"* (Clason & Dormody, 1994, p. 31).

The results that have been collected from this websurvey were random samples that could be generalized to a large population.

> *Statistics is just another form of counting. However, statistical procedures often require assumptions about the probability of obtaining responses which can only be satisfied when using random samples, typically through the survey method. Where we have satisfied these assumptions, there is no reason why we should not adopt the appropriate procedures, whether for testing for associations between variables or generalizing from a random sample to a larger population* (Dey, 1993, 29).

4.8.1. Analysis of the International Students' Results Collected in Section 4.7.3.1

Section 4.7.3.1 contained detailed results of international students' participants who participated in the websurvey.

This sub-section is designed to make sense of the results collected in the sub-Section 4.7.3.1 and make an interpretation of what has been perceived at first glance.
The following are analysed summaries and outlines of the participating international students' results that would help to understand their preference for paralingual webpage layouts; in addition to other information such as the age groups of international students, and their activities online. Hence, such information would help university administrators, international students' advisors, university staff and the Arab consulates to communicate more easily with students and be more understanding of their concerns.

- These particular findings will be analysed thoroughly. The majority of the international students had a split decision with regards to paralingual webpage layouts between layout six and layout three, scoring forty two per cent for each layout. Based on the participants' responses, the majority preferred to read the webpage's contents in Arabic, because both layout six and layout three begin with the Arabic translation of the English text. None of the participants has chosen layout two layout five, and only eight per cent of the

participants have chosen to read the English text first, as appears in layout one and in layout four. A copy of the layouts is shown in Appendix F.

- The majority of international students thought that the paralingual webpage layout that they have selected as their preference was easy to understand and read in both English and Arabic. Twenty five per cent of the participants said that a paralingual webpage layout also helped them learn new vocabularies. This is an indication that the paralingual design could be used as a teaching tool to help beginners learn new words in English.
- The majority of international students who participated thought that paralingual layouts were most important to have on a website and they would increase online usage.
- The majority of the international students lived one to three years in New Zealand; the majority of the participants were from Hamilton; the majority of the international students participants were between twenty five to forty years old; and the majority who participated were from The Kingdom of Saudi Arabia.
- The majority of international students in the websurvey use the Internet three to five hours daily, and according to their responses paralingual webpage layouts would increase their Internet usage; the majority of the participants have broadband at home; the majority thought that it was important to have Internet connection at home; the majority of participants have a PC at home; the majority have used computers for more than ten years, which means they have been using computers in their own countries; before they came to New Zealand; and the majority of students were males.

4.8.2. Analysis of the Results Concerning Immigrants, Refugees, & Others Collected in Section 4.7.3.2

Section 4.7.3.2 contained detailed results of immigrants, refugees and others participants who participated in the websurvey.

This sub-Section is designed to make sense of the results collected in the sub-section 4.7.3.2 and make an interpretation of what has been perceived at first glance.

The following are analysed summaries and outlines of the immigrants, refugees and others participants' results that would help to understand their preferences for paralingual webpage layouts, in addition to other information such as their age groups, and their activities online. Such information would help NGOs and GOs dealing with refugees and immigrants as well as e-government websites' developers.

- These particular findings need to be analysed thoroughly: the majority of immigrants, refugees and others preferred to read the Arabic translation as it appears in layout six. Fifteen per cent of the participants preferred layouts two and three; eight per cent of the participants preferred layout one; and no one had selected either layout four or layout five. These findings are remarkable because they differ from the international students' findings, although they all speak the same language. A copy of the layouts is shown in Appendix F.
- The majority of the participants thought that their preferred paralingual webpage layout was easy to read and understand in English and Arabic. Eighteen per cent thought that it helped them also learn new vocabularies.
- The majority of the immigrants, refugees; and others thought that the paralingual webpage layouts are most important, and they would increase their online usage. This indicates that immigrants, refugees and others would search for paralingual important information online.
- The majority of the participants had been living in New Zealand for more than ten years; on the other hand eighteen per cent of the participants were living outside New Zealand.
- The majority of the participants were from Auckland, and were over forty years old, which means that older immigrants, refugees and others are these most in need of presenting information on e-government sites using paralingual layouts.
- The results indicate that the immigrants and refugees were from different countries particularly Iraq, Lebanon and Palestine; but according to the literature review Arabic speaking immigrants and refugees living in New Zealand came from fourteen different Arab countries. This indicates that only some Arabic speaking nationalities had participated in the websurvey.

- The majority of the participants spent three to five hours on the Internet daily; all of the participants had broadband at home; all of the participants thought that it is important to have Internet connection; and all of the participants have a PC at home.
- The majority of the immigrants, refugees, and other participants who were employed were females; the majority of the participants were females; and the majority of the participants have used computers for more than ten years.

The comparisons between international students and immigrants, refugees and others from Section 4.8.1 and Section 4.8.2 respectively are presented completely in Appendix H where some of the interesting and diverse relationships are presented in charts to explore and explain the similarities and differences between international students and immigrants, refugees and others.

4.8.3. Analysis of the Women's Results collected in Section 4.7.3.3

Section 4.7.3.3 contains detailed results of participants classified as women who participated in the websurvey.

The following are analysed summaries and outline the results concerning the participants classified as women which will help to understand their preference concerning paralingual webpage layouts, in addition to other information such as the women's age groups and their activities online. Such information would help NGOs and GOs as well as e-government websites' developers dealing with participants classified as women.

- The majority of participants classified as women have selected layout six and layout three. In addition, nine per cent of the participants have selected layout one, twenty five per cent have selected layout two, and no one has selected layout four nor layout five.
- The majority of the women participants thought that their paralingual webpage layout preference was easy to read and understand in English and Arabic, and twenty five per cent of them thought that it would help them learn new vocabulary.

- The majority of women participants thought that paralingual webpage layouts would increase their online usage.
- The majority of the women participants thought that the paralingual webpage layout was most important.
- The majority of the women participants were immigrants; the majority were from Iraq; some were from Palestine and Lebanon; and less were from Egypt, Canada and Oman.
- The majority of the women participants were living in New Zealand, and have lived in New Zealand for more than ten years. The majority were over forty years old; the majority used the Internet three to five hours daily; they all had broadband at home; they all had a PC at home; and fifty per cent of the women's participants were employed.

4.8.4. Analysis of the Men's Results collected in Section 4.7.3.4

Section 4.7.3.4 contained the detailed results of men's participation in the websurvey.

The following are analysed summaries and outline the results concerning the participants classified as men that will help to understand their preference for particular paralingual webpage layouts, in addition to other information such as the men's age groups, and their activities online. Such information would help NGOs and GOs as well as e-government websites' developers dealing with participants classified as men.

- The majority of men participants selected layout six, some selected layout three; a few have selected layout one; less have selected layout two and layout four; and no one has selected layout five.
- The majority of men participants thought that paralingual webpage layouts were easy to read and understand in English and Arabic. The majority of men's them also thought that paralingual webpage layouts would increase their online usage; and the majority graded paralingual webpage layouts as most important.
- The majority had been living in New Zealand between one to three years; and the majority were between twenty five to forty years old.

- The majority were from the Kingdom of Saudi Arabia; some were from Palestine and Oman; and a few were from Iraq. The majority of male participants were international students; some were immigrants, a few were classified as others; and no refugees. The majority of men's participants were unemployed.
- The majority of men participants spent three to five hours online daily; the majority had broadband at home; all had a PC at home and believed that it is important to have Internet at home. The majority of had used computers for ten years or more.

The comparisons between women and men from Section 4.8.3 and Section 4.8.4 respectively, are presented completely in Appendix I, where some interesting and diverse relationships are shown in charts to explore and explain the similarities and differences between women and men.

4.8.5. Differences in Sub-Section s 4.8.1 and 4.8.2; and Sub-Section s 4.8.3 and 4.8.4

This subsection consists of the differences mentioned in the analysis of the results of:
1) The international students; and immigrants, refugees, and others that are covered in sub-Sections 4.8.1; and 4.8.2 respectively; and
2) The women and men that are covered in sub-Sections 4.8.3; and 4.8.4 respectively.
In order to reassess each group's desires and needs it would help to revisit the Gray and Elliott (2001), and Fuchs (2008) articles in the literature review in Section 1.6, where they mention society and the dynamic social theory, and the four essential dimensions or issues that affect newcomers, namely economic, social, cultural and political.

4.8.5.1. The Differences in 4.8.1 and 4.8.2

The aim is to show that there are slight differences between Arabic speaking international students and immigrants, refugees and others. Identifying these differences will assist in recognising each group's needs and requirements in respect of the four dimensions: economic, social, cultural and political. There were twelve international students participating in the websurvey. On the other hand there were fifteen immigrants, refugees and others participated in the websurvey. This

information will assist in providing prospective services according to each group's perspective, for example when providing information using paralingual design in English schools and when contacting overseas international students. Appendix H contains the results of vital issues covered in the online websurvey questionnaire presented in charts.

Table 18 shows the significant result differences between the majority of international students; and the immigrants, refugees and others in the online websurvey.

Table 18 International Students; Immigrants; refugees; and others results differences

Significant Websurvey Questionnaire	International Students	Immigrants, Refugees, and Others
Paralingual Layout Preference	The majority selected Layout 6 (Arabic on the right and English on the left), and Layout 3 (Paragraph by paragraph English on top).	The majority selected Layout 6 (Arabic on the right and English on the left).
The Importance of Paralingual Design on a Website	The majority selected most important.	The majority selected most important.
Age of Participants	The majority were 25-40 Years.	The majority were over 40 Years.
Time Spent on using the Internet Daily	The majority spend 3-5 hours.	The majority spend 3-5 hours.
The Participants' Gender	The majority were males.	The majority were females.
Years of Using Computers	The majority have used computers for 10 years or more.	The majority have used computers for 10 years or more.

4.8.5.2. The Differences in 4.8.3 and 4.8.4

The aim of defining the differences is to recognise in the selections that each gender has made how this will help to understand the requirements for each gender. There were eleven women participated in the websurvey and were fifteen men. This information will assist in providing valuable services according to each group's perspective, for example when providing information using a paralingual design to women regarding health services and maternity. Appendix I contains the results of vital issues covered in the online websurvey questionnaire presented in the charts.

Table 19 shows the significant differences between the majority of women and men in the online websurvey.

Table 19 Men and Women Results' differences

Significant Websurvey Questionnaire	Women	Men
Paralingual Layout Preference	The majority selected Layout 6 (Arabic on the right and English on the left), and Layout 3 (Paragraph by paragraph English on top).	The majority selected Layout 6 (Arabic on the right and English on the left).
The Importance of Paralingual Design on a Website	The majority selected most important.	The majority selected most important.
Age of Participants	The majority were over 40 years.	The majority were 25-40 years.
Time Spent on using the Internet Daily	The majority spend 3-5 hours.	The majority spend 3-5 hours.
The Participants' Legal Status	The majority were migrants	The majority were international students.
Years of Using Computers	The majority have used computers for 10 years or more.	The majority have used computers for 10 years or more.

4.9. A Reflection Analysis on the Advantages and Disadvantages of the Websurvey

This Section contains a reflection of the literature which was viewed in Section 4.5, on the advantages and disadvantages of the websurvey, which was conducted in phase-1.

Wright (2005) elaborated from published research and from his own experience about the value of conducting research by online surveys. He provides a summary of advantages and disadvantages. Wright's comments and other authors' suggestions and comments were noted in Section 4.5: such as Schonlau et al. (2002), Kaczmirek (2008), Fricker and Schonlau (2002), Selm and Jankowski (2006), Carini, Hayek, Kuh, Kennedy and Ouimet (2003), The University of Toronto (1999), and Couper and Miller (2008).

Such reflections on the advantages and disadvantages of conducted web surveys helps to avoid earlier errors and blunders, and achieve and enforce the web survey's strengths.

4.9.1 The Advantages of Online Surveys

1. Access to unique populations

The Internet enables researchers to reach participants in places that would be impossible to reach face to face (Wright, 2005). This was true for participants who took part in this research's websurvey who were living in Oman, Singapore and UAE etc.

An online survey would also be useful for conducting researches concerned with contagious medical conditions and dangerous diseases such as HIV that requires recording participants' experiences and opinions.

> *The Internet enables communication among people who may be hesitant to meet face-to-face…individuals with unpopular political views…such as Arab Americans… talking about anti-Arab sentiment in public places. These individuals and groups often can be reached on the Internet…than would be possible using face-to-face research methods* (Wright, 2005, p. 3).

2. Time

Online surveys enable researchers to reach and communicate with a large number of people in different places in a short time. From another point of view, online surveys enable researchers to perform other tasks while the data is being collected online (Wright, 2005).

Using the websurvey in this research has saved time and effort. For example the researcher could perform a preliminary analysis while awaiting responses from participants.

3. Cost

Online surveys save money compared with using a traditional survey paper format that could use a huge number of mail and post costs, compared with the low cost of electronic modes and low Internet connection costs (Wright, 2005).

4.9.2 The Disadvantages of Online Surveys

1. Sampling Issues

The characteristics of the participants are almost unknown such as basic demographic information, participants sometimes participates multiple participation. The websurvey for this research was conducted using a Facebook application that prohibits multiple participation by the same participant (Wright, 2005).
The most challenging concern in this websurvey was to reach refugees in New Zealand. An email to invite Arabic speaking refugees was sent to CEO of a major NGO in Auckland, but the response rate was very low.

Another issue that is obvious is the variation in the number of participants for each of the web survey's questions. The reason for that could be that some of the participants did not answer all of the questionnaire's questions, and the websurvey provider did allow such practice.

2. Access Issues

Some NGO leaders and charitable communities consider emailing surveys' URLs to their clients (or participants from the researcher perspective) as a SPAM.

The issue of considering online surveys a spam is one of the disadvantages of using online surveys, because it means that some co-ordinators delete emails and links to the websurvey (Wright, 2005).

4.10. Chapter Four Summary

Section 4.1 was an introduction to the online survey, and the characteristics and features of Internet surveys including web and e-mail surveys.
Section 4.2 gave a history of the background to Internet surveys background, and the methods used.
Section 4.3 contained the different types of Internet surveys, different types of web surveys and various methods used.
Section 4.4 discussed different issues and modes such as: response rate, cost, timeliness, data quality and sources of error.

Section 4.5 discussed the advantages and disadvantages of the web surveys, and the Internet surveys in general.
Section 4.6 incorporated all the empirical work that had been done to produce the websurvey like the steps, the issues encountered during the websurvey process, the questionnaire questions, and the designs used during that phase.
Section 4.7 revealed all the results associated with the websurvey that were conducted to test Arabic speakers about different paralingual webpage layouts; in addition a discussion of how the participants were introduced to the websurvey; the methods that were used; and the participants' response rate. This Section also described the different relationships and themes that could be obtained from the main results.
Section 4.8 consisted of the data analysis and findings of the websurvey results that were recorded from international students; immigrants, refugees, and others; women; and men.
Section 4.9 consisted of a reflection analysis on the advantages and disadvantages that were experienced in this research's websurvey.

4.11. Next Chapter

Next chapter is the eye tracking experiment chapter as part of Phase-2 of the data collection method. It contains detailed information about the eye tracking technique that will be conducted to gather participants' preferences for paralingual webpage layouts. In addition; the chapter contains information on the history of eye tracking; the eye tracking technique options that are available; issues concerned with the eye tracking experiment; and the process of choosing the right option. Also a clearing of issues to ensure successful performance of the eye tracking experiment.

Chapter Five: The Eye Tracking Experiment (Usability Study)

5.1. Introduction

This chapter deals with the range of possible paralingual webpage layouts, following on from Chapter 4. It also covers the eye tracking experiment, which was used along with the video recordings that will be used as data collection tools. The first phase of the methodology procedure was the online websurvey, which was covered in Chapter 4; this chapter will cover the eye tracking experiment as the second phase.

The first step is to explain the website design; the second step is to decide what would be the proper option for conducting the eye tracking experiment.

5.1.1. The Website Design for the Different Paralingual Layouts

The website uses Google Websites to design different paralingual webpage layouts that will be used for the eye tracking experiment. The following are the links for the three webpages that were used: https://sites.google.com/site/paralingualwebpage1 where Layout 1 (sentence by sentence, Arabic on top) is positioned on the left hand side; Layout 3 (paragraph by paragraph, English on top) is positioned in the middle; and Layout 2 (Arabic on the right and English on the left) is positioned on the right hand side, as shown in Figure 76.

Figure 76 Paralingual Webpage-1

Next, https://sites.google.com/site/paralingualwebpage2, where Layout 2 (Arabic on the right and English on the left) is positioned on the left hand side; Layout 1 (sentence by sentence, Arabic on top) is positioned in the middle; and Layout 3

(paragraph by paragraph, English on top) is positioned on the right hand side, as shown in Figure 77.

Figure 77 Paralingual Webpage-2

Finally, https://sites.google.com/site/paralingualwebpage3, where Layout 3 (paragraph by paragraph, English on top) is positioned on the left hand side; Layout 2 (Arabic on the right and English on the left) is positioned in the middle; and Layout 1 (sentence by sentence, Arabic on top) is positioned on the right hand side, as shown in Figure 78.

Figure 78 Paralingual Webpage-3

Each of the above webpages contains three Paralingual webpage layouts that differ in content and differ in where each element is positioned. The content and the design of these webpages look like www.settlement.org, a link which offers important information to refugees, immigrants, and newcomers such as international students and political asylum seekers.

Table 20 shows ten usability tips that were based on previous research studies.

Table 20 The Ten Usability Tips

Tips	Description
1. Forget the "Three-Click Rule"	"*Do not be put-off by the idea that users will get frustrated if they have to click more than three times to find a piece of content".*
2. Enable Content Skimming by using an F-Shaped Pattern (Based on an Eye Tracking study)	An eye tracking experiment, revealed "*that participants exhibited an F-Shaped pattern when scanning web content".*
3. Don't Make Users Wait: Speed Up Your Website	"*Use CSS sprites to improve page speed, and utilize benchmarking tools like YSlow".*
4. Make Your Content Easily Readable	*"To increase the likelihood of your readers getting the most out of your content, utilize techniques for making content easier to read".*
5. Don't Worry About "The Fold" and Vertical Scrolling	*"You shouldn't stuff all your important content at the top because you fear that users won't be able to find them otherwise".*
6. Place Important Content on the Left of a Web Page	*"First, the language of your site matters when thinking about layout considerations; when designing websites you should consider cultural design considerations.* *Secondly, for sites that are traditionally read from left to right, placing important design components at the left is a good idea; vice versa for sites whose language is read from right to left".*
7. Whitespace of Text Affects Readability	*"Be wary of the details: colour, line-heights, tracking, and so forth and be mindful of sound typography principles for the web to ensure that you're not discouraging your users from reading your content".*
8. Small Details Make a Huge Difference	*"Pay attention to the details. Use A/B split testing to test your hypothesis and find out what is the most effective design that achieves better results.".*
9. Don't Rely on Search as a Crutch to Bad Navigation	*"Don't rely on site search to remedy poor content organization, find-ability issues, and bad information architecture".*
10. Your Home Page Isn't as Important as you Think	*"A higher focus on landing pages versus your home page can get you more bang for your buck in terms of conversion and user-retention opportunities".*

(Chapman, 2010, p. 1)

These ten tips can be helpful when designing a paralingual website in the implementation study phase for further research, as will be discussed in Chapter 8.

5.1.2. The Eye Tracking Experiment

During this second phase the objective will be to record and note down all the results of participants' preference for different paralingual webpage layouts. Each participant will be observed where he/she looks and for how long. Participants will be asked to choose his/her preferred paralingual webpage layout among the three different layouts that will be displayed on a PC screen.

Each of the participants will be asked to start reading his/her preferred layout that is already displayed on the screen. This will be recorded using an eye tracking technique, therefore the recording of the eye gaze looking at the preferred layout will indicate the participants' attention to that particular paralingual layout.

First of all, it is important to describe the eye tracking technology; its software and hardware; how data are gathered; and how it is analysed. The following definition identifies eye tracking as an analyser of a person's visual gazes: *"Eye tracking is the process of analyzing an individual's optical focus to measure focus time, point of focus, and eye movement. Eye tracking tracks the gaze of the eye as it focuses on various objects or surfaces"* (Rajan, 2012, p. 1). Thus, the three units of analysis that Rajan mentions that could be related to the eye tracking experiment are:

1. Time which the participant spent on reading his/her preferred layout.
2. The point of focus means which layout the participant is looking at in each of the three webpages as shown in figures 76, 77, and 78.
3. The eye movement means when the participant looked up difficult English words in the Arabic translation.

On the other hand another classification describes eye tracking as where the eye is looking: *"Eye tracking measures where a person is looking. Eye tracking can be used as a scientific tool and in many applications for Human Computer Interaction (HCI). Analogue techniques for eye tracking have been available for many years"* (Li, 2006, p. 11).

Similar to which Li mentioned above, a third characterization of eye tracking describes the person's eye conduct: *"Eye tracking is a technique whereby an*

individual's eye movements are measured so that the researcher knows both where a person is looking at any given time and the sequence in which their eyes are shifting from one location to another" (Poole & Ball, 2010, p. 1). The goal of the eye tracking experiment is to determine the time spent by the participant reading his/her preferred layout.

Duchowski (2007) has described exactly the motive and the interest in recording and knowing the human eye movements during webpage usability experiments.

> *In approaching the topic of eye tracking, we first have to consider the motivation for recording human eye movements. That is, why is eye tracking important? Simply put, we move our eyes to bring a particular portion of the visible field of view into high resolution so that we may see a fine detail whatever is at the central direction of gaze. Most often we also divert our attention to that point so that we can focus our concentration (if only for a very brief moment) on the object or region of interest. Thus, we may presume that if we can track someone's eye movements, we can follow along the path of attention deployed by the observer found interesting, that is, what drew their attention, and perhaps even provide a clue as to how that person perceived whatever scene she or he was viewing* (Duchowski, 2007, p. 3).

The above quote describes how to bring the gaze actions in high resolution to see them in detail would help to provide a clue as to how participants perceive what is interesting and what drew their attention. This is precisely what will be expected in the eye tracking experiment, where participants will be expected to disclose their preference by observing which layout draws their attention the most.

This chapter is organised into sections and subsections to highlight the various characteristics of the eye tracking technology; the different techniques implemented while conducting an eye tracking experiment; the history of eye tracking, and its applications:

Section 5.2, the historical background of eye tracking and its applications.

Section 5.3, eye tracking techniques, and the options that are available.

Section 5.4, issues surrounding the eye tracking experiment.

Section 5.5, empirical work.
Section 5.6, the eye tracking experiment results.

5.2 The History of Eye Tracking and its Applications

This section is subdivided into two subsections: Section 5.2.1 gives details of the history of eye tracking, which goes back to the early 1700. Section 5.2.2, presents a discussion of the applications of eye tracking in different fields of science.

5.2.1 The History of Eye Tracking

The interest in studying and tracking the human eye movement goes back to the eighteenth century, when the scientist Porterfield, provided qualitative description of the eye movement in 1737; and when the scientist Wells in 1792 used what was called ghost images to describe eye movements (Drewes, 2010).

In the nineteenth century other scientists such as Louis Javal in 1879 were interested in eye movement. He noticed that people pause while reading through a page, and was able to apply methods for tracking the eye's fixation location, using mechanical contact with the eye's cornea (Lewis, 2006). Drewes (2010), also mentions others such as Lamare in 1892 who introduced the French word *saccade* to describe the rapid eye movement, then Ahrens in 1891, Delabarre in 1898, and Huey in 1898 recorded the movements by using small levers attached to the eyeball to transfer the movements to a surface covered with dust.
Drewes concluded that in the early twentieth century Dodge and Cline used a photographic method and from the eye light reflection. In 1905, McAllister and Steel used motion picture photography to record system movement, which is a frame-by-frame analysis that is a solid quantitative research results. Tinker used the eye movement in reading the effect of layout, font and size. In 1939, Jung was the first to apply Electrooculography (EOG) measuring the electric fields of the eye ball.

Afterwards, in 1947, Fitts was interested in recording air force pilots' eye movements. Hartridge and Thompson were the first to invent head mounted eye trackers in 1948. Then in the 1970s and 1980s after the invention of mini computers, eye tracking was used in the field of psychology to study perception and recognition.

Then, from the 1990s to the present there has been an increased interest in using eye tracking for human computer interaction, and in website usability studies (Drewes, 2010).

5.2.2. The Eye Tracking Applications

Duchowoski (2002) classified the emergence of eye tracking interactive applications according to their characteristics:

> *(1879-1920) defined by the discovery of many basic eye movement facts, including saccadic suppression, saccade latency, and the size of perceptual span; (1930-1958) characterised by a more applied research focus, coinciding with the behaviourist movements in eye movement recording systems facilitating increasingly accurate and easily obtained measurements. A wide variety of eye tracking applications now exist, which can broadly be dichotomized from a system analysis point of view as diagnostic or interactive* (Duchowski, 2002, p. 455).

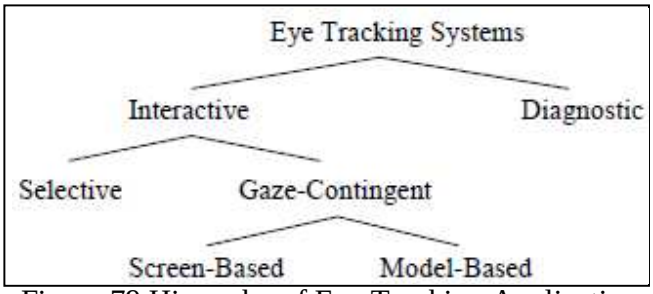


Figure 79 Hierarchy of Eye Tracking Application (Duchowski, 2002, p. 455)

Duchowski (2002) illustrates in Figure 79 the hierarchy of eye tracking systems that are subdivided into two main applications, interactive and diagnostic. The diagnostic application is used to record the user's eye movement to a given display on the PC screen. This scenario is very similar to the eye tracking experiment that will be used in this study.

On the other hand, interactive systems interact with the user, and are subdivided into two subtypes applications: selective and gaze-contingent. An example of the selective application is the use of gaze as corresponding to an input or commanding device such as a mouse; this application could be very useful to people with disabilities.

However, gaze-contingent applications make use of information about the user's gaze to facilitate moving complex images. these applications are used in simulations (Duchowski, 2002).

Similarly, Li (2006) classifies human computer interfaces that employ eye movement into active and passive interfaces.

> *Active interfaces allow users to explicitly control the interface through the use of the eye…eye typing allows the user to look at keys on a virtual keyboard to type…similarly, systems have been designed that allow users to control the mouse pointer with their eyes…Passive interfaces, on the other hand, monitor the user's eye and use this information to adapt some aspect of the display or to react according to the users' behaviours* (Li, 2006, p. 3).

Drewes (2010) points out the applications of eye tracking technology to various walks of life such as:

- Advertising, Marketing and Usability Research: eye tracking is used to track potential clients' eyes when they look at advertisement posters. A portable eye tracker is also used on research participants to be sent to supermarkets to test for positioning, colour, and if a certain product is noticeable on the shelf. The World Wide Web (WWW) and the Internet produced a demand for commercial platforms and the ease of usability of web pages, thus eye tracking would be a suitable technique to test websites for usability before going online.
- Medical Research, Eye Controls and Accessibility and in Psychology: The eye tracking technique is used in medical research and diagnostics to observe the achievement of rehabilitation for patients with brain or eye injuries. Accordingly, the eye tracking technique could make eye control accessibility possible for people with muscle diseases who are not able to access a PC and interact with others. In the field of psychology eye trackers are used in research on vision, perception and cognition. Eye tracking technique is now widely used in a number of universities to study early age learning and reading by children.

5.3. Eye Tracking Techniques, Options, Flexibility, Cost and Data Quality

This section discusses very important factors that are related to eye tracking such as the eye tracking techniques, options, flexibility, cost, and data quality respectively.

5.3.1. Eye Tracking Techniques

Eye tracking techniques consists of the methods used in eye tracking; there are three methods to track eye movements according to Drewes (2010):

- A fixation sensor to the eye: this is applied by using contact lenses connected to sensors allowing the measuring of reflected light, involving a thin wire connected to a coil that is connected to the contact lens with a measuring device. Although this procedure is not comfortable, it is very accurate, it is used in psychological and medical research.
- Electrooculography (EOG): this method uses sensors attached around the eyes to measure an electric field to measure the eye's electric field or the dipole electric. The use of this method detects the eye movement while sleeping, when the eyes are closed.
- Video-based eye tracking: this method is used in HCI for eye-gaze interaction. The method consists of hardware and software components: the hardware is a video camera connected to a PC, then the software is used to analyse and process the video images captured. There are two methods to detect the pupil: dark and bright methods. The dark method uses the camera directly to detect the black pupil in the camera image. The bright method uses infrared light reflected from the pupil, which is known as red eye effect. In addition, there are many algorithms used with video eye tracking techniques such as an example edge detection, and starburst. The bright method is used in the eye tracking experiment of this research.

5.3.2. Eye Tracking Options

Li (2006) has mentioned two video eye tracking systems; remote and head mounted. Both use video-based eye tracking, the main difference between the two is that the accuracy of a remote eye tracking system is worse than the head mounted one. It is very important to consider cost, flexibility and quality.

> *For example, the flexibility to track eye movement over a wide area can be improved by using a pan-tilt camera, but such cameras are quite expensive. Furthermore, the quality of eye tracking can be improved by capturing a high-resolution image of the eye using a zoom camera, with the trade-off a reduced operational area and higher cost. Although, there are number of promising remote eye tracking approaches, it currently appears that a head-mounted system has a greater potential to achieve a reasonable compromise between all of these factors* (Li, 2006, p. 6).

The above quote by Li (2006) lists three major and important factors - cost, flexibility and quality. He also mentions the advantages of using video based techniques, and he concluded that a head mounted system has the potential to attain most of these factors. This information could be of a great value and needs to be taken into consideration when deciding to perform an eye tracking experiment.

5.3.3. Eye Tracking Flexibility

Li (2006) describes in his study how to build an eye tracker using off the shelf components that are available at any electronic hardware store, and using open source software to analyse the images of the eye movement.

Furthermore, Li, Babcock and Parkhurst (2006) affirmed in conference proceedings that video techniques used in eye tracking are more useful in HCI and more favoured by users than analogue based techniques such as EOG. *"The primary limitation, especially relevant for application in consumer products, is the invasiveness of eye tracking systems…Video based techniques have minimised this invasiveness to some degree"* (Li, Babcock, & Parkhurst, 2006, p. 95).

Duchowski (2002) mentions that the urge to develop the flexibility of graphics will increase to enhance the applications used.

> *While the beginning of the fourth eye tracking era may coincide with an increased number of interactive applications driven by increasingly sophisticated imagery…however due to the richness and flexibility of graphical environment, it is likely that novel interactive uses of eye*

> *trackers within increasingly complex contextual situations will allow investigation of a broader class of applications than seen in the past* (Duchowski, 2002, p. 13).

5.3.4. Eye Tracking Costs

Li (2006) describes the cost of eye tracking equipments as an obstacle. The eye trackers that are available on the market ranges from US$ 5,000 to US$ 40,000. The cost actually is not due to hardware alone, but is due to custom software implementation and integrated digital processors used to achieve high speed performance.

Babcock and Pelz (2004) introduce another design for a head mounted eye tracker that would contribute towards reducing the cost of eye tracking to be implemented in HCI research. *"Eye tracking systems that use video-based cameras to monitor the eye and scene can be made significantly smaller thanks to tiny micro-lens video cameras"* (Babcock & Pelz, 2004, p. 109).

Furthermore, Drewes (2010) predicts that eye trackers will be soon affordable that people would be able to use their mobile phones as eye trackers by taking advantage of the video streaming cameras mounted on them, plus a software application that could be easily installed.

Kumar (2006) has classified the cost of building a commercial eye tracker into: *"a) material costs (hardware); b) research and development costs (hardware and software); and c) business costs (manufacturing , marketing, sales and support)"* (Kumar, 2006, p. 2).

5.3.5. Eye Tracking Data Qualities

Holmqvist, Nyström and Mulvey (2012) have listed six factors that influence eye tracking data quality:

> *1. Participants have different eye physiologies, varying neurology and psychology, and differing ability to follow instructions. Some participants may wear glasses, contact lenses, or mascara, or may have long eyelashes or droopy eyelids which all interfere with the eye image and may or may not be accounted for in a system's eye model.*

2. Operators have differing levels of skill, and more experienced operators should be able to record data with higher quality. Operator skills include adjusting eye to camera angles and mirrors, monitoring the data quality in order to decide whether to recalibrate, as well as providing clear instructions to the participants.
3. A task that requires participants to move around a lot, for example, could affect data quality. A task that causes participants blink more often leads to more data loss, unless blinks are modeled as eye events.
4. The recording environment has a strong influence on data quality. Was the data collected outdoors in sunlight or indoors in a controlled laboratory environment, for instance? Were there any vibrations in the room that reduced the stability of the eye movement signal? These factors should be considered
and reported.
5. The geometry, that is the relative positions of eye camera, participant, and stimulus affects data quality, as does the position of the head in what is known as the head box. This may be of particular importance when using eye trackers as a communication aid for the disabled, who may be constrained in their movement or sitting/lying position.
6. The eye tracker design does of course have a large impact on the quality of the recorded data. Simply put, an eye tracker consists of a camera, illumination, and a collection of software that detects relevant features in the eye, and map these to positions on the screen. The resolution of the video camera and the sharpness of the eye image are important factors that are directly related to some aspects of data quality. Equally important are the image analysis algorithms, the eye model, the eye illumination and the calibration procedure. Eye tracker system specifications will also have an influence on data quality. The most quoted system specification is sample rate, or sampling frequency. Sample frequency will dictate the system's ability to record brief events and to produce accurate velocity profiles. Finally, whether the eye tracker records monocularly or binocularly is of interest. Accuracy and precision of fixation data may improve if data from two eyes is combined, particularly if using a dispersion based fixation detection method, but, if data from two eyes are not separable, saccade velocity profiles, microsaccades, drift, and saccade amplitude measures will lose validity (Holmqvist, Nyström, & Mulvey, 2012, p. 47).

The following are explanations or remarks of the eye tracking experiment of this research to each of the factors that Holmqvist et al., (2012) mentioned above:
1. These variations existed while performing the eye tracking experiment of this research. For example, while some participants did not have any trouble performing the experiment and the calibration to associate the participant's pupil with the eye tracker camera, others took more time to set up the eye tracker experiment.
2. The options that were available with the eye tracker that was used in the eye tracking of this research made it easier to record data.
3. The participants in the eye tracking experiment of this research were given clear instructions to follow that helped maintain data quality.
4. The data of this eye tracking experiment of this research was collected and recorded in a controlled laboratory environment. For example, the outdoors sunlight effect was eliminated because it could alter the calibration of the eye tracker.
5. The geometry was under control and accurate due to the calibration mode that was available and built in with the eye tracker.
6. For technical specifications of the Mirametrix eye tracker from the Mirametrix Research Inc. please refer to Appendix J.

5.4. Issues Surrounding the Eye Tracking Experiment

This section contains a discussion of the issues surrounding the eye tracking experiment and the challenges that the researcher was running up against and how he identified and eliminated them.

First, it was very difficult to determine and make a choice of the eye tracking equipment to be used for this experiment. This process took four months to find the right equipment; to get the approval of Head of Department of Computer Science at the University of Waikato in Hamilton; and to get the eye tracking equipment shipped from Mirametrix Research Inc. in Canada.

Second, to identify potential participants in Hamilton was a big challenge, because the researcher was a distant student living in Auckland, about 120 kilometres away from Hamilton. NGO refugees' settlement centres were reluctant to release any information regarding their clients due to protecting their privacy and dignity. On the

other hand the international students' language schools were very cooperative and arranged to supply more than twelve potential participants out of a total of twenty four participants who participated in the eye tracking experiment.

5.5. The Empirical Work of Setting up the Eye Tracking Experiment

This section consists of a description of the work done in preparation for the eye tracking experiment to be performed and the experimental scientific steps and methods that were implemented.

Colby College (2009) has listed seven steps of experimental methods for scientific research:

> *"1. Make observations, 2. Form a hypothesis, 3. Make a prediction, 4. Perform an experiment, 5. Analyse the results of the experiment, 6. Draw a conclusion, and 7. Report your results"* (Colby College, 2009, p. 1).
>
> 1. As a general observation, newcomer Arabic speakers such as refugees and immigrants have difficulties accessing important information that is available on the Internet, due to language difficulties.
> 2. The hypothesis is that paralingual websites could help Arabic speakers' with English language barriers.
> 3. The prediction is that people have different styles and different preferences when it comes to reading paralingual webpages.
> 4. This experiment is set up to test Arabic speakers' preference for different webpage layouts; in other words, what webpage layout would the majority of Arabic speakers prefer.
> 5. The analysis will be based on the data collected, such as video recordings of where each participant was looking, in addition to other behaviour that has been captured such as looking up difficult English words in the Arabic translation during the experiments.
> 6. A conclusion will be drawn once the steps 1-5 are satisfied.
> 7. The results will be presented at the Australian Computer Doctorate Consortium in January, 2014.

In order to ensure the success of the experiment procedures and the data analysis following the data collection from the experiment, and to have the experiment under control and guaranteed to provide accurate results, a pilot study was set up with the agreement of the researcher's supervisors. The pilot study consisted of three Arab international students from the University of Waikato in Hamilton.

To help the participants preform the experiment with ease, a road map or a flow chart was used to give instructions to the participants of what they were supposed to do, as shown in Figure 80.

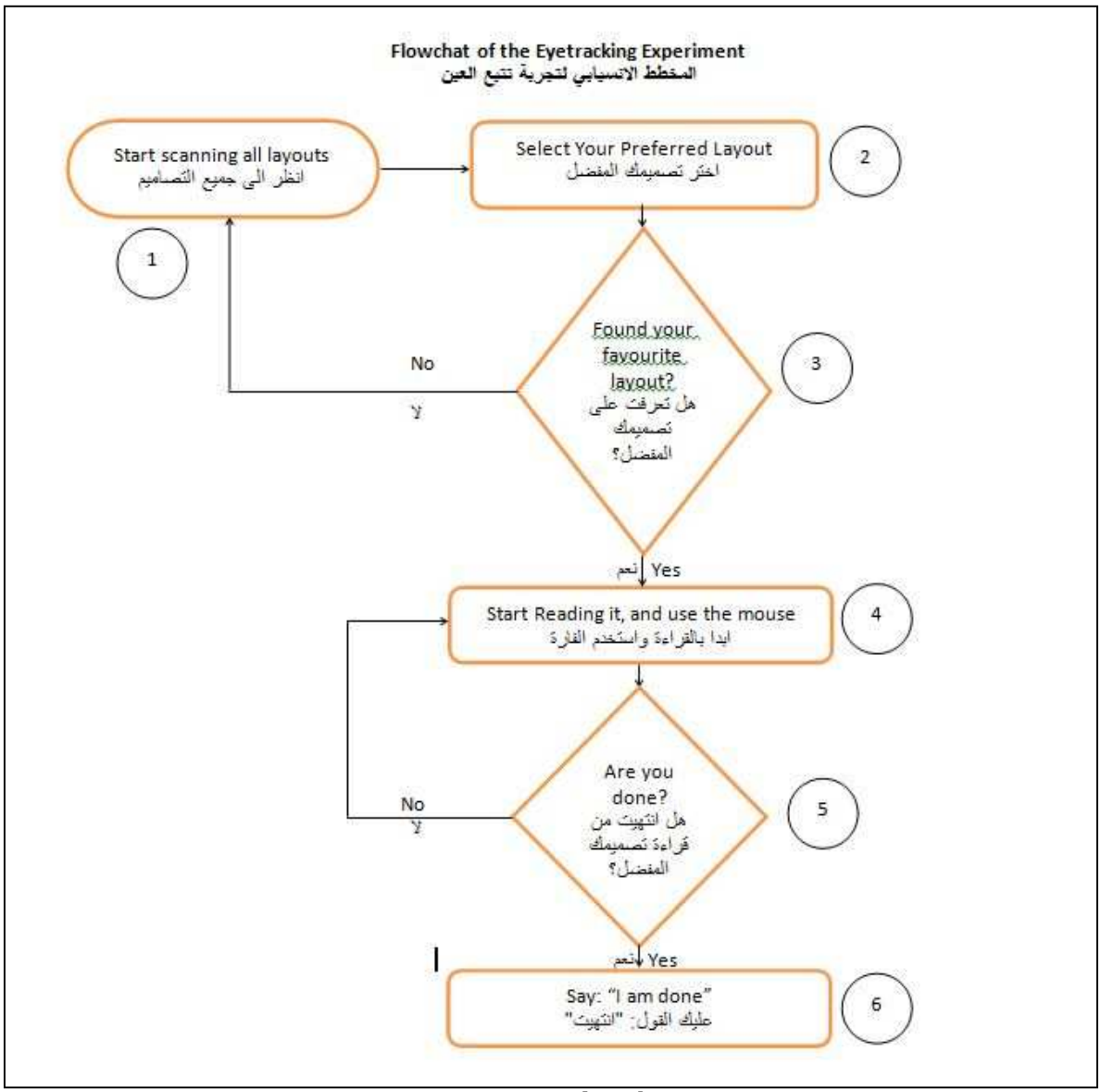


Figure 80 Participant's Flowchart

There were twenty four participants in the eye tracking experiment, four females, and twenty males, twenty one of whom were international students. The participants were given different times individually to come to the lab and participate in the experiment. The following section consists of the data collection for each of the participants.

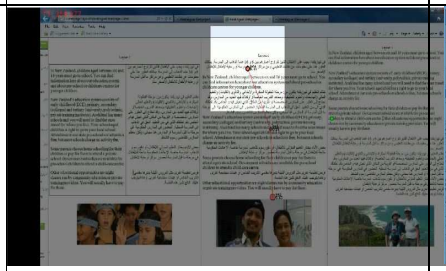
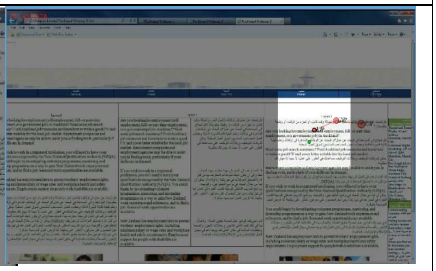
5.6. The Eye Tracking Experiment Results

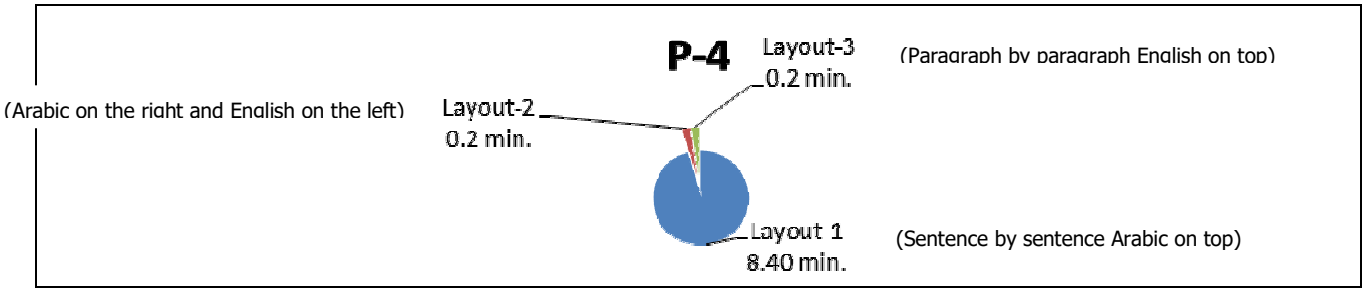
This section contains the eye tracking experiment results of participants 4, 12 and 21 as examples. However, the entire eye tracking results are presented in Appendix K.

Participant 4:

Table 21 shows that Participant 4 spent more time reading Layout 1 (sentence by sentence Arabic on top) on all of the three pages and he looked up the translation of English words in Arabic.

Table 21 Participant 4 Video Results

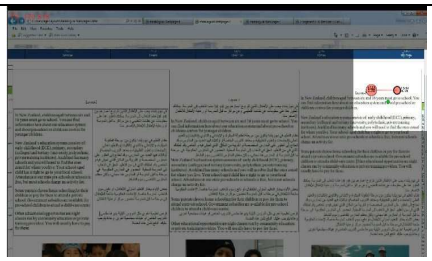
Webpage-1 (Total = 3:50 Minutes)	Webpage-2 (Total = 2:55 Minutes)	Webpage-3 (Total = 2:15 Minutes)
Area of Interest-1 (AOI-1) P 4 Spent 20 seconds looking at all three layouts. **AOI-2** P 4 started reading Layout 1 (sentence by sentence Arabic on top) the line by line presentation. He looked for difficult English words two times during reading Layout 1 (sentence by sentence Arabic on top). P 4 spent 3:30 minutes on reading Layout 1 (sentence by sentence Arabic on top)	**AOI-1** P 4 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen, and he looked up difficult English words in Arabic three times. P 4 spent 2:55 on reading Layout 1 (sentence by sentence Arabic on top)	**AOI-1** P 4 started reading the English text of Layout 1 (sentence by sentence Arabic on top); he continued reading line by line, the Arabic translation, and then the English text. P 4 spent 2:15 on reading Layout 1 (sentence by sentence Arabic on top).
		
Webpage-1	**Webpage-2**	**Webpage-3**

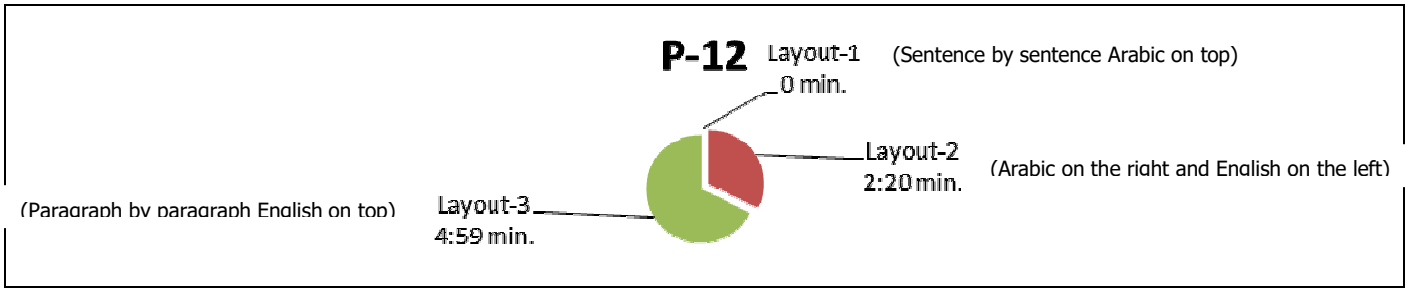


Participant 12:

Table 22 shows that Participant 12 spent more time reading Layout 3 (paragraph by paragraph English on top) on webpages 1 & 2 compared with the time spent on reading Layout 2 (Arabic on the right and English on the left) on webpage-3.

Table 22 Participant 12 Video Results

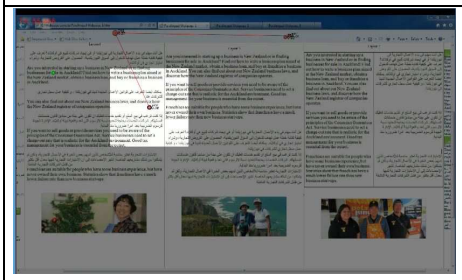
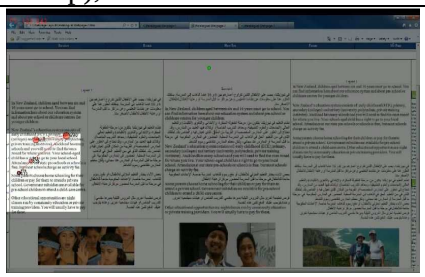
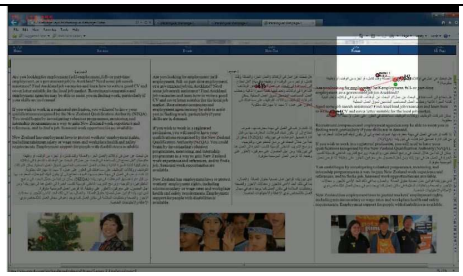
Webpage-1 (Total = 2:27 Minutes)	**Webpage-2 (Total = 2:05 Minutes)**	**Webpage-3 (Total = 2:20 Minutes)**
Area of Interest-1 (AOI-1) P 12 started looking at Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen and he started reading the English text first, and he took 2:27 minutes.	**AOI-1** P 12 started looking at the 3 layouts on webpage-2 for 13 seconds, and then he started reading Layout 3 (paragraph by paragraph English on top) positioned on the right hand corner of the screen, and he started reading the English text first. P 12 took 1:52 minutes on reading Layout 3 (paragraph by paragraph by English on top).	**AOI-1** P 12 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen. P 12 started reading the English text first; and it took him 1: 10 minutes. P 12 started reading the Arabic translation next. Of Layout 2 (Arabic on the right and English on the left). P 12 took 2:20 minutes reading Layout 2 (Arabic on the right and English on the left).
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**

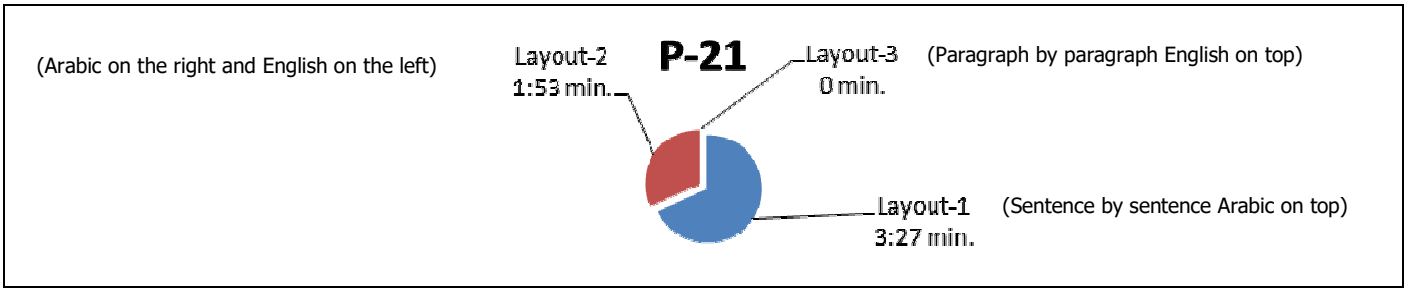


Participant 21:

Table 23 shows that Participant 21 spent more time on reading Layout 1 (sentence by sentence Arabic on top) on webpage-1 & 3 than Layout 2 (Arabic on the right and English on the left) on webpage-2.

Table 23 Participant 21 Video Results

Webpage-1 (Total = 1:30 Minutes)	**Webpage-2 (Total = 2:30 Minutes)**	**Webpage-3 (Total = 1:20 Minutes)**
Area of Interest-1 (AOI-1) P 21 started reading Layout 1 positioned on the left hand side corner of the screen, she started reading the Arabic translation, and it took her 1:30 minutes.	**AOI-1** P 21 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and she started reading the English text first and then she was reading the English text next to it, and it took her 1:53 minutes. **AOI-2** P 21 changed her AOI to Layout 1 (sentence by sentence Arabic on top), and took her 37 seconds.	**AOI-1** P 21 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and she started reading the Arabic translation, and it took her 1:20 minutes.
		
Webpage-1	**Webpage-2**	**Webpage-3**



5.7. Eye Tracking Experiment Analysis

This Section contains a brief summary of the results of the eye tracking analysis collected from the experiment.

1. Figure 81 shows that eight participants selected Layout 2 (Arabic on the right and English on the left) as their preferred paralingual layout; nine participants selected Layout 3 (paragraph by paragraph English on top) as their preferred paralingual layout; and seven participants selected Layout 1 (sentence by sentence Arabic on top).

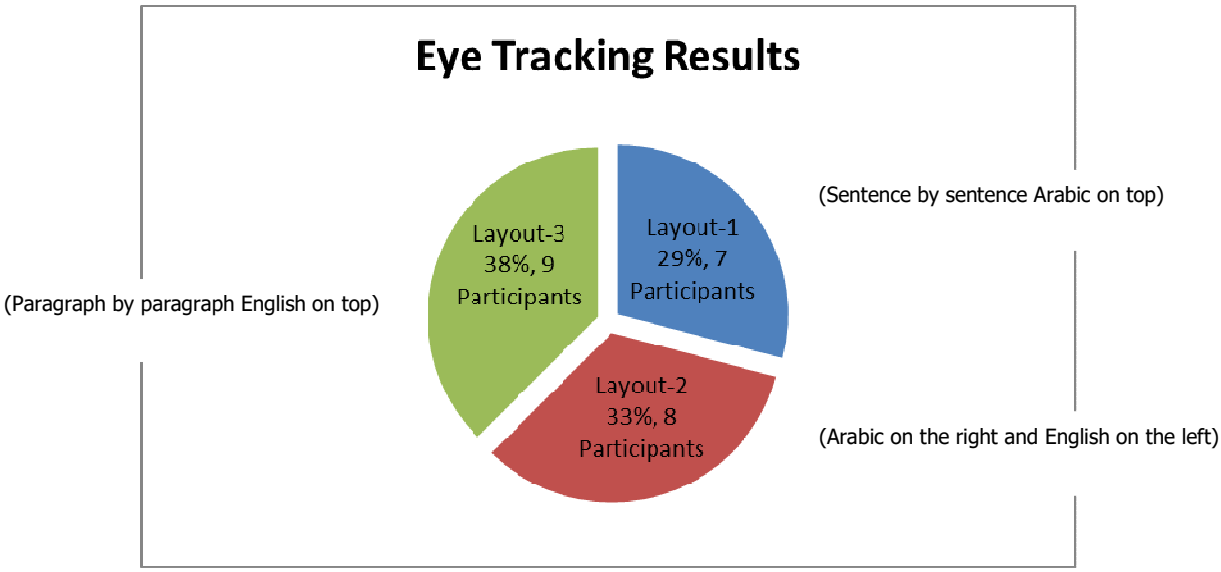


Figure 81 Eye tracking Experiment Results

2. Table 24 shows a vertical presentation of the data that has been collected during the eye tracking experiment. It shows:

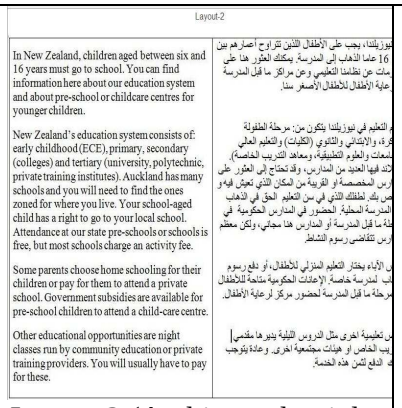
- Some participants had selected the same layout on different webpages, but their reading time varied.
- **Webpage-1:** the total participants who had selected Layout 1 (sentence by sentence Arabic on top) as their preferred layout are seven; the total participants who had selected Layout 2 (Arabic on the right and English on the left) as their preferred layout are six; and the total participants who had

selected Layout 3 (paragraph by paragraph English on top) as their preferred layout were eleven.

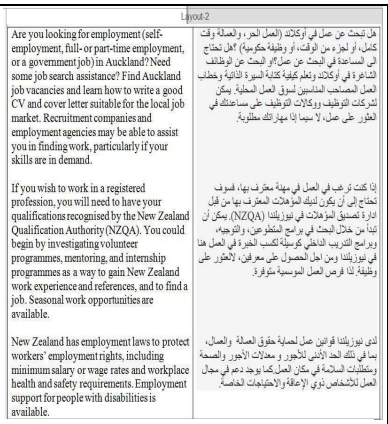
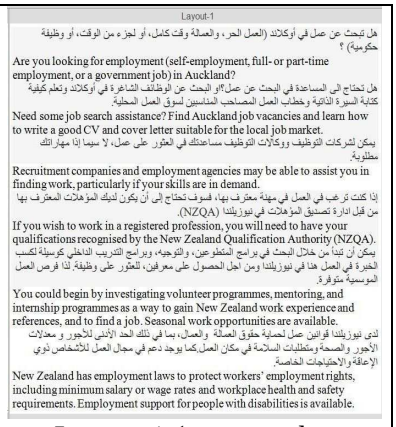
- **Webpage-2:** the total participants who had selected Layout 1 (sentence by sentence Arabic on top) as their preferred layout are six; the total participants who had selected Layout 2 (Arabic on the right and English on the left) as their preferred layout are twelve; and the total participants who had selected Layout 3 (paragraph by paragraph English on top) as their preferred layout are six.
- **Webpage-3:** the total participants who had selected Layout 1 (sentence by sentence Arabic on top) as their preferred layout are nine; the participants who had selected Layout 2 (Arabic on the right and English on the left) as their preferred layout were also nine; and the participants who had selected Layout 3 (paragraph by paragraph English on top) as their preferred layout are six. (Note that the position of the layouts on each webpage is similar to their positions during the eye tracking experiment).
- As an observation to the above data presentation, it seems that most participants are attracted to the layouts positioned in the left hand side and the middle of the screen, but that was not proven to be true in Webpage-3.

Table 24 Participants' preferred layouts of the Eye Tracking Experiment

Ps	**Webpage-1**		
	 Layout 1 (sentence by sentence Arabic on top)	 Layout 3 (paragraph by paragraph English on top)	 Layout 2 (Arabic on the right and English on the left)
P 1		Spent 2 min. and 0 sec.	
P 2		Spent 2 min and 0 sec.	
P 3		Spent 2 min. and 45 sec.	

P 4	Spent 3 min. and 30 sec.		
P 5		Spent 7 min. and 10 sec.	
P 6	Spent 10 min. and 45 sec.		
P 7	Spent 3 min. and 5 sec.		
P 8	Spent 2 min and 35 sec.		
P 9		Spent 3 min. and 0 sec.	
P 10		Spent 1 min. and 0 sec. Different than preferred layout.	
P 11			Spent 1 min. and 25 sec. Different than preferred layout.
P 12		Spent 2 min. and 27 sec.	
P 13		Spent 2 min. and 06 sec.	
P 14		Spent 3 min. and 0 sec. Different than preferred layout.	
P 15			Spent 4 min and 49 sec.
P 16		Spent 3 min and 27 sec.	
P 17			Spent 3 min and 0 sec.
P 18			Spent 1 min. and 25 sec.
P 19			Spent 1min and 52 sec.
P 20	Spent 1 min. and 56 sec.		
P 21	Spent 1 min. and 30 sec.		
P 22	Spent 1 min. and 45 sec. Different than preferred layout.		
P 23		Spent 3 min. and 10 sec.	
P 24			Spent 1 min. and 20 sec.
Tot.	7	11	6
Ps	**Webpage-2**		
	 Layout 2 (Arabic on the right and English on the left)	 Layout 1 (sentence by sentence Arabic on top)	 Layout 3 (paragraph by paragraph English on top)
P 1		Spent 1 min. and 0 sec. Different than Webpage-1.	

		Different than preferred layout.	
P 2	Spent 1 min. and 10 sec. Different than Webpage-1. Different than preferred layout.		
P 3			Spent 1 min. and 30 sec.
P 4		Spent 2 min. and 55 sec.	
P 5			Spent 3 min. and 30 sec.
P 6		Spent 10 min. and 10 sec.	
P 7		Spent 3 min. and 0 sec.	
P 8		Spent 2 min. and 0 sec.	
P 9			Spent 2 min. and 0 sec.
P 10	Spent 1 min. and 0 sec. Different than Webpage-1.		
P 11		Spent 3 min and 0 sec. Different than Webpage-1.	
P 12			Spent 1 min. and 52 sec.
P 13	Spent 3 min and 23 sec. Different than Webpage-1.		
P 14	Spent 2 min and 50 sec. Different than Webpage-1.		
P 15	Spent 4 min. and 0 sec.		
P 16	Spent 2 min. and 0 sec. Different than Webpage-1.		
P 17	Spent 2 min. and 0 sec.		
P 18	Spent 1 min and 10 sec.		
P 19	Spent 4 min and 10 sec.		
P 20		Spent 1 min and 45 sec.	
P 21	Spent 1 min. and 53 sec. Different than Webpage-1. Different than preferred layout.		
P 22			Spent 1 min and 57 sec. Different than Webpage-1.
P 23			Spent 2 min and 20 sec.
P 24	Spent 1 min. and 25 sec.		
Tot.	12	6	6
Ps	**Webpage-3**		

	 Layout 3 (paragraph by paragraph English on top)	 Layout 2 (Arabic on the right and English on the left)	 Layout 1 (sentence by sentence Arabic on top)
P 1	Spent 1 min and 25 sec. Different than Webpage-2.		
P 2		Spent 45 sec. Different than Webpage-1. Different than preferred layout.	
P 3	Spent 2 min. and 0 sec.		
P 4			Spent 2 min. and 15 sec.
P 5			Spent 3 min. and 0 sec.
P 6			Spent 8 min and 40 sec.
P 7			Spent 2 min. and 30 sec.
P 8			Spent 2 min. and 50 sec.
P 9	Spent 1 min and 23 sec.		
P10		Spent 2 min and 0 sec.	
P 11			Spent 2 min and 20 sec. Different than Webpage-1.
P 12		Spent 2 min and 20 sec. Different than Webpage-1. Different than Webpage-2.	
P 13	Spent 3 min and 53 sec. Different than Webpage-2		
P 14		Spent 1 min and 10 sec. Different from Webpage-1	
P 15		Spent 3 min. and 0 sec.	
P 16		Spent 1 min. and 0 sec. Different than Webpage-1. Different than preferred layout.	
P 17		Spent 1 min and 52 sec.	
P 18	Spent 2 min and 15 sec. Different than Webpage-1. Different than Webpage-2 Different than preferred layout.		

P 19		Spent 2 min. and 0 sec.	
P 20			Spent 1 min. and 40 sec.
P 21			Spent 1 min. and 20 sec. Different than Webpage-2.
P 22			Spent 1 min. and 4 sec. Different than Webpage-2. Different than preferred layout.
P 23	Spent 3 min. and 20 sec.		
P 24		Spent 1 min. and 37 sec.	
Tot.	6	9	9

3. Ten of the participants for difficult words in English looked up the Arabic translation, and nine of them were international students.
4. As the literature suggested, different people had different behaviour when preforming the eye tracking experiment. For example, some participants took a long time to perform the required task.
5. Having three different webpages with different contents and the three layouts positioned differently on each webpage, motivated the participants to look at the different layouts each time and read through their preferred layout.
6. The most time spent by each participant reading through a certain layout was interpreted as meaning that the layout was the one they preferred.
7. Figure 82 shows Words to Time Calculator (called a Script Timer), whereby it is possible to calculate words read per minute, if the read number of words per second is known.

So, this feature can be used to calculate the participants' reading speed. This in turn could be used to classify or sort participants according to their reading habits.

Based on the Script Timer the participants can be categorised into three categories: slow readers, average readers, and fast readers. For example the number of words in the English text in Layout 3 (paragraph by paragraph English on top) on Webpage-1 is 146; therefore, knowing the participant's time spent on this layout was say 90 seconds, then this participant's average reading speed is 1.6 words per second, therefore accordingly this participant is classified as slow reader.

The reading time spent on the preferred layout on each web page could be induced by the layout position on each webpage. The empirical experimental of the eye tracking results show that all participants' reading speeds were below the average, the reason for this was due to reading a text in a second language.

Figure 82 Script Timer
(Edge Studio LLC, 2013)

The characteristics and features discussed in this chapter, such as inducements behind the reading habits, or patterns, and the reason for choosing a certain preferred paralingual layout will be investigated further in the next chapter using a qualitative interviews method.

5.8. Chapter Five Summary

Section 5.1.1 contains a discussion and description of designing the three paralingual websites.

Section 5.1.2 contains a description of the eye tracking experiment.

Section 5.2 contains a discussion of the history of eye tracking.

Section 5.3 consists of the different techniques and options.

Section 5.4 contains a discussion of different issues surrounding the eye tracking experiment.
Section 5.5 contains the empirical work involved in the eye tracking experiment.
Section 5.6 contains the eye tracking experiment results.
Section 5.7 contains a brief analysis of the eye tracking experiment.

5.9. Next Chapter

The next chapter covers the participants' interviews as part of Phase-3 of the data collection methodology. This chapter consists of the following: a discussion of the qualitative method; types of interviews; the empirical process of interviews; the interview results; and a brief analysis.

Chapter Six: Participants' Interviews

6.1. Introduction

Here we have the third phase of the three phase methodology used in this research. the chapter explains how to implement an ethnography methodology, which is qualitative research using interviews for data collection. This qualitative method moves on from the two quantitative methods - the online web survey of twenty nine participants, and the eye tracking experiment of twenty four participants – covered in chapters 4 and 5 they developed a triangulation methodology.

Table 25 outlines the differences between qualitative and quantitative research.

Table 25 Differences between Qualitative & Quantitative Research

Qualitative Research (Interviews)	*Quantitative Research* (The Online Websurvey and The Eye Tracking Experiment)
"Tends to focus on how people or groups of people can have (somewhat) different ways of looking at reality (usually social or psychological reality)". With regard to the interviews following the eye tracking experiment, each participant has a different point of view and different reading behaviour.	*"Tends to focus on ways of describing and understanding reality by the discovery of general laws".* The online survey and the eye tracking experiment gave a general outcome of Arabic speakers' preferences for different paralingual webpage layouts without understanding why they have done so.
"Takes account of complexity by incorporating the real-world context – can take different perspectives on board." This is true in the interviews conducted; for example, with the results of the interviews the educational and social background of each participant are compared with the results of the eye tracking experiment, thus helping to clarify the motives of participants.	*"Takes account of complexity by precise definition of the focus of interest and techniques that mean that external noise can be discounted."* The ability to identify a unit of analysis to be used such as "time" in the eye tracking experiment, made collecting the results process an easy one.
"Focuses on reports of experience or on data which cannot be adequately expressed numerically." The interviews of participants provide rich data that will be used effectively in the analysis process and give more dimensions and depth to the feedback	*"Uses statistical techniques that allow us to talk about how likely it is that something is true for a given population in an objective or measurable sense."* The statistical results collected from the online websurvey, and the eye tracking experiment, helped us to understand

and recommendations of this research.	Arabic speaking population in a measurable sense.
"Focuses on description and interpretation and might lead to development of new concepts or theory, or to an evaluation of an organisational process." Qualitative methods could produce a grounded theory. The interviews strengthen and explain the results of the eye tracking experiment and both produce a new knowledge or new concept of Arabic speakers' preference for different webpage layouts.	*"Focuses on cause & effect - e.g. uses experiment to test (try to disprove) a hypothesis."* The results collected of the eye tracking experiment focused on cause and effect. The results could be used to challenge/disprove any previous results if there are any.
"Employs a flexible, emergent but systematic research process." During the interviews, sometimes the questions require more explaining and modification in order to gain more insight and understanding.	*"Requires the research process to be defined in advance."* The eye tracking experiment process was defined and controlled in advance.

(Hancock, Ockleford, & Windridge, 2009, p. 6)

A qualitative research is: subjective, holistic, phenomenological, anti-positivist, descriptive, naturalistic and inductive. On the other hand a quantitative research is: objective, reductionist, scientific, positivist, experimental, contrived and deductive (Hancock, et al., 2009).

6.2. Qualitative Research as a Descriptive Process

This section justifies using interviews following the previous two quantitative methods. Qualitative research deals with observing and interviewing participants to study and examine the social and cultural background; therefore the researcher tries to record descriptive details as much as possible. *"By studying people in their natural contexts, qualitative research tries to understand more about how specific cultures shape how and why people do things"* (Colby, 2010, p. 1). This is the incentive behind interviewing the participants in this research following the eye tracking experiment.

> *There are varied methodologies, each with their own priorities and modes for inquiry…some focus on how communities can enact change…others*

> *are based in more organizational context and may include how professional practitioners can improve their own professional practice. All approaches however have at least three common features:*
> - *Research subjects are themselves researchers or involved in a democratic partnership with a researcher.*
> - *Research is seen as an agent of change.*
> - *Data are generated from the direct experiences of research participants* (Gray2009, p. 313).

There are many forms of qualitative research such as appreciative inquiry, action research, ethnography, case study and grounded theory.

6.3. Justification for Implementing the Appropriate Research Method

The interviews that were used as data collection method in this third phase of the methodology could be easily categorised as ethnographic research methodology, case study, or as grounded theory.

6.3.1. Justification of Ethnographic Research Taxonomy

The researcher spent two hours with each of the twenty four participants consisting of one hour spent performing the eye tracking experiment, followed by interviews with each of the participants.

6.3.2. Justification of Case Study Taxonomy

The study of Arabic speakers' preferences for different paralingual webpage layouts makes this case a *"contemporary phenomenon within its real life context"* as denoted by Yin (2003).

6.3.3. Justification of Grounded Theory Taxonomy

The definition of grounded theory is that:

> *Grounded theory is a research method that seeks to develop theory that is grounded in data systematically gathered and analysed…Ground theory is an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account*

> *in empirical observations or data* (Avison & Myers, 2005, p. 247).

This is best way to describe the empirical work done to come up with a theory that is grounded in the data. The theory in this case is the Arabic speakers' preferred webpage layout, and the incentives behind it.

6.4. Interviews

Interviews are the most common method used in qualitative research - flexibility and type of the interview make it constructive and beneficial to the study. However, the process of transcribing interviews and analysing them makes them time consuming; other interviews are associated with or used in focus groups and group interviewing.

Qualitative interviews are excellent ways to get meaning through detailed examples and ironic stories; to make sense of the actions, behaviours, selections and experiences; to shed light on baffling and confusing inquiries; untangle complex and difficult actions and measures; and to recognize issues and themes to form hypotheses and theories for future research (Bates, Droste, Cuba, & Swingle, 2008). *"Interviews provide greater detail and depth than the standard survey, allowing insight into how individuals understand and narrate aspects of their lives. Additionally, interviews can be tailored specifically to the knowledge and experience of the interviewee"* (Clifford, 2010, p. 1).

6.4.1. Types of Interviews

The differences between qualitative unstructured interviewing and quantitative structured interviewing are summarised in Table 26.

Table 26 Differences between Qualitative and Quantitative Interviewing

Qualitative Interviewing	Quantitative Interviewing
"Less structured. There is an emphasis on greater generality in the formulation of initial research ideas and on interviewees' own perspectives." This relates to the interviews that were conducted.	*"The approach is structured to maximize the reliability and validity of measurement of key concepts. It is also more structured because the researcher has a clearly specified set of research questions that are to be investigated."* This was not the case in the interviews that were conducted.

"There is much greater interest in the interviewee's point of view." This point is very important - to demonstrate and gain the perspectives of the participants.	*"The interview reflects the researcher's concerns. This contrast is a direct outcome of the previous one."* This point could be true, but the concern is the participants' point of view.
"'rambling' or going off at tangents is often encouraged—it gives insight into what the interviewee sees as relevant and important." This relates to the interviews that were conducted.	*"'Rambling' is usually regarded as a nuisance and discouraged."* This was not the case in the interviews that were conducted.
"Interviewers can depart significantly from any schedule or guide that is being used. They can ask new questions that follow up interviewees' replies and can vary the order of questions and even the wording of questions." Some of what has been said here was applied during the interviews, but at the same time the researcher tried to stick to the interview questions.	*"none of these things should be done, because they will compromise the standardization of the interview process and hence the reliability and validity of measurement."* The standard of the interview process of this research was compromised, because the interview remained within the context of the interview questions, and the aim was to derive and infer as much information as possible.
"Interviews tend to be flexible, responding to the direction in which interviewees take the interview and perhaps adjusting the emphases in the research as a result of significant issues that emerge in the course of interviews." Some of the above statement is true in this research, but the researcher was both steering the interview *and* giving freedom to the participants to express their opinion or points of view.	*"By contrast, structured interviews are typically inflexible, because of the need to standardize the way in which each interviewee is dealt with."* The above statement is a true statement in regards to the interviews conducted in this research.
"The researcher wants rich, detailed answers." The above statement is completely true during the interview sessions, and applies to this research.	*"The interview is supposed to generate answers that can be coded and processed quickly."* Themes and sub-themes were generated instead of codes in order to be processed and analysed quickly.
"The interviewee may be interviewed on more than one and sometimes even several occasions."	*"Unless the research is longitudinal in character, the person will be interviewed on one occasion only."*

This was not the case in this research, however; the participants were interviewed once.	This did happen in the interviews.

(Dublin Institute of Technology, 2000, p. 313)

Similarly Bates, Droste and Cuba (2008) illustrate features of three types of interviews ranging from structured interviews used in quantitative research to less structured interviews used in qualitative research as shown in Figure 83.

The interviews that were used in this research were semi-structured interviews, with following characteristics: the questions have asymmetrical structure; the researcher initiated the questions and waited for the participants to respond; sometimes the questions were reordered during the interview; the level of language was adjusted depending on the nature of the question; and the researcher made some clarifications to some of the questions.

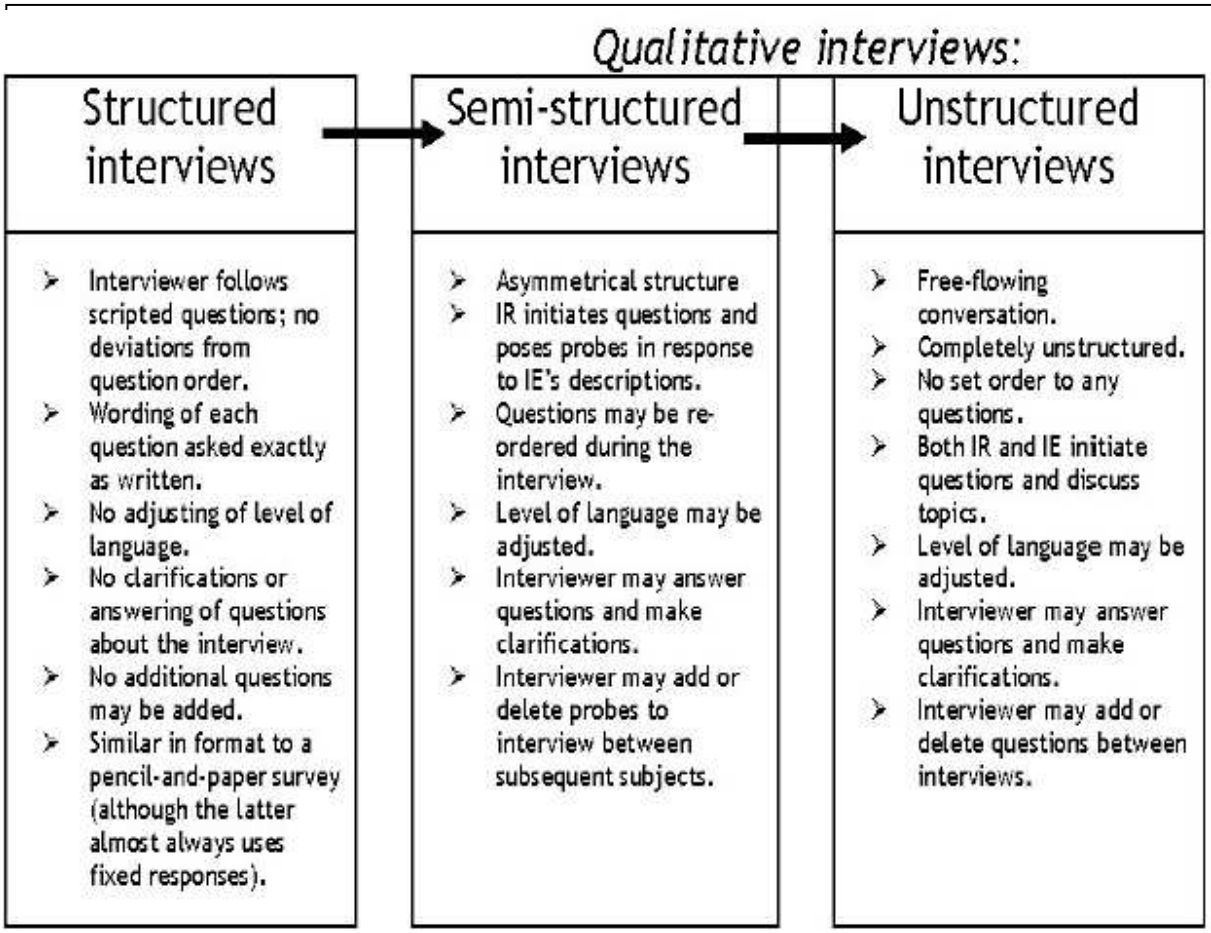


Figure 83 Types of Interviews
(Bates, et al., 2008)

6.5. The Empirical Process of Interviewing Following the Eye Tracking Experiment

There were twenty-four interviews conducted with the participants following the eye tracking experiment. The intention and purpose of conducting the interviews was to explore, study and scrutinise the reasons that led each participant to make his/her selection in the eye tracking experiment. As well to get to know the corresponding participants meticulously and up-close.

6.5.1. Steps of Interviewing

Kvale (1996) lists seven stages of an interview investigation:

*"**1. Thematizing:** Formulate the purpose of the investigation and describe the concept of the topic to be investigated before the interviews start.*
***2. Designing:** Plan the design of the study, taking into consideration all seven stages, before the interview starts.*

3. Interviewing: *Conduct the interviews based on an interview guide and with a reflective approach to the knowledge sought.*
4. Transcribing: *Prepare the interview material for analysis, which commonly includes a transcription from oral speech to written text.*
5. Analysing: *Decide, on the basis of the purpose and topic of the investigation, and on the nature of the interview material, which methods of analysis are appropriate.*
6. Verifying: *Ascertain the generalizability, reliability, and validity of the interview findings. Reliability refers to how consistent the results are,, and validity means whether an interview study investigates what is intended to be investigated.*
7. Reporting: *Communicate the findings of the study and the methods applied in a form that lives up to scientific criteria, takes the ethical aspects of the investigation into consideration, and that results in an readable product"* (Kvale, 1996, p. 88).

Following this Kvale (1996) listed nine types of interview questions with examples:

a. Introducing questions: *"Can you tell me about….?", "Do you remember an occasion when…?" "What happened in the episode mentioned?"*
b. Follow-up questions: *Direct questioning of what has just been said, nodding, "mm", repeating significant words…*
c. Probing questions: *"Could you say something more about that?", "Can you give a more detailed description of what happened?", "Do you have further examples of this?"*
d. Specifying questions: *"What did you think then?" What did you actually do when you felt a mounting anxiety?", "How did your body react?"*
e. Direct questions: *"Have you ever received money for good grades? When you mention competition, do you then think of a sportsmanlike or a destructive competition?"*
f. Indirect questions: *Projective questions such as 'How do you believe other pupils regard the competition of grades?"*
g. Structuring questions: *indicating when a theme is exhausted by breaking off long irrelevant answers: "I would now like to introduce another topic:…"*
h. Silence: *By allowing pauses the interviewees have ample time to associate and reflect and break the silence themselves. With significant information.*
i. Interpreting questions: *"You then mean that….?" "Is it correct that you feel that…?"Does the expression…. cover what you have just expressed?"* (Kvale, 1996, pp. 133-135).

The process steps listed in Kvale's (1996) quotes above were used as a framework for designing the interview questions. (The Information Sheet and the Consent Forms in English and Arabic are available in Appendix L and M respectively, and the Interview Questions are available in Appendix N).

6.5.2. Conducting the Interviews

The anticipated participants, who participated in the eye tracking experiment as previously explained in Chapter 5, were interviewed one-to-one directly following the

eye tracking experiment. All interviews were videotaped and recorded in order to be transcribed. After the interviews they were transcribed, and organised in themes and subthemes, and then presented in tables and block diagrams as collected data accessible in Section 6.6.

6.6. Interview Results (Data Collection)

This Section consists of the participants' interview results as a mean of data collection. Two approaches were used to represent the results in order to make the analysis process feasible, and three different colours were used for the three main themes (Demographics, Internet usage, and Paralingual Webpage Layouts) and these colours were used both for the subthemes and for each of the main themes as shown in Figure 84. The different colours were used in the Tables of Results as well to keep up the consistency:

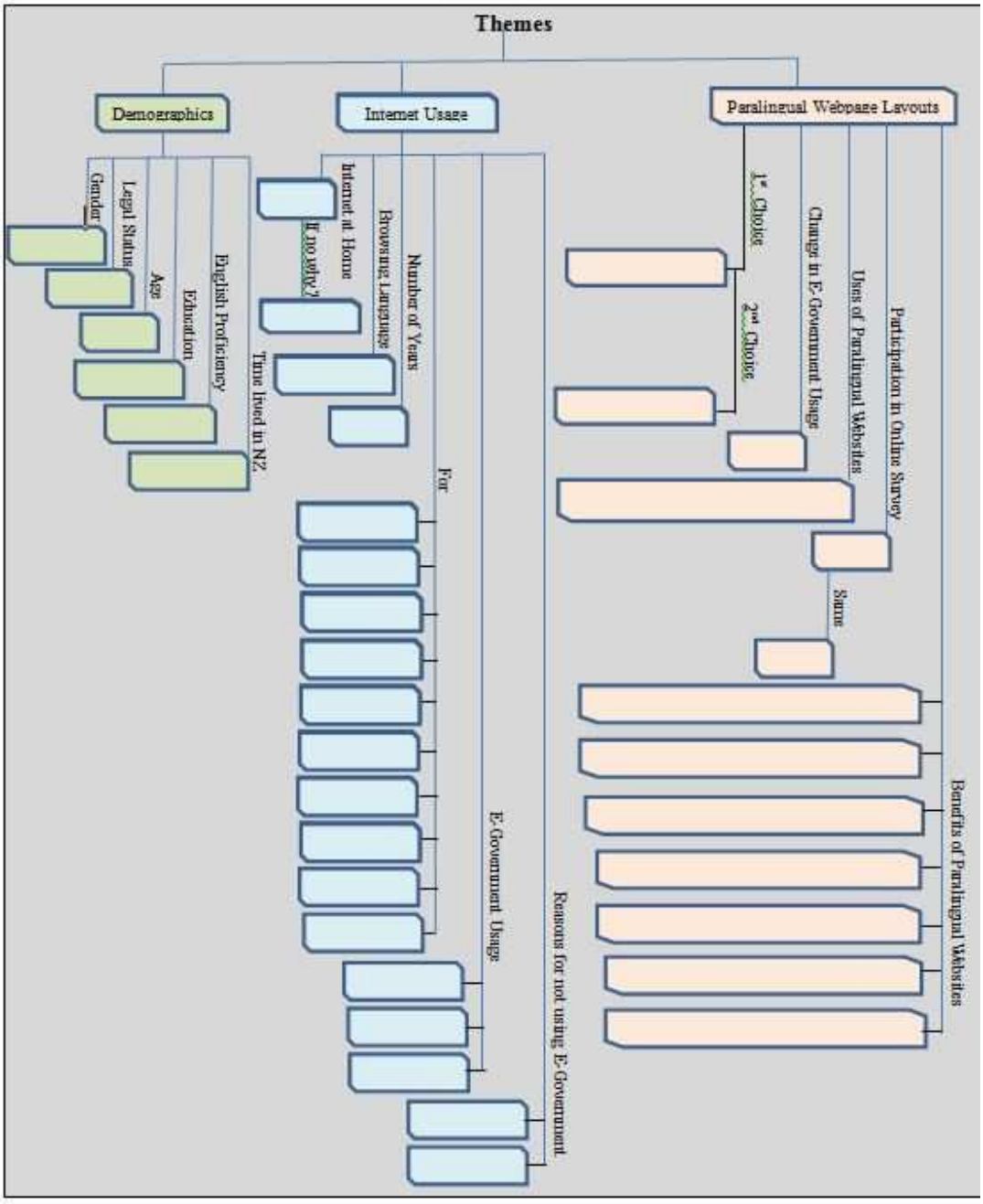


Figure 84 Themes and Subthemes of Interviews using Tree Diagram with the Associated Colours

1. The interview questions were organised into themes and subthemes as shown in Tables 1 to 24 presented in complete detail Appendix O.
2. The corresponding Figures 1 to 24 demonstrating the themes and subthemes by using diagrams for the participant are presented in Appendix P.

In order to keep the flow of reading through this Section and the Section s that follow without interruption, only some of the participants' results are presented in 6.6.1 and 6.6.2 Sub-Sections. However, the entire interview results presented in tables interview results presented in diagrams are both displayed in Appendices O and P respectively.

6.6.1. Participants' Interview Results Presented in Tables

This sub-section consists of participants 4, 12 and 21's interview results presented in Tables.

Participant 4:

Table 27 shows the interview results of Participant 4

Table 27 Participant 4 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language School	Good	3.5 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	7 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Map directions ---------- Legal information & issues ----------	No	Inadequate English language and Unaware of the information available on e-government

			Education ---------- Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence Arabic on top)	None	Yes	Paralingual websites would help in looking up the translation of difficult words.	No	Employment search ---------- Access e-government more often ---------- Creates trust in the government ---------- Could be used as an educational tool ---------- Provides newcomers with important information Saves time when looking for important information

The following is a summary of the interview results of Participant 4:

1. Demographics: P 4 is a male; international student; age between 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for three and half months.

2. Internet Usage: P 4 has Internet at home; he uses both Arabic and English to browse the Internet; he has been using the Internet for seven years; he uses the

Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps directions, Legal information and issues, Education, and Internet banking; He does not use E-government; and the reason for this is inadequate grasp of English language, and ignorance of the information available.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence, Arabic on top) was the most preferred layout as 1st choice for P 4, and no second choice; P 4 would use E-government more often if paralingual websites were available, the main reason for this being that is it would be easier to translate difficult words in English into Arabic; P 4 did not participate in the online websurvey that was conducted using Facebook on the Internet (the results are available in Chapter 4) ; P 4 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Participant 12:

Table 28 shows the interview results of Participant 12.

Table 28 Participant 12 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	30-35	High School Degree studying at English Language School	Excellent	3 Weeks
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	17 Years	Email ---------- Internet browsing ---------- Communicating with family members	Yes Infrequently	N/A

			overseas --- News --- Map directions --- Ticket reservations --- Employment --- Entertainment such as music & movies --- Education --- Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on top)	Layout 2 (Arabic on the right and English on the left)	Yes	Easy to read	No	Employment search --- Access e-government more often --- Creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important

					information ---------- - Saves time when looking for important information

The following is a summary of the interview results for Participant 12:

1. Demographics: P 12 is a male; international student; age is between 30-35; educational background is high school and still studying at an English language school; he has been living in New Zealand for three weeks.

2. Internet Usage: P 12 has Internet at home; he uses Arabic and English languages to browse the Internet; he has been using the Internet for seventeen years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Map directions, Ticket reservations, Employment, Entertainment such as music and movies, Education and Internet banking. He uses E-government infrequently.

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top) was the most preferred layout for P 12, and his second choice was Layout 2 (Arabic on the right and English on the left); P 12 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 12 did not participate in the online websurvey that was conducted using Facebook on the Internet (see Chapter 4); P 12 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Participant 21:

Table 29 shows the interview results of Participant 21.

Table 29 Participant 21 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ

Female	Immigrant	40 and up	Master in Mathematics	Excellent	16 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	16 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Map directions ---------- Tickets reservation ---------- Legal information & issues ---------- Employment ---------- Entertainment such as music & movies ---------- Education ---------- Internet	Yes Infrequently	Unaware of the information available on e-government
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence	Layout 2 (Arabic on the right and	Yes	Easy to read	Yes She did not recall what her selection	Employment search ---------- Access e-

Arabic on top)	English on the left)			was in the online websurvey	government more often creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The following is a summary of the interview results for Participant 21:

1. Demographics: P 21 is a female; immigrant; age is 40 or above; educational background is Master degree in Mathematics; she has been living in New Zealand for sixteen years.

2. Internet Usage: P 21 has Internet at home; she uses Arabic and English languages to browse the Internet; she has been using the Internet for sixteen years, since she moved to New Zealand with her family; she uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Map directions, Legal information and issues, Employment, Entertainment such as music and movies, Education and Internet banking; she uses E-government infrequently, because she was unaware of the information available on e-government.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence Arabic on top) was the most preferred layout for P 21, and Layout 2 (Arabic on the right and English on the left) was her second choice; P 21 would use E-government more often, if paralingual websites were available, the main reason being that it would be easier to

read; P 21 participated in the online websurvey that was conducted using Facebook on the Internet, but she did not recall what her selection was (see Chapter 4); P 21 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

6.6.2 Participants' Interview Results Presented in Diagrams

The entire participants' interview results are presented in diagrams are presented in Appendix P. However, the interview results of participants 4, 12 and 21 are mentioned below as examples.

Participant 4:

The interview themes of Participant 4 are shown in Figure 85. The main three themes are demographics; Internet usage; and issues concerning paralingual webpage layouts.

Participant 4 is a male; international student; age is 18-23, education is high school; good English proficiency; and he lived in New Zealand 3-5 months at the time of the interview.

Participant 4 has Internet at home; uses Arabic and English for browsing the Internet; he has been using the Internet for 7 years; uses the Internet for email, communication, news, map direction, education, legal information, and Internet banking; and he does not use e-government because he is unaware of the available information.

Participant 4 1st choice was Layout 1; the availability of paralingual websites would encourage him to use e-government; paralingual websites would help in looking for the translation of difficult words; and he mentioned a number of the benefits of paralingual design such as: employment search, access to e-government more often, creates trust in the government, could be used as an educational tool, provides newcomers with important information, and saves time when looking for information.

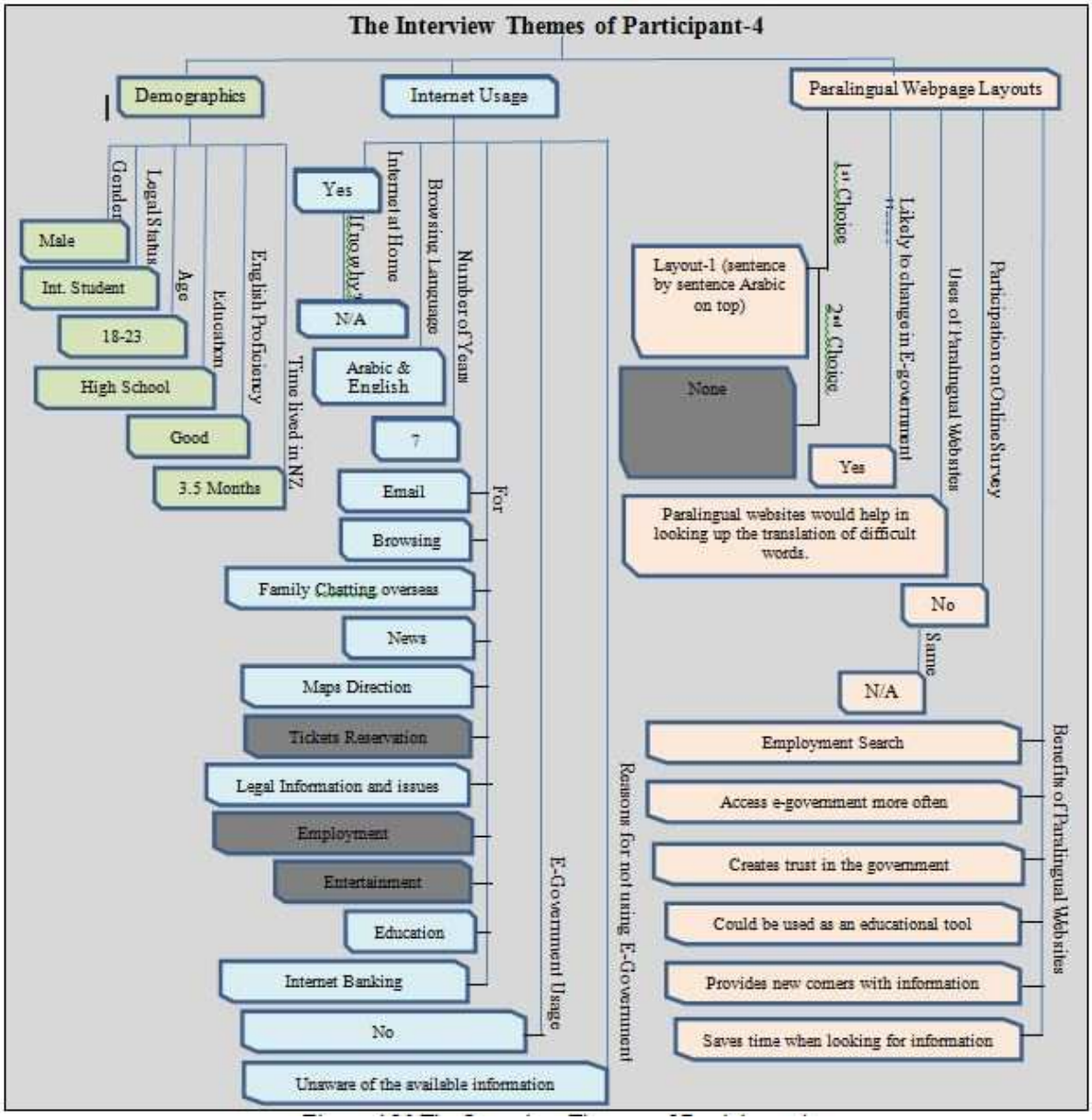


Figure 85 The Interview Themes of Participant 4

Participant 12:

The interview themes of Participant 12 are shown in Figure 86. The main three themes are demographics; Internet usage; and issues concerning paralingual webpage layouts.

Participant 12 is a male; international student; age is 18-23, education is high school; good English proficiency; and he lived in New Zealand 3-5 months at the time of the interview.

Participant 12 has Internet at home; uses Arabic and English for browsing the Internet; he has been using the Internet for 17 years; uses the Internet for email, communication, news, map direction, ticket reservation, employment, entertainment, education, and Internet banking; and he uses e-government infrequently.

Participant 12 1st choice was Layout 3, and his 2nd choice was Layout 2; the availability of paralingual websites would encourage him to use e-government; he thinks that paralingual websites are easy to read; and he mentioned a number of the benefits of paralingual design such as: employment search, access to e-government more often, creates trust in the government, could be used as an educational tool, provides newcomers with important information, and saves time when looking for information.

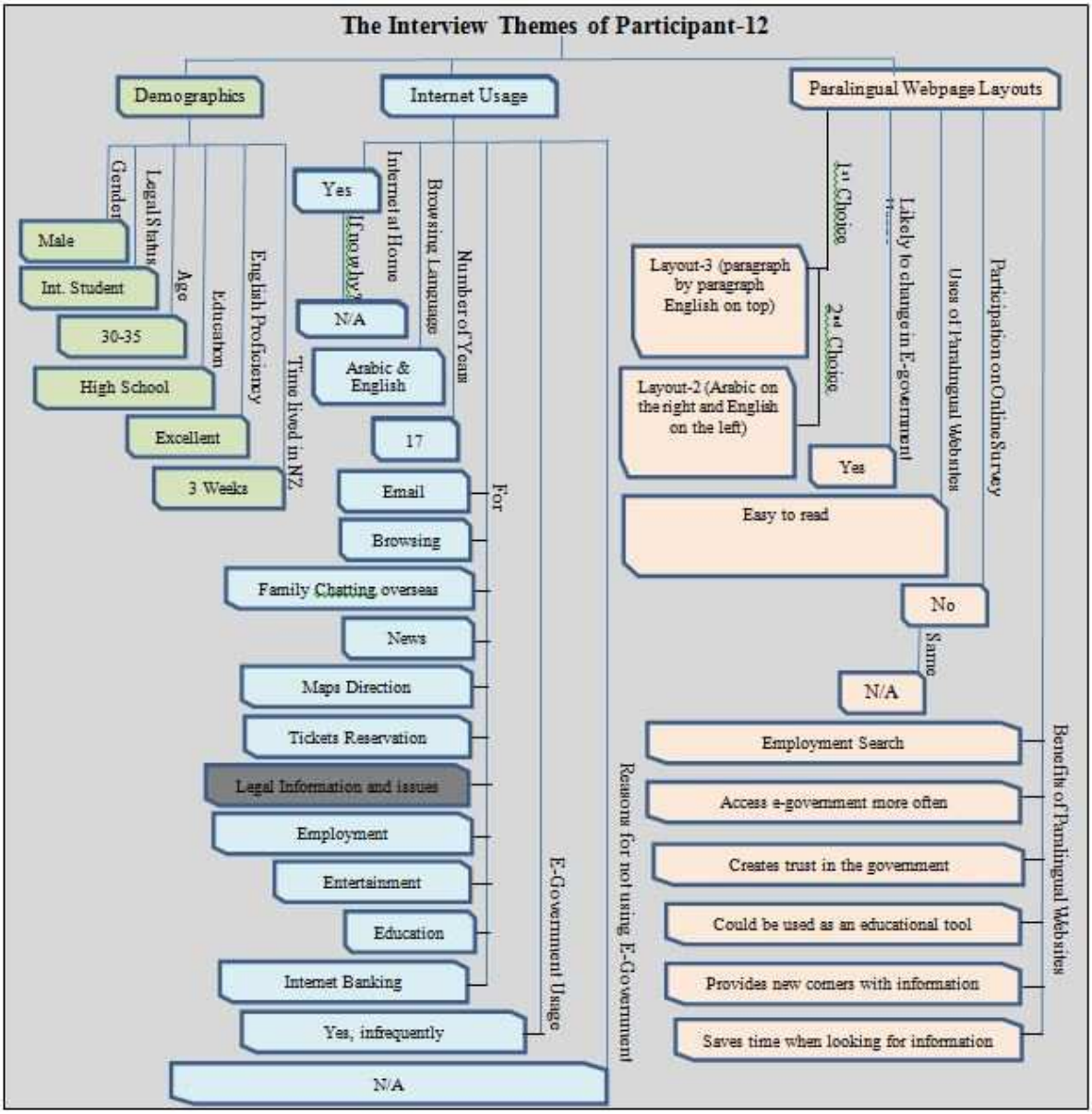


Figure 86 The Interview Themes of Participant 12.

Participant 21:

The interview themes of Participant 21 are shown in Figure 87. The main three themes are demographics; Internet usage; and issues concerning paralingual webpage layouts.

Participant 21 is a female; immigrant; age is 40 and up, education is a master degree in Mathematics; Excellent English proficiency; and she lived in New Zealand 16 years at the time of the interview.

Participant 21 has Internet at home; uses Arabic and English for browsing the Internet; she has been using the Internet for 10 years; uses the Internet for email, communication, news, map direction, ticket reservation, legal information, employment, entertainment, education, and Internet banking; and she uses e-government infrequently, and unaware of the information available on e-government.

Participant 21 1st choice was Layout 1, and her 2nd choice was Layout 2; the availability of paralingual websites would encourage her to use e-government; she thinks that paralingual websites are easy to read; she participated in the online websurvey, but she did not recall her layout selection at the time; and she mentioned a number of the benefits of paralingual design such as: employment search, access to e-government more often, creates trust in the government, could be used as an educational tool, provides newcomers with important information, and saves time when looking for information.

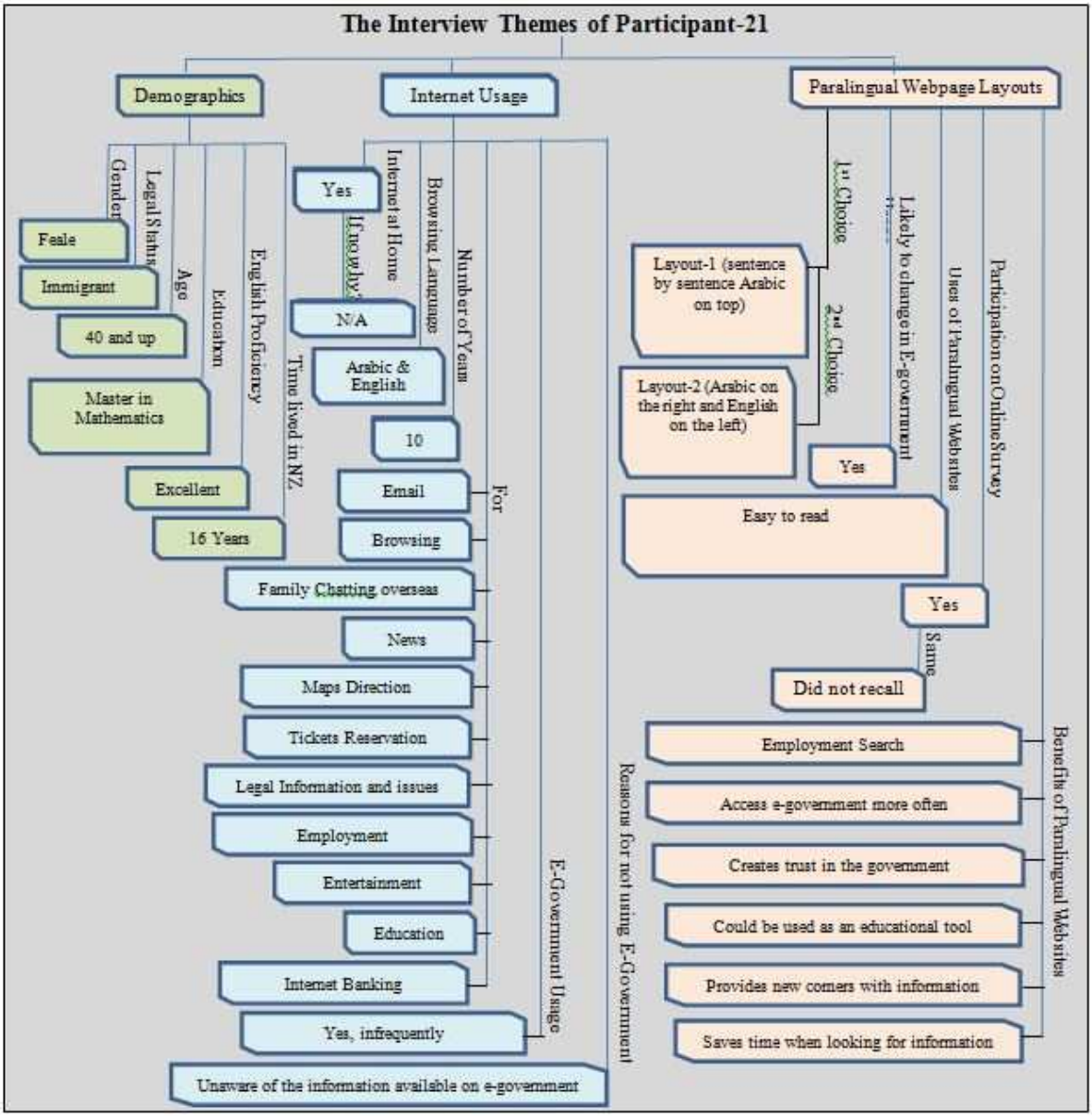


Figure 87 The Interview Themes of Participant 21.

6.7 Interviews Analysis

The entire participants' interview analyses are presented in Appendix Q, however the interview analysis of participants 4, 12 and 21 given below as examples.

Participant 4:

A summarised analysis of Participant 4 is shown in Table 30.

Table 30 Summarised Analysis of Participant 4

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 4 is male, international student, his age is in the range of 18-23, his English

proficiency is Good, and he has been in New Zealand for 3.5 months.
2. P 4 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 7 years.
3. P 4 uses the Internet for email, communicating with family overseas, news, maps direction, internet banking, education, and entertainment.
4. P 4 uses e-government infrequently.
5. P 4 selected Layout 1 (sentence by sentence Arabic on top) as his 1st choice only, and no second choice selection in the interview.
6. P 4 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations.
7. P 4 is discouraged from accessing e-government due to the English language barrier.
8. P 4 ticked the followings as the benefits of Paralingual websites: employment search, access e-government more often, creates trust in the government, could be used as an educational tool, provide newcomers with important information, and saves time when looking for important information.
9. P 4 did not participate in the online survey.
10. P 4 looked up difficult English words in Arabic translation.
11. P 4 started reading the Arabic translation first.
12. The participant was honest and truthful in the eye tracking experiment.
13. P 4 1st choice layout selection in the interview is Layout 1, matched his preferred layout selection in the eye tracking experiment.

Table 31 gives the eye tracking video analysis of Participant 4.

Table 31 The Eye Tracking Video Analysis of Participant 4.

Webpage-1 (Total = 3:30 Minutes)	**Webpage-2 (Total = 2:55 Minutes)**	**Webpage-3 (Total = 2:15 Minutes)**
Area of Interest-1 (AOI-1) P 4 Spent 20 seconds looking at all three layouts. **AOI-2** P 4 started reading Layout 1 (sentence by sentence Arabic on top) the line by line presentation. He looked for difficult English words two times during reading Layout 1 (sentence by sentence Arabic on top).	**AOI-1** P 4 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen, and he looked up difficult English words in Arabic three times.	**AOI-1** P 4 started reading the English text of Layout 1 (sentence by sentence Arabic on top), he continued reading line by line, the Arabic translation, then the English text.

Participant 12:

A summarised analysis of Participant 12 is shown in Table 32.

Table 32 A Summarised Analysis of Participant 12

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 12 is male, international student, his age is in the range of 30-35, his English proficiency is Excellent, and he has been in New Zealand for 3 weeks. 2. P 12 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 17 years. 3. P 12 uses the Internet for email; Internet browsing; communicating with family overseas; news; map directions; ticket reservation; employment; education; entertainment; and internet banking. 4. P 12 He uses e-government. 5. P 12 selected Layout 3 (paragraph by paragraph by English on top) as 1st choice, and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 12 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 12 is discouraged from accessing e-government. 8. P 12 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 12 did not participate in the online survey. 10. P 12 did not look up difficult English words in Arabic translation. 11. P 12 started reading the Arabic text first on webpage-1, and then he started with reading the Arabic translation on webpage-2. 12. P 12 did not take very long time while doing the eye tracking experiment, he was distracted and he was fully concentrating on looking at the screen and using the mouse to read the text, but he was very concerned, because his eyes were looking in all directions as shown in the video. 13. P 12 1st choice layout selection in the interview is Layout 3, matched his preferred layout selection in the eye tracking experiment.

Table 33 shows the eye tracking video analysis of Participant 12.

Table 33 The Eye Tracking Video Analysis of Participant 12

Webpage-1 (Total = 2:27 Minutes)	**Webpage-2 (Total = 2:05 Minutes)**	**Webpage-3 (Total = 2:20 Minutes)**
Area of Interest-1 (AOI-1) P 12 started looking at Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen and he started reading the English text first, and he took 2:27 minutes.	**AOI-1** P 12 started looking at the 3 layouts on webpage-2 for 13 seconds, and then he started reading Layout 3 (paragraph by paragraph by English on top) positioned on the left hand corner of the screen, and he started reading the English text first. P 12 took 1:52 minutes.	**AOI-1** P 12 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen. P 12 started reading the English text first; and it took him 1: 10 minutes. P 12 started reading the Arabic translation next. Of Layout 2. P 12 took 2:20 minutes reading Layout 2.

Participant 21:

A summarised analysis of Participant 21 is shown in Table 34.

Table 34 A Summarised Analysis of Participant 21

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 21 is female, immigrant, her age is 40 and up, her English proficiency is excellent, and she has been in New Zealand for 16 years. 2. P 21 has Internet at home, she uses English and Arabic to browse the Internet, and she has been using the Internet for 16 years. 3. P 21 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; and entertainment. 4. P 21 uses e-government infrequently. 5. P 21 selected Layout 1 as 1st choice and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 21 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 21 is not discouraged from accessing e-government. 8. P 21 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 21 participated in the online survey. 10. P 21 did not look up difficult English words in Arabic translation. 11. P 21 started reading the Arabic translation first on webpage-1, and then she started with reading the English text on webpage-2, but she started reading the Arabic translation on webpage-3. 12. P 21 did not take very long time while doing the eye tracking experiment, she was not distracted and she was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 21 1st choice layout selection is Layout 1 in the interview, matched her preferred layout selection in the eye tracking experiment.

Table 35 shows the eye tracking video analysis of Participant 21.

Table 35 The Eye Tracking Video Analysis of Participant 21

Webpage-1 (Total = 1:30 Minutes)	**Webpage-2 (Total = 2:30 Minutes)**	**Webpage-3 (Total = 1:20 Minutes)**
Area of Interest-1 (AOI-1) P 21 started reading Layout 1 positioned on the left hand side corner of the screen, she started reading the Arabic translation, and it took her 1:30 minutes.	**AOI-1** P 21 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and she started reading the English text first and then she was reading the English text next to it, and it took her 1:53	**AOI-1** P 21 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and she started reading the Arabic translation, and it took her 1:20 minutes.

	minutes. **AOI-2** P 21 changed her AOI to Layout 1 (sentence by sentence Arabic on top), and took her 37 seconds.	

Table 36 shows a summary of the interviews of the anticipated participants.

Table 36 Summary of the Interviews of the Anticipated Participants.

Part	Sex	Legal Status	Age	English Proficiency	Living in NZ	Internet at Home	Years using the Internet	Language Browsing Internet	1st Layout Selection	2nd Layout Selection	*Reason for Not using Egovernment	Online Participation	Paralingual would change using E-government
1	M	work	36-39	Excellent	7 Y	Yes	15	E & A	3	0	NA	No	No
2	M	IS	24-29	Excellent	1 M	Yes	10	E & A	2	3	NA	No	No
3	M	IS	18-23	Fair	4 M	Yes	6	E & A	3	1	2	No	Yes
4	M	IS	18-23	Good	3.5 M	Yes	7	E & A	1	0	2	No	Yes
5	M	IS	24-29	Good	1.5 M	Yes	6	E &A	2	1	NA	No	Yes
6	M	IS	18-23	Fair	4 M	Yes	12	A	1	0	1	No	Yes
7	M	IS	18-23	Good	3 W	Yes	10	E	1	2	2	No	Yes
8	M	IS	18-23	Fair	3 M	Yes	7	E & A	1	3	2	No	Yes
9	M	IS	18-23	Good	1 M	Yes	8	A	3	2	2	No	Yes
10	M	IS	24-29	Good	1.5 Y	Yes	10	E	2	3	2	No	Yes
11	M	IS	18-23	Good	7 M	Yes	7	E & A	2	1	NA	No	Yes
12	M	IS	30-35	Excellent	3 W	Yes	17	E & A	3	2	NA	No	Yes
13	M	IS	30-35	Fair	1 M	No	18	E & A	3	2	2	No	Yes
14	F	IM	40-Up	Excellent	7 Y	Yes	14	E & A	3	2	NA	No	No
15	M	IS	24-29	Good	4 Y	Yes	18	E & A	2	0	2	No	Yes
16	M	IS	24-29	Good	5 Y	Yes	12	E & A	2	3	2	No	Yes
17	M	IS	24-29	Good	4.5 M	Yes	12	E & A	2	3	2	No	Yes
18	M	IS	40-Up	Fair	8 M	Yes	10	E & A	2	0	2	No	Yes
19	F	IS	18-23	Good	9 M	Yes	7	E & A	2	0	2	No	Yes
20	F	IS	30-35	Good	8 M	Yes	10	E & A	1	2	2	No	Yes
21	F	IM	40-Up	Excellent	16 Y	Yes	16	E & A	1	2	2	Yes	Yes
22	M	IS	18-23	Excellent	3.5 Y	Yes	8	E & A	3	2	1	Yes	Yes
23	M	IS	18-23	Excellent	2 Y	Yes	8	E	3	2	NA	No	Yes
24	M	IS	18-23	Excellent	1 Y	Yes	8	E	2	3	1	No	Yes

*1: Unaware of the information available.

*2: English language barrier.

6.8. Chapter Six Summary

Sections 6.1 and 6.2 started by identifying different qualitative methodologies and different qualitative data collection methods.

Sections 6.3 and 6.4 gave the justification for implementing the appropriate research approach and types of interviews.

Sections 6.5 described the empirical process of interviews that were conducted following the eye tracking experiment.

Sections 6.6 and 6.7 contained the interview results and the interview analyses respectively.

6.9. Next Chapter

The next chapter is the analysis chapter, consisting of the following: a discussion of the triangulation method; the online websurvey analysis; the eye tracking analysis; and the participants' interviews analysis.

Chapter Seven: Analysis

7.1. Introduction

This chapter consists of the analysis of the data that has been collected and presented in Chapter 4 (the Online Websurvey) using a quantitative method to collect data; Chapter 5 (Eye Tracking Experiment) also using a quantitative method; and Chapter 6 (the Interviews) using qualitative method to collect data. These methods are commonly known as triangulation or mixed methods - to answer the same research questions or test a phenomenon within one definite research as is the case in this research, and as described in Chapter 3 the Methodology chapter.

Venkatesh, Brown, and Bala (2013) state that mixed methods are recognised as an advantage for information systems' (IS) research. They mention three values of mixed methods:

> *First, mixed methods research has the ability to address confirmatory and exploratory research questions simultaneously. Second, mixed methods research has the ability to provide stronger inferences than a single method or worldview. Finally, mixed methods research provides an opportunity for a greater assortment of divergent and/or complementary views.* (Venkatesh, Brown, & Bala, 2013, p. 24).

Creswell and Clark (2007) categorise mixed methods into four types:

- Triangulation (merge qualitative and quantitative methods to answer research questions);
- Embedded (to use a qualitative or quantitative method to answer the research questions within a qualitative or quantitative research);
- Explanatory (use qualitative method to explain quantitative results); and
- Exploratory (collect quantitative data to explain a relationship with qualitative data) (Creswell & Clark, 2007).

Venkatesh, et al. (2013) list examples of validity in quantitative and qualitative research as shown in Table 37.

The two quantitative data collection methods that were used in this research were in the online websurvey and in the eye tracking experiment described in Chapter 4 and

Chapter 5 respectively. On the other hand the qualitative data collection method was used in the interviews following the eye tracking experiment, which means that the participants who took part in the eye tracking experiment were interviewed succeeding it.

Table 37 Examples of Validity in Quantitative and Qualitative Research

Quantitative Methods	
Design Validity	Internal validity: The validity of the inference about whether the observed co-variation between independent and dependent variables reflects a causal relationship (e.g., the ability to rule out alternative explanations).
	External validity: The validity of the inference about whether the cause-effect relationship holds over variation in persons, settings, treatment variables, and measurement variables.
Measurement Validity	• Reliability: The term reliability means repeatability or consistency. A measure is considered to be reliable if it produces the same result over and over again. There are various types of reliability, such as inter-rater or inter-observer reliability, test-retest reliability, parallel-forms reliability, and internal consistency reliability. • Construct validity: The degree to which inferences can legitimately be made from the operationalization in a study to the theoretical constructs on which those operationalizations are based. There are many different types of construct validity, such as face, content, criterion-related, predictive, concurrent, convergent, discriminant, and factorial.
Inferential Validity	Statistical conclusion validity: The validity of inferences about the correlation (co-variation) between independent and dependent variables.
Qualitative Methods	
Design Validity	• Descriptive validity: The accuracy of what is reported (e.g., events, objects, behaviours, settings) by researchers. • Credibility: Involves establishing that the results of qualitative research are credible or believable from the perspective of the participants in the research to convincingly rule out alternative explanations. • Transferability: The degree to which the results of qualitative research can be generalized or transferred to other contexts or settings.
Analytical Validity	• Theoretical validity: The extent to which the theoretical explanation developed fits the data and, therefore, is credible and defensible. • Dependability: Emphasizes the need for the researcher to describe the changes that occur in the setting and how these changes affected the way the researcher approached

	the study. • Consistency: Emphasizes the process of verifying the steps of qualitative research through examination of such items as raw data, data reduction products, and process notes. • Plausibility: Concerned with determining whether the findings of the study, in the form of description, explanation, or theory, fit the data from which they are derived.
Inferential Validity	• Interpretative validity: The accuracy of interpreting what is going on in the minds of the participants and the degree to which the participants' views, thoughts, feelings, intentions, and experiences are accurately understood by the researcher. • Confirm-ability: The degree to which the results could be confirmed or corroborated by others.

(Venkatesh, et al., 2013, p. 33)

The information mentioned in Table 37 could be used as guidelines to test for validity.

7.2. Triangulation

This research methodology consists of 3-Phases of triangulation method: the online websurvey that was conducted and explained in Chapter 4 as Phase-1; the eye tracking experiment that was conducted and explained in Chapter 5 as Phase-2; and the interviews that were conducted and explained in Chapter 6 as Phase-3.

> *"More than one method should be used in the validation process to ensure that the variance reflected that of the trait and not of the method. Thus, the convergence or agreement between two methods . . . enhances our belief that the results are valid and not a methodological artefact"* (Jick, 1997, p. 602).

Now the research questions will be re-stated and then put to the test under these wide-ranging validity criteria.

Q1. What are the obstacles behind preventing Arabic speaking migrants from being online and having access to e-government in New Zealand?
Q2. What paralingual layout do the majority of Arabic speaking migrants prefer when browsing e-government in New Zealand?

Q3. What are the advantages of a paralingual e-government website in New Zealand for Arabic speakers?

Phase-1

The first phase of the quantitative data collection by the triangulation method, the online websurvey that was conducted using Facebook, provided information of a statistical and numerical nature that were useful in providing answers of a numerical nature to Q 1, Q 2 and possibly Q 3 - without knowing what are the real motives of the participants' answers and without giving detailed explanations for the participants' choices/selections.

Phase-2

The second phase of the quantitative data collection using triangulation method, the eye tracking experiment that was conducted with twenty-four participants, provided information predominantly to answer Q 2.

Phase-3

The third phase of the *qualitative data* collection using triangulation method, - the interviews that were conducted with the twenty-four participants who had participated in the eye tracking experiment - provided rich high quality information to answer possibly all three research questions and primarily Q 1 and Q 3, and adding more transparency to the previous two *quantitative data* collection.

The United States Aid International Development (2010) has stated six key steps of strategy, as shown in Table 38, that can be used as guidance for the triangulation method analysis.

Table 38 Triangulation Key Steps and Analysis Strategy

Key Steps in Deploying a Mixed-Method Evaluation Design and Analysis Strategy
"1. In order to determine the methods that will be employed, carefully review the purpose of the evaluation and the primary evaluation questions. Then select the methods that will be the most useful and cost-effective to answer each question in the time period allocated for the evaluation. Sometimes it is apparent that there is one method that can be used to answer most, but not all, aspects of the evaluation question."
The purpose of the online websurvey quantitative method was to test the general

opinion of a large population of the Arabic speaking population using a questionnaire regarding their preference for different paralingual webpage layouts. Certainly the online websurvey in Phase-1 provided three most preferred paralingual webpage layouts out of the six that were then used in the eye tracking experiment of Phase-2.
"2. Select Complementary methods to cover different aspects of the evaluation question (for example, the how and why issues) that the first method selected cannot alone answer, and/or to enrich and strengthen data analysis and interpretation of findings." This certainly was true in the interviews data collection of Phase-3 which the two quantitative methods in Phase-1 and Phase-2 cannot alone answer.
"3. In situations when the strength of findings and conclusions for a key question is absolutely essential, employ a triangulation strategy. What additional data sources and methods can be used to obtain information to answer the same question in order to increase the validity of findings from the first method selected?" The eye tracking method pinned down preferences; the interview following that helped reveal reasons for the preferences which then could be generalised to give grater validity.
"4. Re-examine the purpose of the evaluation and the methods initially selected to ensure that all aspects of the primary evaluation questions are covered thoroughly. This is the basis of the evaluation design. Develop data collection instruments accordingly." As part of the evaluation design, data collection tools were selected as part of the triangulation method in the planning of the early stages of the research.
"5. Design a data analysis strategy to analyse the data that will be generated from the selection of methods chosen for the evaluation." The data analysis strategy that was followed in analysing the data was to organise and categorise the data into coloured tables and main themes and sub-themes using coloured diagrams in order to easily identify all the variations within the collected data.
"6. Ensure that the evaluation team composition includes members that are well-versed and experienced in applying each type of data collection method and subsequent analysis." The evaluation team consisted of two supervisors who are very well experienced in conducting and supervising academic research, have approved the data collection and the subsequent analysis methods.

(United States Agency International Development, 2010, p. 2).

On the other hand, Jick (1997) uses a metaphor of the researcher using triangulation method - as a builder trying to put vital data pieces together in order to make sense as a whole to answer the research questions.

> *One begins to view the researcher as builder and creator, piecing together many pieces of a complex puzzle into a coherent whole. It is in this respect that the first-hand knowledge drawn from qualitative methods can become critical. While one can rely on certain scientific conventions (e.g., scaling, control groups, etc.) for maximizing the credibility of one's findings, the researcher using triangulation is likely to rely still more on a "feel" of the situation. This intuition and first-hand knowledge drawn from the multiple vantage points is centrally reflected in the interpretation* (Jick, 1997, p. 608).

7.3. The Online Websurvey

Section 4.8 titled 'Data Analysis and Findings of the Websurvey' provided an extensive analysis of different variables. This section contains a rapt and attentive summary of what has been presented in Section 4.8.

The online websurvey consisted of nineteen questions. Now is the point where their relevance to the research is identified, and to note down all the remarkable results obtained and analyse them.

Note that some of the figures mentioned in this Section are available in Chapter 4.

There were six layouts available to choose from on the online websurvey phase for the twenty nine participants who in the online websurvey:

Layout 1: line by line translation where the English language script is on top, and the Arabic translation below it. As shown in Figure 36.
Layout 2: line by line, where the Arabic translation is on top of the English script. As shown in Figure 37.
Layout 3: paragraph by paragraph English on top. As shown in Figure 38.
Layout 4: paragraph by paragraph, where Arabic translated paragraph is on top. As shown in Figure 39.
Layout 5: where the English script is on the right hand side and the Arabic translation is on the left hand side. As shown in Figure 40.
Layout 6: where the English script is on the left and the Arabic translation is on the right hand side. As shown in Figure 41.

Question 1 of the online websurvey asked the online participants to select their preferred paralingual webpage layouts. Figure 88 is the same as Figure 61, but Figure 88 has bars to present the data, instead of a pie as in Figure 61.
Figure 88 shows the online participants' preference for different paralingual webpage layouts.

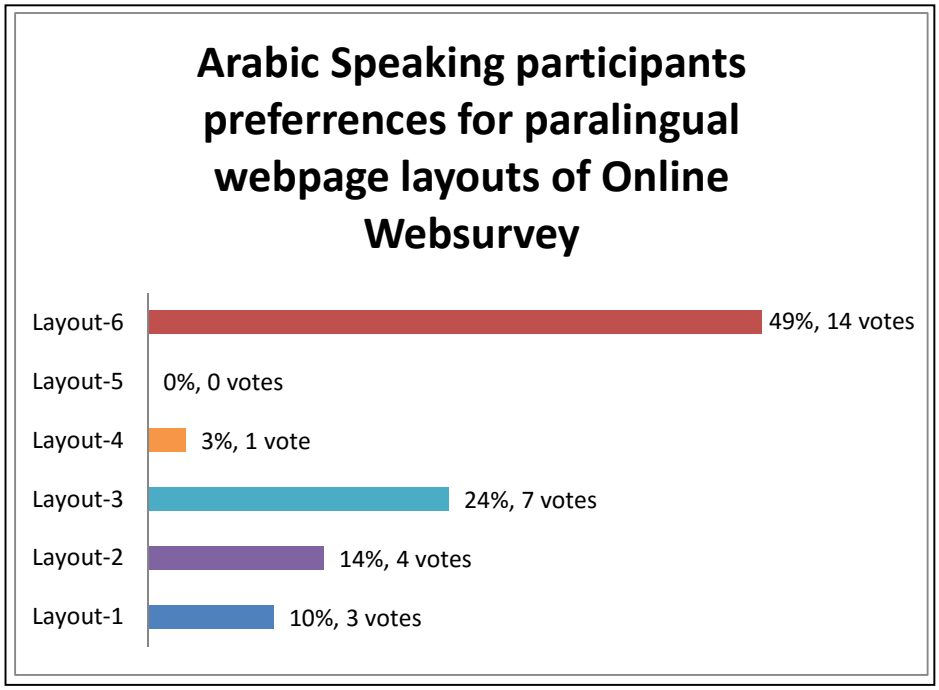


Figure 88 Arabic Speaking Participants Preferences for Paralingual Webpage Layouts of Online Websurvey

The results show that fourteen participants selected Layout 6; seven participants selected Layout 3; and four participants had selected Layout 2. These three layouts were by the online websurvey participants and they were implemented into the next, eye tracking, experiment phase.

The online websurvey phase was very useful in minimising the number of paralingual webpage layouts from six layouts to the three most preferred layouts for the next experiment. The following are the equivalent layouts from the online websurvey to the eye tracking layouts, as shown in Table 39.

Table 39 Equivalent Layouts of Eye Tracking and Online Websurvey Layouts

Eye Tracking Experiment Layouts	Online Websurvey Layouts
Layout 1<==========	==========>Layout 2
Layout-2<==========	==========>Layout 6

Layout 3<==========	==========>Layout 3

> *The use of complementary methods is generally thought to lead to more valid results, as noted. It is currently the archetype of triangulation strategies.*
> *Triangulation, however, can be something other than scaling, reliability, and convergent validation. It can also capture a more complete, holistic, and contextual portrayal of the unit(s) under study. That is, beyond the analysis of overlapping variance, the use of multiple measures may also uncover some unique variance which otherwise may have been neglected by single methods. It is here that qualitative methods, in particular, can play an especially prominent role by eliciting data and suggesting conclusions to which other methods would be blind. Elements of the context are illuminated.*
> *In this sense, triangulation may be used not only to examine the same phenomenon from multiple perspectives but also to enrich our understanding by allowing for new or deeper dimensions to emerge* (Jick, 1997, p. 603-604).

Elaborating on this insight of Jick (1997), the online websurvey first phase was very helpful in providing a general feedback to be implemented into the next two phases.

Figure 89 shows the following:

- Twenty four participants indicated that the paralingual webpage layout they had chosen as their preference was easy to read and understand in English and Arabic. Five participants indicated that their selection helped them learn new vocabulary.

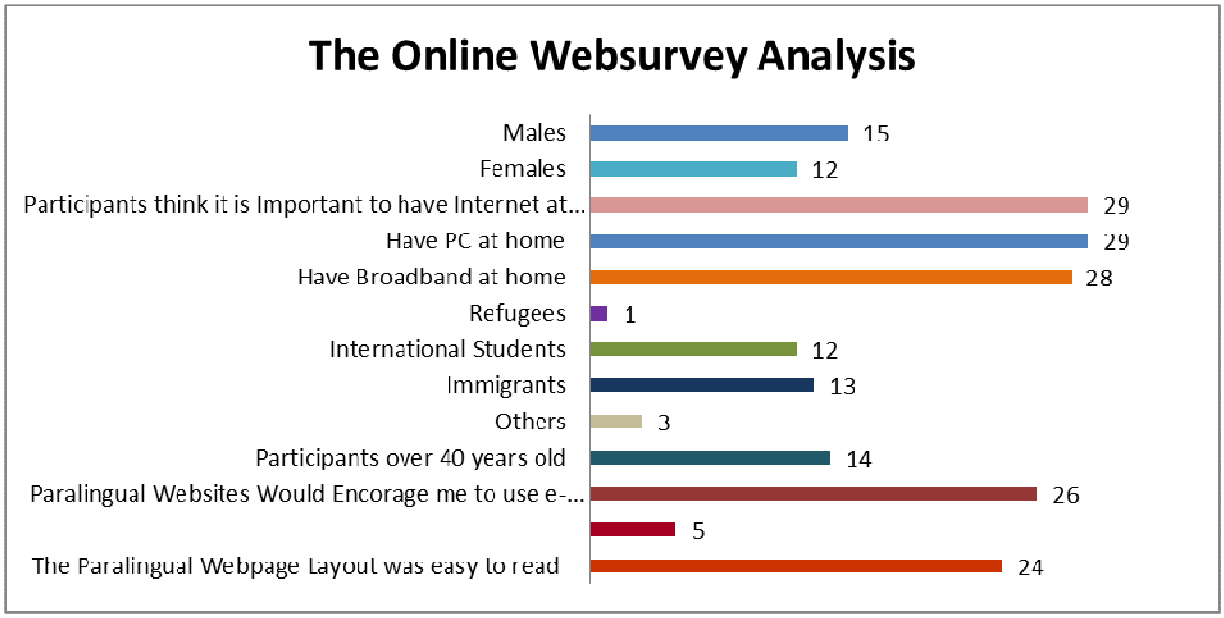


Figure 89 The Online Websurvey Analysis

- Twenty six of the twenty nine participants indicated that paralingual websites would encourage them to look for information and use e-government more often than in the present.
- Fourteen participants of the online websurvey were over forty years old; thirteen of the participants were immigrants, twelve participants were international students, three others and one participant was a refugee.
- Twenty eight participants have broadband at home, all participants believed that it is important to have Internet at home, and all participants have a personal computer at home. Hence this is an indication that most Arabic speakers do not have economic or technical issues when it comes to using the Internet.
- Fifteen males and twelve females.

The participation of twelve females in the online websurvey indicates that women are using the Internet enthusiastically and are not reluctant to participate in a survey.

7.4. The Eye Tracking

The second method of data collection was using an eye tracking experiment as a mean of quantitative data collection method. All the data results were presented in Chapter 5.

Validity and reliability are very important coefficients in quantitative research. Venkatesh, et al. (2013) were referring to Table 37 regarding quantitative validity.

> *Validity refers to the legitimacy of the findings (i.e., how accurately the findings represent the truth in the objective world)…there are three broad types of validity in quantitative research…(1) measurement validity (e.g., content and construct validity); (2) design validity (i.e., internal and external validity); and (3) inferential validity (i.e., statistical conclusion validity). Measurement validity estimates how well an instrument measures what it purports to measure in terms of its match with the entire definition of the construct* (Venkatesh, et al., 2013, p. 32-33).

The experiment consists of utilising an eye tracker to record each participant of the twenty four participants' performance and actions during each session. The technical specifications of the eye tracker are available in Appendix G. There were three webpages available for the participant to look at:

Webpage-1 consists of: Layout 1 on the left hand side, Layout 3 in the middle, and Layout 2 on the right hand side.

Webpage-2 consists of: Layout 2 on the left, Layout 1 in the middle, and Layout 3 on the right.

Webpage-3 consists of: Layout 3 on the left, Layout 2 in the middle, and Layout 1 on the right.

The data type collected in second phase was videos, and the unit of analysis was time in minutes. Each participant was asked to look at all three layouts (Layout 1, Layout 2 and Layout 3) on the three different webpages; they start reading through their preferred layout. Then the time spent on reading a certain layout on each webpage is totalled.

The data of each participant that was collected consisted of:

1. Measurement validity (content and construct validity): such as recording the activities of each participant during the eye tracking experiment.
2. Design validity (internal and external validity): such as the procedures that have been taken to set up the experiment, and
3. Inferential validity (statistical conclusion validity): like time spent reading each layout.

The results gave a direct answer to research question two. The data also revealed different reading patterns of each participant. Some participants took longer time to read through their preferred layout, while others took shorter time. Some participants looked up the translation of difficult words.

The results showed a relation between the time lived in New Zealand, the educational background, and the reading patterns. The participants who had spent only a shorter time in New Zealand and were still in the English language school took more time to read through their preferred layout and understand its content than the ones who had spent more time in New Zealand and were studying as full time students at the university.

Figure 90 shows the total results of the eye tracking experiment of all three webpages. Eight participants selected Layout 2, nine participants selected Layout 3, and seven participants selected Layout 1.

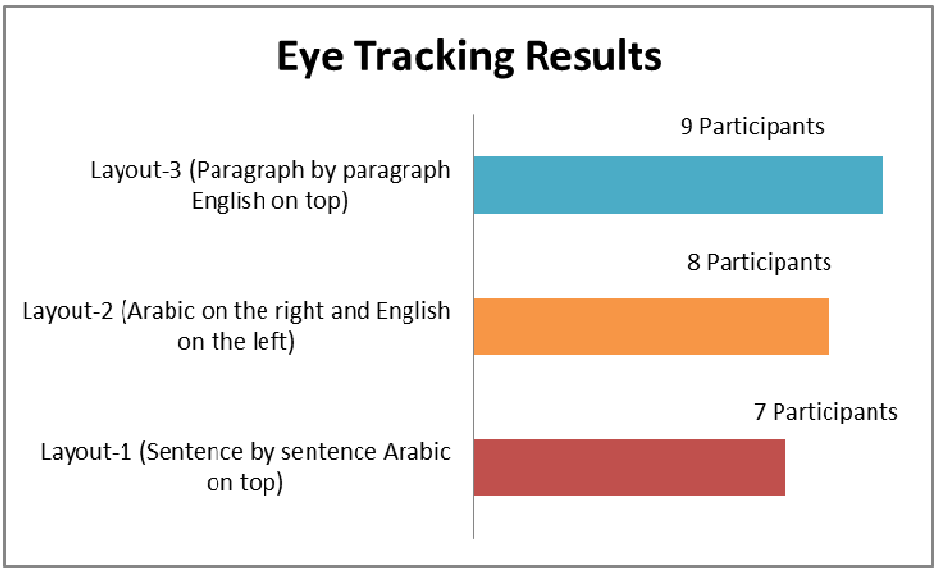


Figure 90 The Total Eye Tracking Results

Figure 91 shows the eye tracking results for Webpage-1. Seven participants selected Layout 1 placed on the left; six participants selected Layout 2 placed on the right; and eleven Participants selected Layout 3 placed in the middle.

The results of Webpage-1 indicate that most Arabic speakers looked at the middle of the screen.

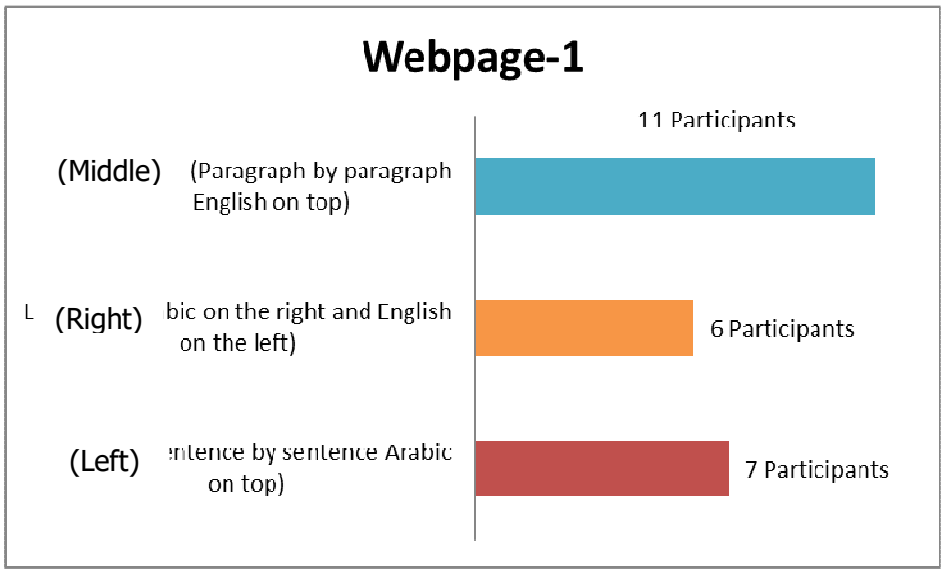


Figure 91 Eye Tracking Results of Webpage-1

Figure 92 shows the eye tracking results of Webpage-2. Six participants selected Layout 1; twelve participants selected Layout 2; and six participants selected Layout 3. The results here indicate that most participants have looked to the left of the screen to read Layout 2 as their preferred layout. Layout 2 was placed on the left, Layout 1 was placed in the middle, and Layout 3 was placed on the right of the screen.

The results of Webpage-2 indicate that most Arabic speakers looked to the left of the screen.

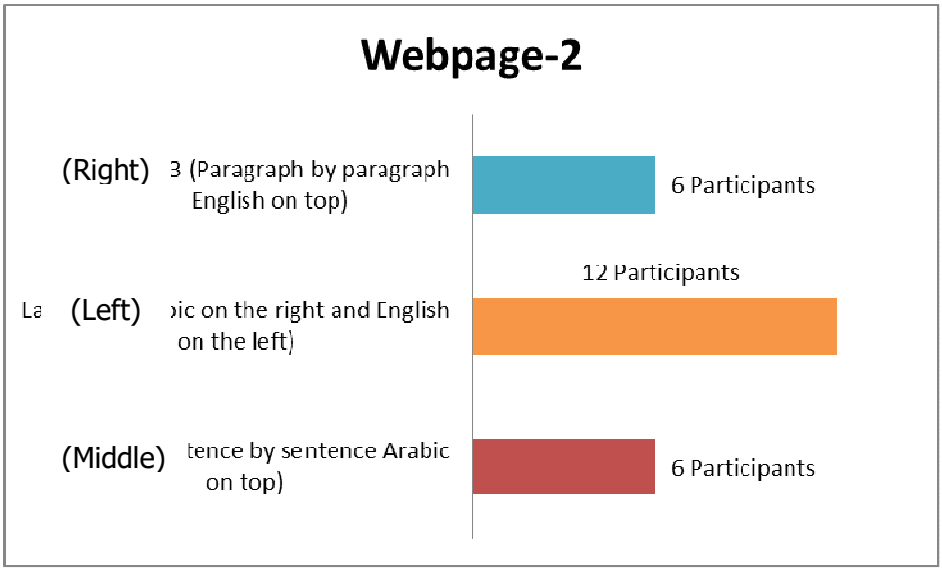


Figure 92 Eye Tracking Results of Webpage-2

Figure 93 shows the eye tracking results of Webpage-3 nine participants selected Layout 1 placed on the right; nine participants selected Layout 2 placed in the middle; and six participants selected Layout 3 placed on the left.

The results of Webpage-3 indicate that most Arabic speakers look at the middle of the screen.

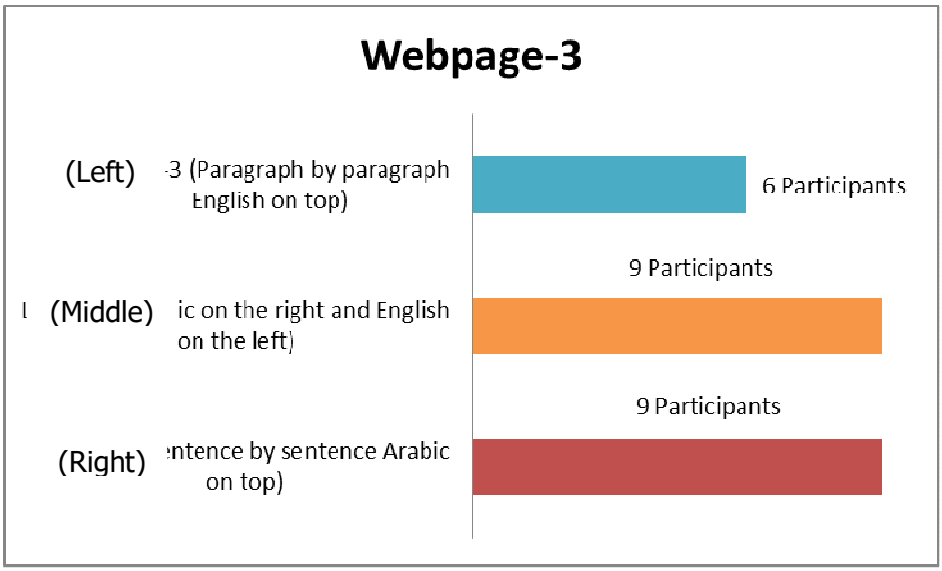


Figure 93 Eye Tracking Results of Webpage-3

The overall result of the three webpages indicates that there is no steady or constant pattern/configuration of where Arabic speakers are mainly focussed when looking at the screen.

Figure 94 shows more details that were produced and generated from the results collected from the eye tracking experiment.

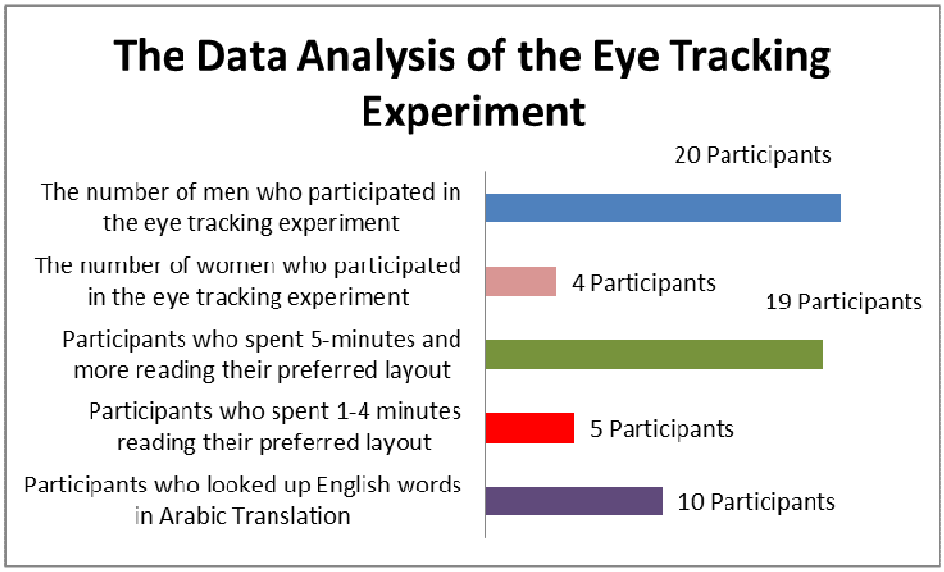


Figure 94 More Details of Eye Tracking Experiment

The participation of women in the eye tracking was noticeably low compared with the online websurvey. This could refer to Arabic speakers' characteristics and culture, related to religious beliefs - the fact that Muslim women are shy in dealing directly with the opposite sex. This was described in the literature review chapter and was mentioned in Section 2.2.

The quantitative data collection method using interviews gave more details about each of the participants, such as their education backgrounds and how that could be related to the data collected from the eye tracking experiment, such as the time spent reading the layouts and the need to lookup difficult English words in Arabic translation.

7.5. Interviews

This section delivers highlights and directs the lights on the eye tracking participants, in order to extend and encompass awareness and knowledge of the data collected about these participants.

The third phase of this research implemented a qualitative data collection method by using interviews. The twenty-four participants of the eye tracking experiment were

interviewed in order to extract more information related to each participant. The participants' actions during the eye tracking experiment, and their motivations, will be explained and understood more clearly.

Each participant was interviewed after he /she finished his/her eye tracking session. The questionnaire consisted of seventeen, questions available in Appendix C.

For analysis purposes the interview questions were coded, sorted, organised, and categorised into themes. It is very important to make sure that the themes answers the research questions like questions one and three. *"For qualitative data, coding often consists of sorting your data around certain recurring themes or topics that seem to come up…Make sure that each of your coding categories answers your research question in some way"* (Dublin Institute of Technology, 2000, p. 19).

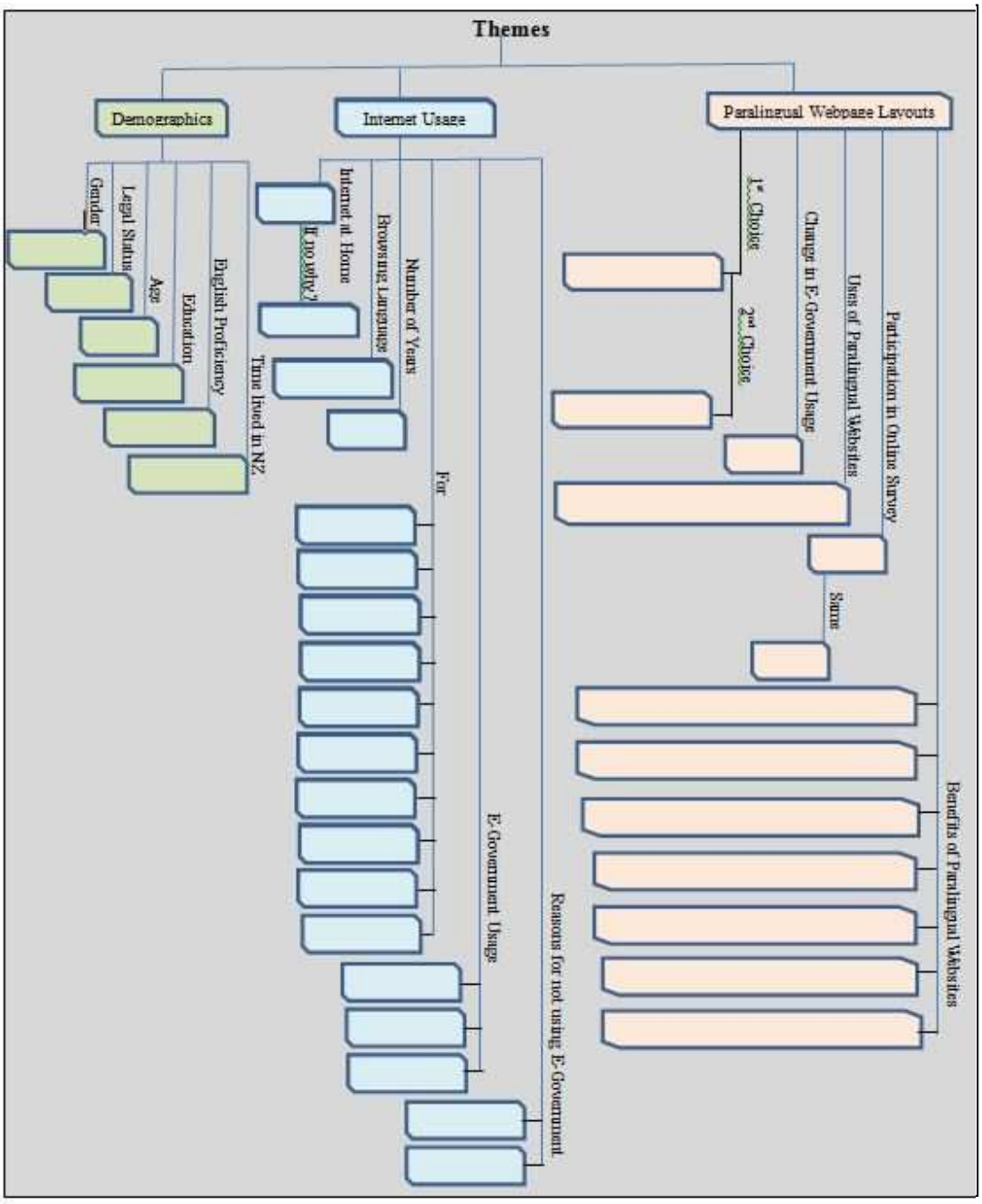
Thus the themes were structured into three main categories with their associate sub-themes. These platforms are going to fit in harmony and in accord together to produce findings to answer the research questions that in turn would draw conclusions that would produce and create recommendations that would be helpful for implementing localised provisions for the Arabic speaking community in New Zealand.

The summaries at the end of each main theme – demographics, Internet usage and paralingual webpage layouts - each resemble a piece of a main big block, with small blocks as subthemes. Then, when these big blocks are put together they will contribute to solving the puzzles that resemble the research questions.

The following are the themes and subthemes generated from the third phase:
1. Demographics: characterised into six subthemes; gender, legal status, age, education, English proficiency, and time lived in New Zealand.
2. Internet usage: characterised into six subthemes; Internet at home, browsing language, number of years using the Internet, Internet usage for, E-government usage, and reasons for not using E-government.
3. Paralingual webpage layouts: characterised into six subthemes; 1st choice, 2nd choice, likely to change in E-government usage, uses of paralingual websites, participation in online websurvey, and benefits of paralingual websites.

Figure 84 in Section 6.6 Chapter 6 showed themes and subthemes of the interviews used in the analysis process, using tree diagrams with different associated colours to make it easy to track these themes throughout Chapters 6 and 7. Tree diagrams of each of the participants are shown in Section 6.7. Powell and Renner (2003) mention a number of ideas for using themes and categorising the results that have been collected.

> *Once you sort the data, think about how the categories fit together and relate. What seems more important, less important? Are there exceptions or critical cases that do not seem to fit? Consider alternative explanations. Explore paradoxes, conflicting themes, and evidence that seems to challenge or contradict your interpretations. To trace connections, you can spread note cards across a table, use sticky notes on walls, or draw diagrams on newsprint showing the categories and relationships.* (Powell & Renner, 2003, p. 8).



(Figure 84 in Section 6.6) Themes and Subthemes of Interviews using Tree Diagram with the associated colours

7.5.1. Demographics

Demographics are the first of the main three themes of the interviews' data collection method with the following related six subthemes:

7.5.1.1. Gender

The first sub-theme of demographics is the participant's gender. The results show that twenty of the participants were males and four were females. This result indicates very low women participation in the eye tracking experiment; this low participation contradicts the high women participation for the online websurvey in Phase 1. Figure 95 shows the interview participants' gender.

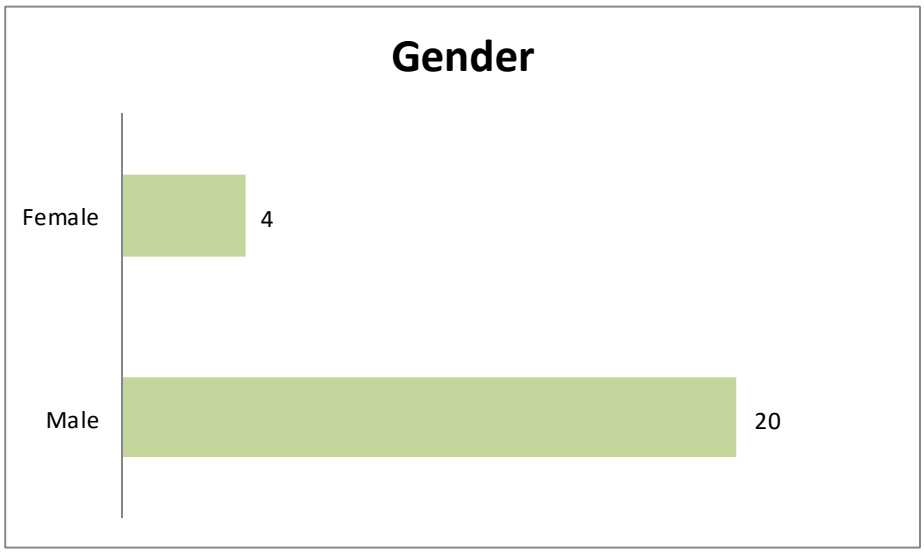


Figure 95 Interview Participants' Gender

7.5.1.2. Legal Status

Legal status was the second sub-theme of the demographics. Figure 96 shows that twenty one of the participants were international students; two of the participants were immigrants, and one participant had work permit status. The absence of refugees' participation was very obvious and disappointing, but the high participation of international students made up for it, because international students bear a resemblance to refugees with regards to English language proficiency (depending on the time spent living in New Zealand).

The reasons for the non-participation of refugees in the eye tracking experiment are twofold:

First, the unwillingness of the NGO which looks after refugees' concerns in Hamilton and is in charge of arranging contacts with refugees living there, to reveal their identity under any circumstances. This was to protect their privacy.

Second, there were no incentives or koha/gifts (such as gift vouchers) allowed by the university.

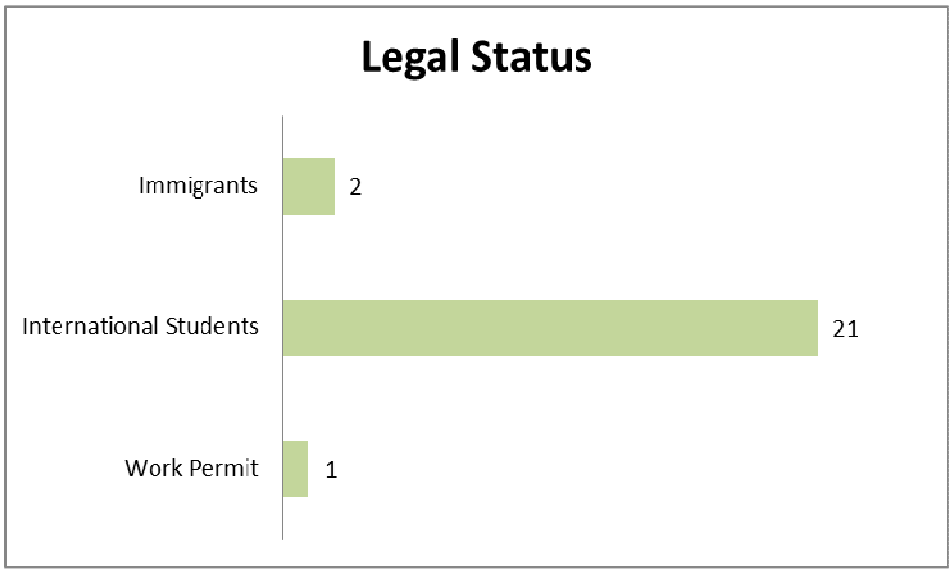


Figure 96 Interviews Participants' Legal Status

7.5.1.3. The Age

Figure 97 shows that eleven participants were 18-23 years old, six were 24-29, three were 30-35, one was 36-39, and three were 40 and up.

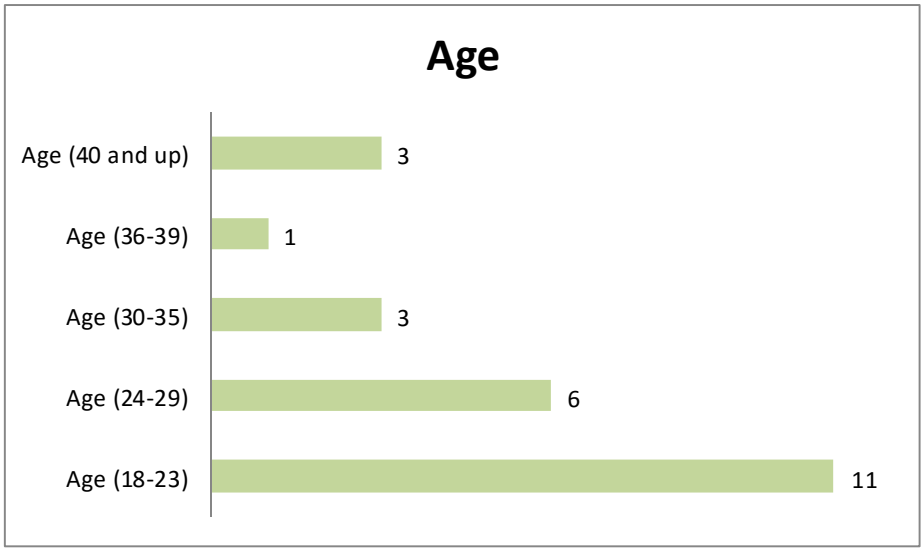


Figure 97 Interview Participants' Age

7.5.1.4. Education

Figure 98 shows that eleven participants have a high school degree and are students at an English Language School; eight are BS degree students; four have a Master degree; and one is a medical doctor. The results indicate that most of the participants were students at the English language school. Therefore a paralingual language would be very helpful to them.

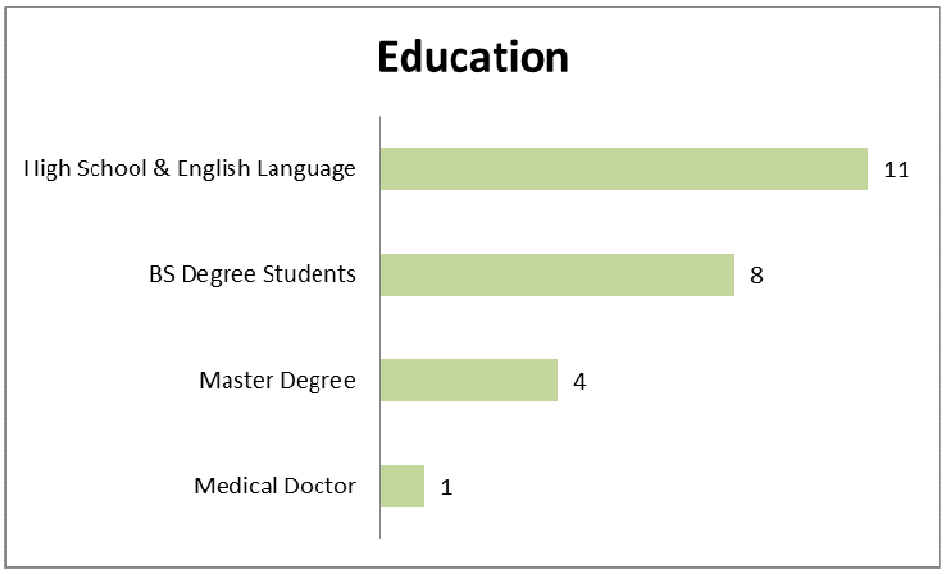


Figure 98 Eye Interviews Participants' Education

7.5.1.5. English Proficiency

Figure 99 shows that eleven participants have excellent English proficiency; eight have good English proficiency; and five participants have fair English proficiency. The results indicate that most of the participants' English language was above fair.

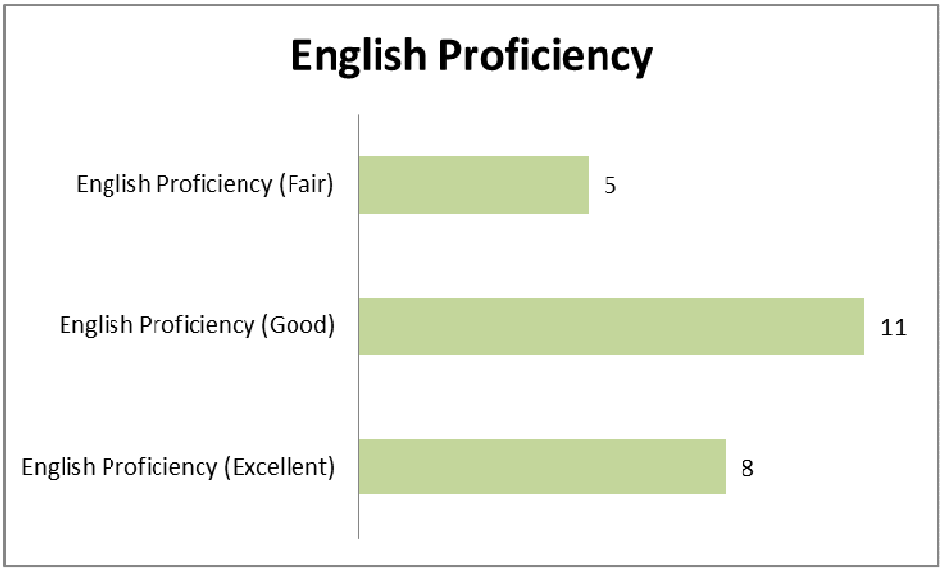


Figure 99 Interview Participants' English Proficiency

7.5.1.6. Time lived in New Zealand

Figure 100 shows that eleven participants have lived in NZ for 1-6 months, four for 6-12 months, six for 1-5 years, and three participants have lived here for 5-16 years.

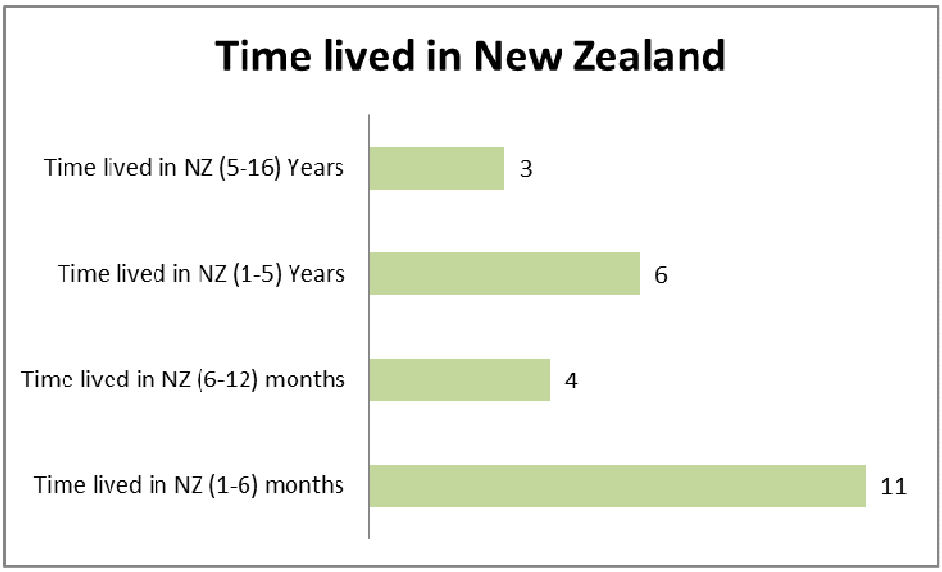


Figure 100 Interview Participants Lived in NZ

Thus the results of Figure 97 and Figure 100 indicate that most of the participants are less than thirty years old and have lived in New Zealand for one year or less.

7.5.1.7. Demographics Summary

The results of the subthemes of the above subsections of the Demographics Section are the first building block of information. They indicate that most of the participants

are males; international students; below thirty years old; still studying at an English Language School; have lived in New Zealand for one year or less. This sample represents most of the participants. They do not have family in New Zealand and their only way of getting settlements information is from the English language school or their friends.

7.5.2. Internet Usage

Internet usage is the second of the three themes of the interviews data collection method. It has these related six subthemes:

7.5.2.1. Internet at Home

Figure 101 shows that twenty three participants have Internet at home and only one participant does not - because he uses his 3G mobile phone to access the Internet. The results indicate that not all the participants have economic or technical issues preventing access the Internet at home.

7.5.2.2. Browsing Language

Figure 101 shows that eighteen participants use Arabic and English languages to browse the Internet; four participants use English; and two participants Arabic language to browse the Internet. The results indicate that most participants use both Arabic and English languages to browse the Internet - English language to access information in English and using Arabic language to access information in Arabic.

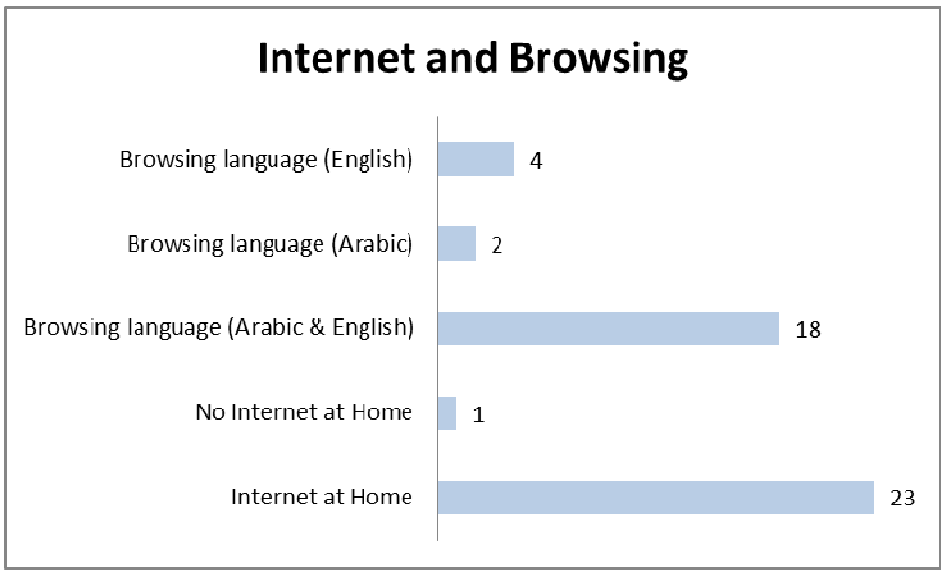


Figure 101 Participant Activities using the Internet

7.5.2.3. The Number of Years of Internet Usage

Figure 102 shows that fifteen participants have been using the Internet 6-10 years; and nine participants have been using the Internet 11-18 years. The results indicate that most of the participants have been using the Internet at their home countries before coming to New Zealand (based on the analysis in Section 7.5.1.4 time lived in NZ).

7.5.2.4 Internet Usage For (Purpose of Using the Internet)

The following are the options for Internet usage that the participants had available to choose from.

☐Email ☐Internet browsing ☐Communicating with family members overseas ☐News ☐Map directions ☐Ticket reservation ☐Legal information & issues ☐ Employment ☐Entertainment such as music & movies☐ Education ☐Internet banking

Figure 102 shows that fourteen participants have selected some of the options; and ten participants have selected all the options for Internet usage. This indicates that all of the participants have at least selected some of the reasons for browsing the Internet.

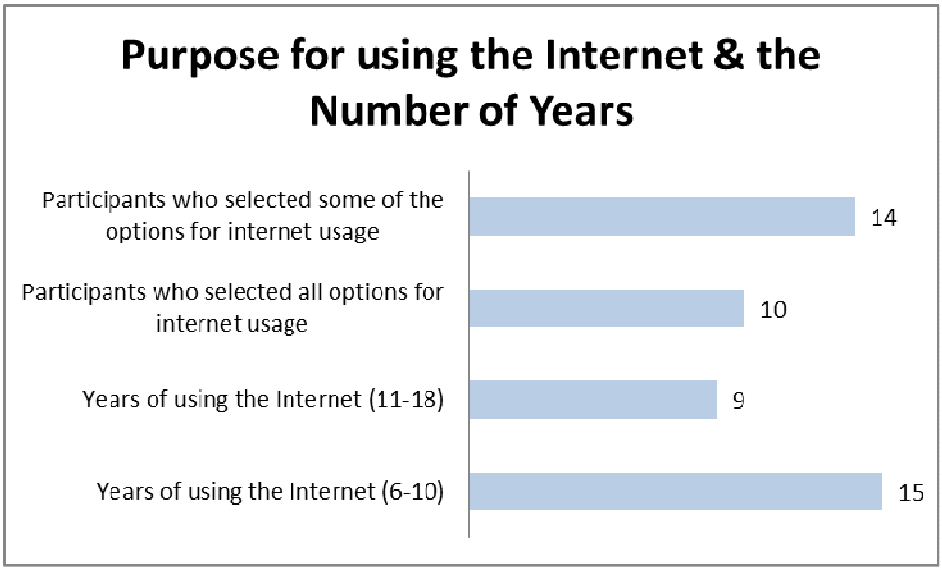


Figure 102 Purpose for Using the Internet and the Number of Years

7.5.2.5. E-government Usage

Figure 103 shows that sixteen of the participants have used the E-government website; and eight have not used it. During the interviews some of the participants

who had used E-government (mostly students), revealed that they had used it to sort out legal matters with local Consulate of their country. Others who had used NZ E-government, used it to pay fines or to renew their student visa.

7.5.2.6. Reasons for Not Using NZ E-government

Figure 103 shows that fourteen of the participants were not using NZ E-government because of the English language barrier; three not using it because they were unaware of the information available; and sixteen participants used NZ E-government. The results indicate that at least nine participants used their local Consulate's E-government. The results also indicate that more than half of the participants have an English language barrier that prevented them from accessing NZ E-government.

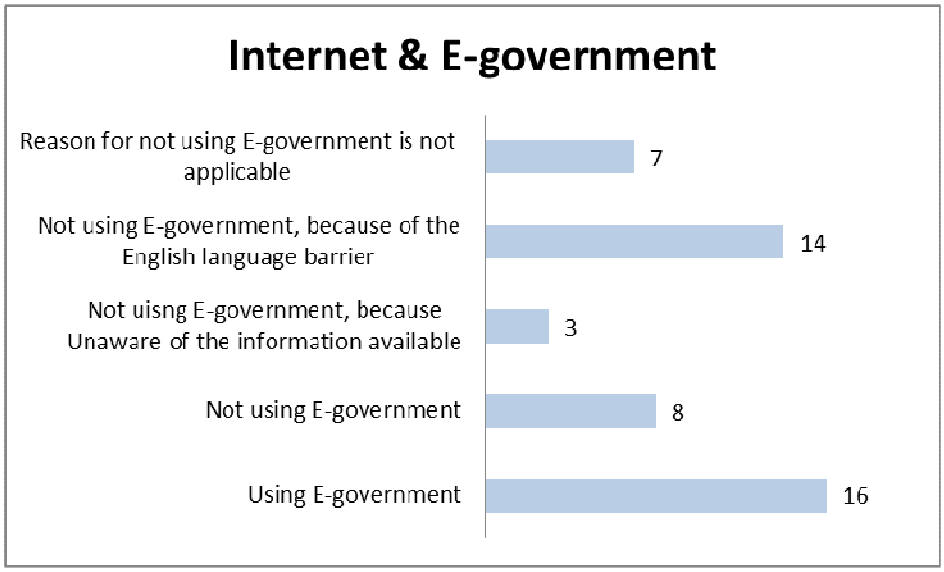


Figure 103 E-government Usage and Reasons for Not Using E-government

7.5.2.7. Internet Usage Summary

The results of the Internet usage Section is the second building block of information. It indicates that although all but one of the participants have Internet at home; and that most participants are very active on the Internet and use it for more activities and uses; and that most participants use the Internet more than six times per year; and yet most participants *were not using NZ E-government website*, because of the English language barrier.

7.5.3. Paralingual Webpage Layouts

Paralingual webpage layouts are the final and third of the main three themes of the interviews data collection method. With the following related six subthemes:

7.5.3.1. 1st Choice Paralingual Webpage Layout

Figure 104 shows that ten participants selected Layout 2 (Arabic on the right and English on the left) as their 1st choice paralingual webpage layout; eight participants selected Layout 3 (Paragraph by paragraph English on top); and six participants selected Layout 1 (Sentence by sentence Arabic on top). The results possibly indicate that most participants' 1st choice of paralingual is because felt most comfortable and easy to read and logical to them, because the Arabic language is written and read from right to left.

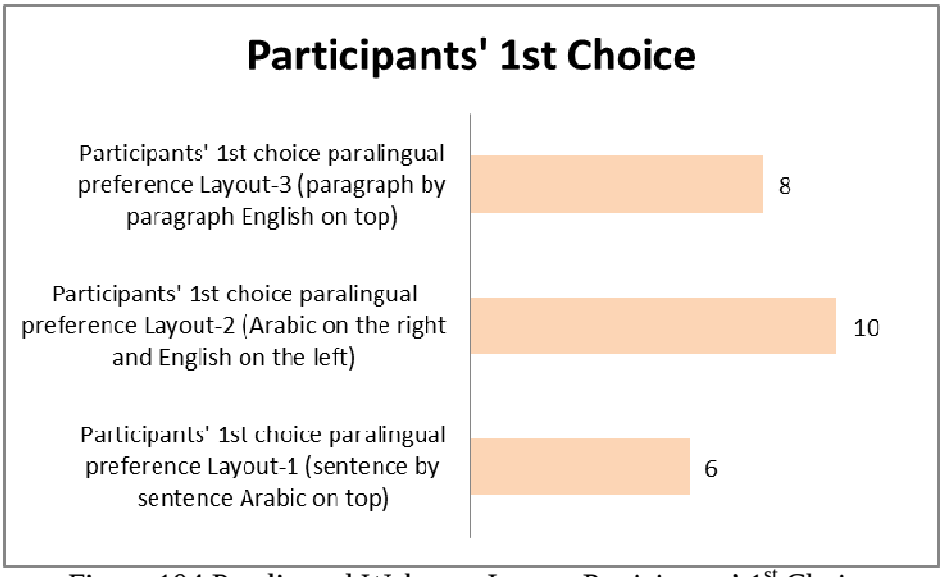


Figure 104 Paralingual Webpage Layout Participants' 1st Choice

7.5.3.2. 2nd Choice Paralingual Webpage Layout

Figure 105 shows that nine participants selected Layout 2 (Arabic on the right and English on the left) as their second choice; six participants selected Layout 3 (Paragraph by paragraph English on top); three participants selected Layout 1 (Sentence by sentence Arabic on top); and six participants did not make a 2nd choice selection. The results show that Layout 2 (Arabic on the right and English on the left) is the preferred 2nd choice as well as the preferred 1st choice.

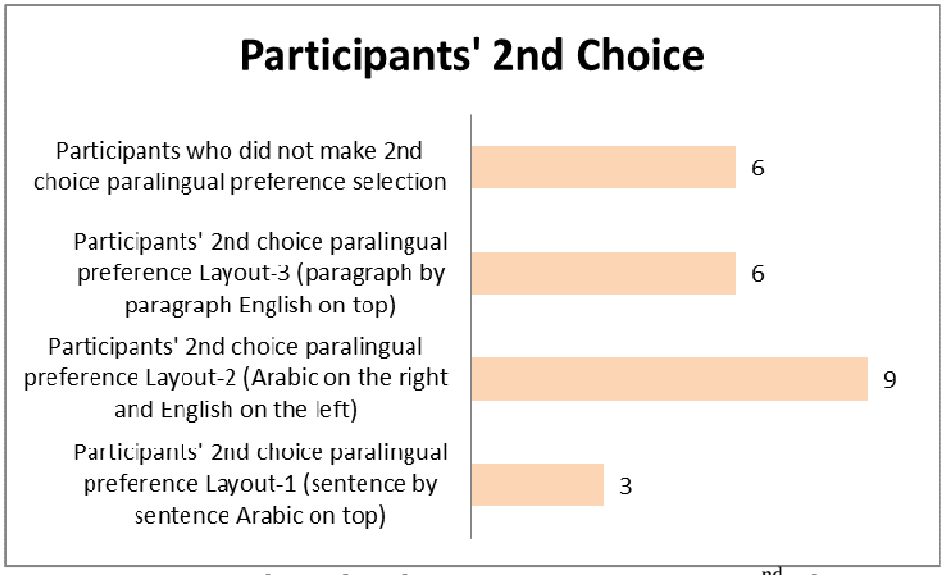


Figure 105 Paralingual Webpage Layout Participants' 2nd Choice

7.5.3.3. Likely to Change in E-government Usage

Figure 106 shows that twenty one participants would access E-government more often if paralingual websites were available; and three participants revealed that paralingual websites would not make any difference. The results indicate that paralingual websites would increase Arabic speakers' access to E-government.

7.5.3.4. Uses of Paralingual Websites

Figure 106 shows that fourteen participants thought that paralingual websites are easier to read; and eight participants thought that paralingual websites would help in the translation of difficult words.

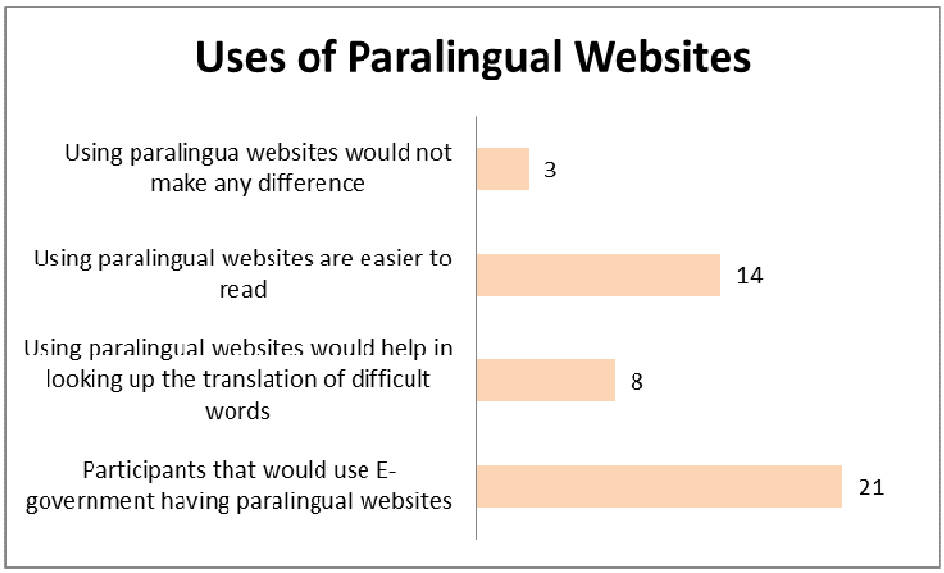


Figure 106 Uses of Paralingual Websites

7.5.3.5. Participation in Online Websurvey

Two participants took part in both the online websurvey and the interviews. One of them made the same selection of preferred layout, while the second participant did not recall the selection made in the online websurvey.

7.5.3.6. Benefits of Paralingual Websites

The following are the benefits of paralingual websites offered to the participants to select:

☐ Employment search ☐ Access e-government more often ☐ Create trust in the government ☐ Could be used as an educational tool ☐ Provide newcomers with important information ☐ Saves time when looking for important information ☐ Other

Figure 107 shows that twenty three participants thought that paralingual websites would create trust in the government; twenty three participants also thought that paralingual websites would be used as an educational tool; and twenty two participants thought that paralingual websites would provide newcomers with important information.

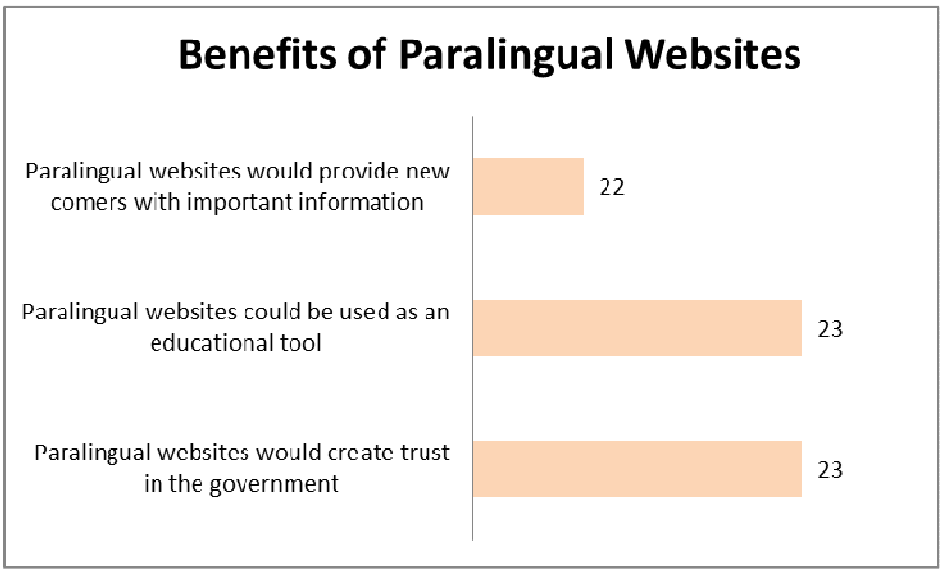


Figure 107 Benefits of Paralingual Websites

7.5.3.7. Paralingual Webpage Layouts Summary

The results of the paralingual webpage layouts are the third and final building block of information. Most participants preferred Layout 2 (Arabic on the right and English on the left); most participants were in favour of paralingual websites; most

participants thought that paralingual websites could be used as an educational tool; most thought that they would create more trust in the NZ government; and that they would provide newcomers with important information.

7.6. Chapter Seven Summary

Section 7.2 is a discussion of the triangulation and mixed methods.
Section 7.3 describes the online websurvey analysis.
Section 7.4 covers the eye tracking experiment analysis.
Section 7.5 summarises the results of the participants' interviews.

7.7. Next Chapter

The next chapter is Chapter 8 - Discussion and Findings - consists of the following: the objective of this research; revisiting the literature review; research questions' answers; interpretation of the results; limitations; and further research.

Chapter Eight: Discussion and Findings

8.1. Introduction

This chapter is structured and organised into two parts, the first part the discussion (8.2) and the second the findings (8.3). These two parts are organised into two main Sections that contains interpretation and description of the research results.

The discussion of the research includes explanation of the results; analysis of unexpected findings and unusual patterns and their meanings; references to previous research and comparing this research's results with the findings of key sources already mentioned in the literature; identifying potential limitations and weaknesses and their impact on interpretation; an interpretation of how the results can be useful in answering the research questions; recommendation for further research; and justification of why the findings are significant and how they could be applied in wider understanding of the research problem and how this in turn could add to our knowledge of the research topic (University of Southern California, 2014). *"The discussion Section gives you an opportunity to explain the meaning of your results. When writing the discussion, remember that the focus should be to help the reader understand the study and that the highlight should be on the study data"* (Hess, 2004, p. 1241).

The second part of the chapter covers the findings of this research - all the results of the three research methods (a triangulation) categorized into three research methods: online websurvey, the eye tracking experiment, and the participants' interviews following the eye tracking experiment.

After gathering data from surveys, experiments or interviews it is a good practice to write the results well instead of presenting the original results, in particular the results and the discussion Section that are sometimes called findings or simply results (Chan, 2009).

"Reporting data involves more than just presenting it. Often, you need to interpret or analyse the data, that is, say what it means, especially in relation to your research question" (Chan, 2009, p. 29).

8.2. Discussion

The objective of the discussion is to announce explanations and; sentiments; and clarify the associations and effects of the findings. Its main purpose is to provide answers to the research questions and make explanations available as to how the research results support these answers and how the answers are acceptable to support and add to the present day knowledge.

One way to organise and categorise the issues that need to be covered in the discussion Section is to use an issue tree. The issue tree is a tool used to provide an inclusion on the discussion that summarises the research philosophy, method, and results (Rasiel, 1999).

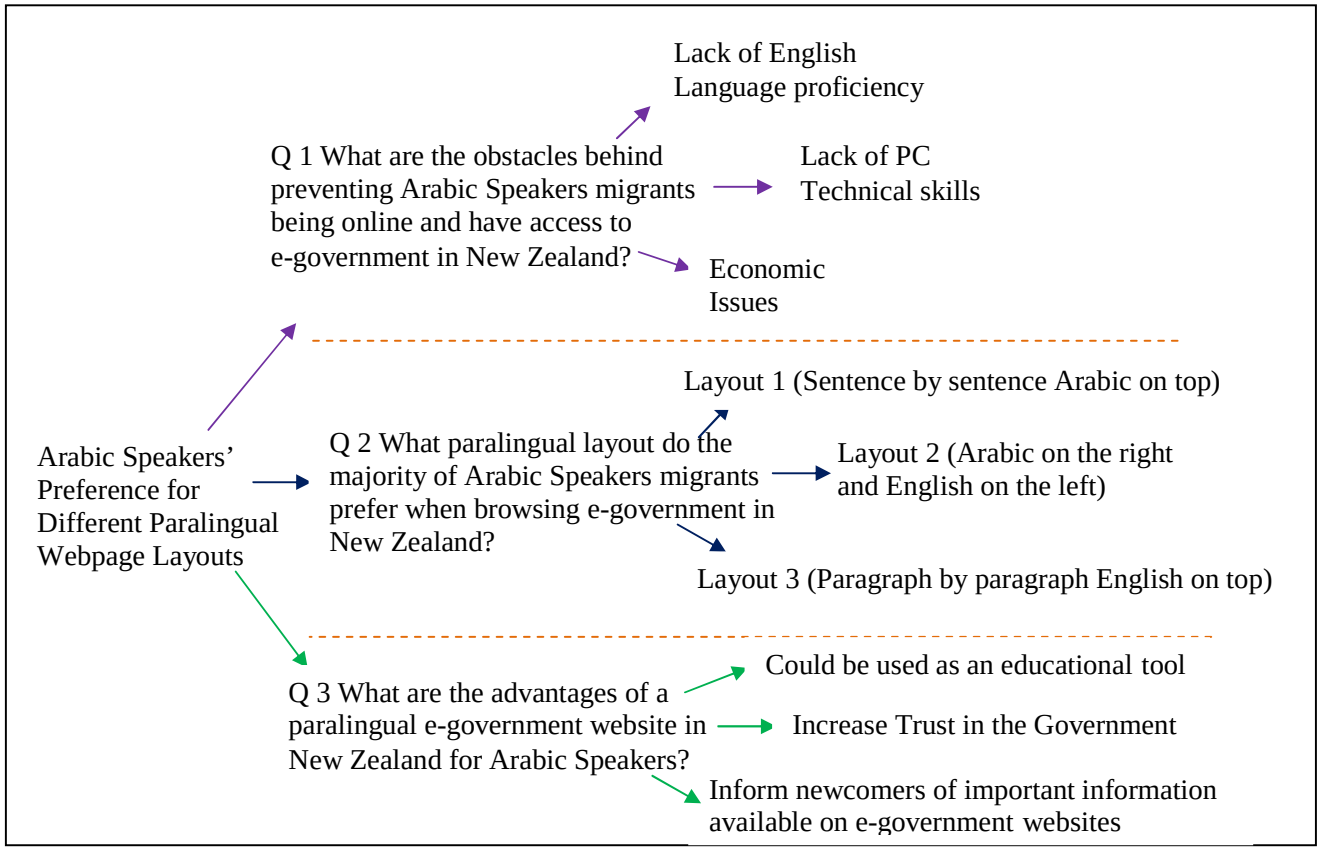


Figure 108 An Issue Tree of this Research

Figure 108 shows the important issues that were investigated in this research to answer the main three research questions.

Table 40 shows the research questions and the corresponding research method/methods that were implemented to answer them:

Table 40 The Research Questions and the Corresponding Method/Methods

Research Questions	Corresponding Method/Methods Used
Q 1. What obstacles prevent Arabic speaking migrants from being online and having access to e-government in NZ?	1) The online websurvey; and 2) The participants' interviews.
Q 2. What paralingual layout do the majority of Arabic speaking migrants prefer when browsing e-government in NZ?	1) The online websurvey; 2) The eye tracking experiment; and 3) The participants' interviews.
Q 3. What are the benefits of a paralingual e-government website in NZ for Arabic speakers?	1) The online websurvey; and 2) The participants' interviews.

The advantage of using mixed methods is the integrity and credibility of the results. The use of more than one method to answer the research questions will lead to clearer interpretations of the results of the data collection. Plano Clark, Huddleston-Casas, Churchill, Green and Garrett (2008) mention four mixed methods designs: triangulation design, explanatory design, exploratory design and embedded design. They are shown in Figure 109, Figure 110, Figure 111 and Figure 112.

The triangulation design was used to merge the results of the online websurvey of using six different paralingual webpage layouts to be refined into three most preferred layouts to be merged and interrelated in order to be used in the eye tracking experiment as shown in Figure 108. Subsequently, triangulation design was also used in the eye tracking experiment results and the participants' interviews results. On the other hand, the embedded design was another mixed methods design that was used when interviews were used to enhance the eye tracking results as shown in Figure 112.

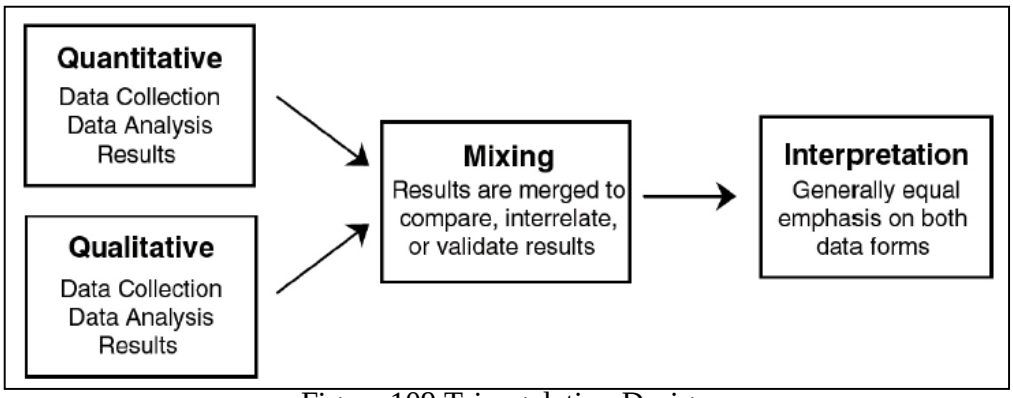


Figure 109 Triangulation Design
(Plano Clark, Huddleston-Casas, Churchill, Green, & Garrett, 2008, p. 1551)

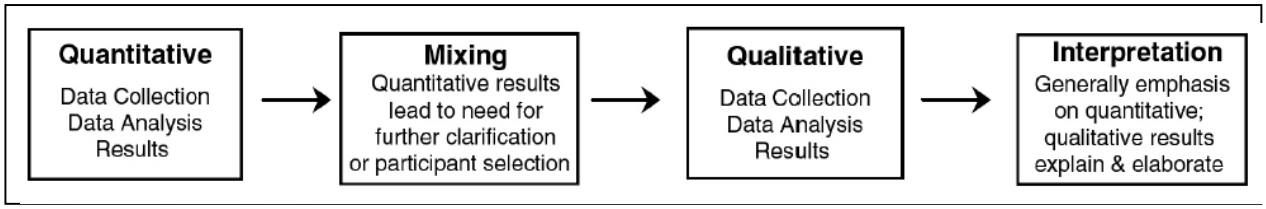


Figure 110 Explanatory Design
(Plano Clark, et al., 2008, p. 1551)

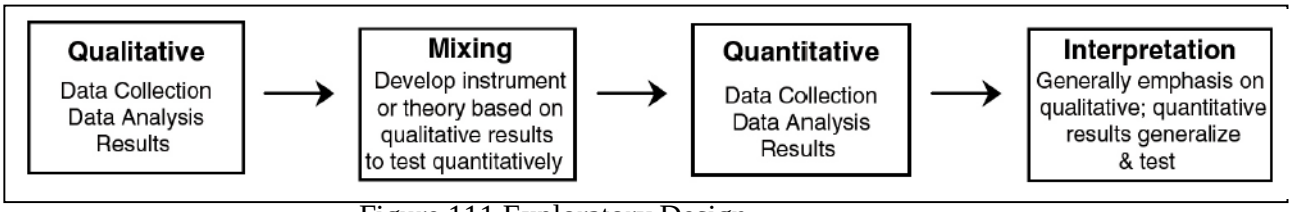


Figure 111 Exploratory Design
(Plano Clark, et al., 2008, p. 1551)

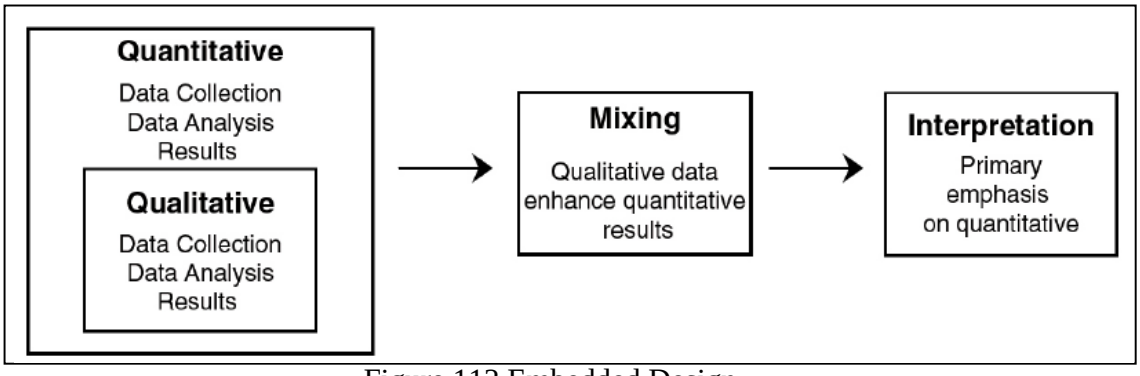


Figure 112 Embedded Design
(Plano Clark, et al., 2008, p. 1551)

Concurrently Kretchmer (2008) narrated fourteen guideline steps for writing an effective discussion Section. Table 41 shows these fourteen steps leading to guidelines for the following subsections.

Table 41 Guidelines of Writing a Discussion Section

Fourteen Steps to Writing an Effective Discussion Section
1. Organize the Discussion from the specific to the general: your findings to the literature, to theory, to practice.
2. Use the same key terms, the same verb tense (present tense), and the same point of view that you used when posing the questions in the Introduction.
3. Begin by re-stating the hypothesis you were testing and answering the questions posed in the introduction.
4. Support the answers with the results. Explain how your results relate to expectations and to the literature, clearly stating why they are acceptable and how they are consistent or fit in with previously published knowledge on the topic.
5. Address all the results relating to the questions, regardless of whether or not the findings were statistically significant.
6. Describe the patterns, principles, and relationships shown by each major finding/result and put them in perspective. The sequencing of providing this information is important; first states the answer, then the relevant results, then cite the work of others. If necessary, point the reader to a figure or table to enhance the "story".
7. Defend your answers, if necessary, by explaining both why your answer is satisfactory and why others are not. Only by giving both sides to the argument can you make your explanation convincing.
8. Discuss and evaluate conflicting explanations of the results. This is the sign of a good discussion.
9. Discuss any unexpected findings. When discussing an unexpected finding, begin the paragraph with the finding and then describe it.
10. Identify potential limitations and weaknesses and comment on the relative importance of these to your interpretation of the results and how they may affect the validity of the findings. When identifying limitations and weaknesses, avoid using an apologetic tone.
11. Summarize concisely the principal implications of the findings, regardless of statistical significance.
12. Provide recommendations (no more than two) for further research. Do not offer suggestions which could have been easily addressed within the study, as this shows there has been inadequate examination and interpretation of the data.
13. Explain how the results and conclusions of this study are important and how they influence our knowledge or understanding of the problem being examined.
14. In your writing of the Discussion, discuss everything, but be concise, brief, and specific.

(Kretchmer, 2008, pp. 1 & 2)

8.2.1. The Objective of this Research

The theme of this research is about reducing the digital divide of the migrants (refugees and immigrants) in Hamilton, New Zealand, society as the segment under study. It took three years to plan this research - deciding the methodology, the subjects under study and the methods used for data collection.

The World Summit on the Information Society (WSIS) is going to be held in 2015 named "Millennia 2015", was preceded by two phases in 2003 and 2005:

> *The World Summit on the Information Society (WSIS) was held in two phases. The first phase took place in Geneva hosted by the Government of Switzerland from 10 to 12 December 2003, and the second phase took place in Tunis hosted by the Government of Tunisia, from 16 to 18 November 2005* (International Telecommunication Union, 2014, p. 1).

Millennia 2015 aims to have some answers to the digital divide related to gender, politics, economy, society, education and cultural. Millennia 2015 will add to the accomplishment of the United Nations' Millennium Development Goals and to the 'Tunis Agenda for the Information Society' agreed to by the WSIS (International Telecommunication Union, 2014).

Thus the carrying out and the implementation of this research will contribute to providing answers to the digital divide related to issues that newcomers may face regarding access to e-government and the Internet. And if implemented, it will provide Arabic speakers with the design they themselves prefer for a paralingual webpage layout that would then enable them to get access to vital information available on the governmental websites.

The decision to select mixed methods as the best methodology for this research was made with consultation of the research supervisors. There were three major research methods used for data collection: the online websurvey, the eye tracking experiment and the participants' interviews following the eye tracking experiment.

The reason for choosing Hamilton residents as the subjects under study was due to the available eye tracking facilities at The University of Waikato in Hamilton. However a limitation on the refugees' and immigrants' participation in the eye tracking experiment and the interviews following it, partly because the researcher is not a resident of the Hamilton area, and partly the refusal due to Waikato Migrant Resource Centre, who are partners in Refugee Services Aotearoa, to release migrants' contacts under the pretext of protecting the Migrants Privacy Act.

This research is designed to investigate Arabic Speakers' preference for different paralingual webpage layouts, in order to *assist* migrants and newcomers to get access

to important information that are available on e-government websites in New Zealand. This provision would help to reduce and decrease what is known as the digital divide in New Zealand society among migrants.

Segovia, Jennex, and Beatty (2009) mention that a paralingual layout is known to be a web design methodology for presenting more than one language on the same webpage. Paralingual website provision is a recognised as a form of a localization process where a product or service is modified to accommodate local needs.

It is also important to note that the term paralingual was criticized by some scholars in the Computer Science Department at The University of Waikato in Hamilton, because the term paralingual is not commonly used in webpage layouts. On the other hand, the Wiki Answers (2013) describe paralingual communication as the words' *sound*, such as accent, time of voice, and speed of speech. This point was mentioned in the preface Section at the beginning of this thesis.

8.2.2. This Research's Knowledge in Accord with the Literature Review

This research will add to our knowledge of Arabic speakers' preference for different paralingual website layouts, since there has been minimal discussion on Arabic web page layouts, and there has been no mention of Arabic speakers' preferences and their implications in the literature. Therefore, this research adds to our knowledge of the preferences of Arabic speakers of paralingual web page layouts. The following references are the main articles from which this research draws its epistemological content:

1. Paralingual Web Design Methodology

I. The Expression "Paralingual"

Segovia et al. (2009) provide a coined definition for the word "Para-lingual" from the word "Bi-lingual", or "Tri-lingual" where the prefixes "Bi" and "Tri" means two and three respectively. Similarly, "Para" is the Greek prefix that means beside, near or alongside.

On the other hand, the first trilingual/paralingual design discovered so far is the scripts on the Rosetta or Rashid stone in Egypt as was mentioned in the preface: the

scripts are in Hieroglyphic, Demotic and Greek. It was made in 196 B.C., found by French archaeologists in 1799, and deciphered by Champollion in 1822. He used Greek and Demotic scripts that he was able to read and understand (British Museum, 1999). It also seems that Champollion used the paralingual design presented on the Rashid stone as an educational tool by using the Greek and Demotic scripts to translate or decipher the Hieroglyphic script.

Figure 113 shows a paralingual layout of two languages, Egyptian and Greek, with three scripts: Hieroglyphic, Demotic, and Greek it resembles Layout 3 of the eye tracking experiment, where the paralingual design is presented paragraph by paragraph.

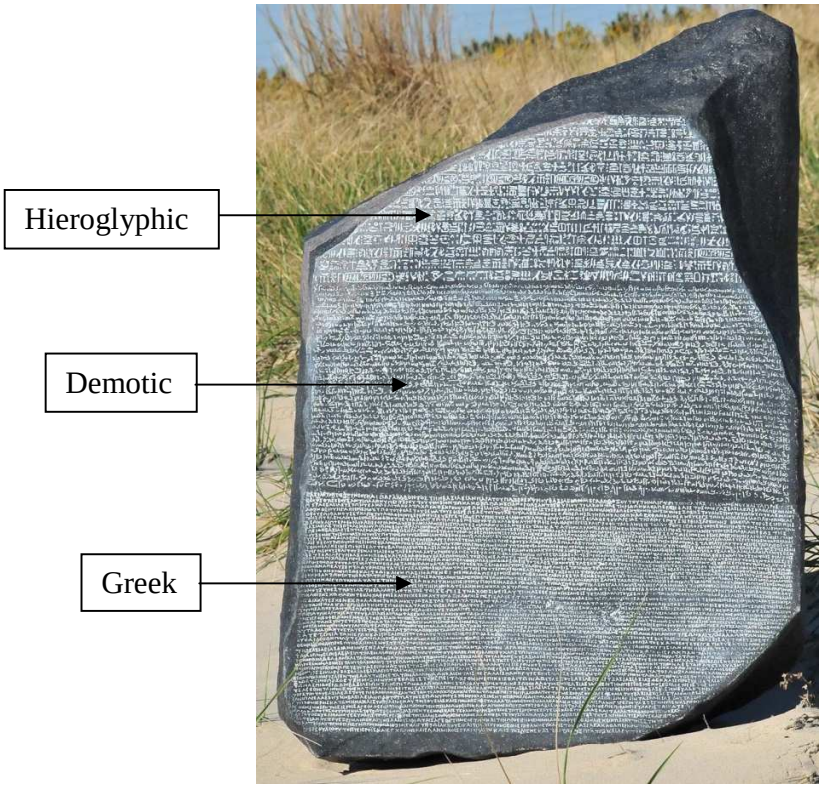


Figure 113 Rosetta or Rashid stone
(British Museum, 1999, p. 1)

II. The Methodology, Results and Analysis

Segovia et al. (2009) implemented a paralingual web design methodology for Spanish speakers in California, USA, using Spanish and English languages. Their article provided support both for government decision makers, and for e-government web designers. An e-government web page was transformed to a paralingual layout, and

then the participants were categorised into two groups: minority language speakers, and majority language speakers. Both were surveyed for the content and readability. The results showed that trust was enhanced among the minority language speakers, while trust stayed neutral among the majority language speakers. With regards to the readability, neither group specified any major fall-of or difficulties in reading paralingual web layouts. Table 42 shows the differences and similarities between this research and that of Segovia et al. (2009).

Table 42 Differences and Similarities between this Research and that of Segovia et al. (2009)

Category	Segovia et al. (2009)	This Research
Aim	The article propositions that paralingual web design could endure trust issues using e-government with bilingual speakers.	Test Arabic speakers' preference for different paralingual web page layouts.
Participants	Minority language speakers and majority language speakers.	Arabic speakers' consisting of: international students and migrants and 1 refugee.
Paralingual layout	English and Spanish side by side.	English and Arabic presented in different layouts.
Methodology	This research used three informational web pages that were changed to paralingual layouts consisting of English and Spanish placed horizontally adjacent to each other. A quantitative approach, using a survey monkey for data collection was used.	This research used different paralingual web page layouts, starting with six layouts in the online web survey, the results leading to using the three preferred layouts in the eye tracking experiment. This research used mixed methods: 1. An online web survey; 2. An eye tracking experiment; and 3. Participants' interviews.
Results	Trust was enhanced among the minority language speakers, but remained neutral among the majority language speakers. On the other hand there were no signs of difficulties in the readability of the paralingual layout.	There were three sets of results - from the online web survey, the eye tracking experiment and the participants' interviews. The online web survey showed that the majority of Arabic speakers preferred the Arabic

		translation on the right and the English text on the left. There were also analytic information such demographic, male/female, and participants' familiarisation of technical and Internet knowledge. The eye tracking results also showed that the majority of the participants were drawn to that same layout. Equal numbers were drawn to the Arabic translation on the right and the English text on the right layout, to the English text on top and the Arabic translation beneath it. The experiment also provides participants' reading characteristics. The interview results also showed that the majority selected the Arabic translation on the right and the English text on the left; and that some of the participants' selections of paralingual layouts during the interviews were in contrast with their selection of paralingual layouts in the eye tracking experiment. In addition these were upshots such as the participants' demographics, Internet usage, and the advantages of paralingual layouts.
Analysis	Quantitative analysis tools were used such as the Mann-Whitney U test, and the Wilcoxon T test.	The results were organised into pie charts, tables, and diagrams, then they were analysed.

2. Arabic Speakers' Characteristics

The Arabic migrants' aspects characteristics consist of both cultural and the language aspects. Both of these characteristics influence the behaviour of Arabic speakers in the society they live in. The language characteristics are described in Section 2.2.1,

the cultural characteristics in Section 2.2.2. They are in the literature review chapter. The Arabic language characteristics covered in the literature will be discussed and debated with the ones revealed by this research. On the other hand the cultural characteristics that Kardi (2009) mentioned with regards to Muslim women restraints and their effects on participation will be discussed in the findings Section 8.3.

Fuchs (2008) and Gray and Elliott (2001) mention four issues that would have an effect on migrants and newcomers: economic, social, cultural and political for both on short and long term integration. This is discussed in detail in Section 1.6.

One of the articles that discuss the Arabic language characteristics in the literature review is by Abdelali (2004) who investigated the consistency of Modern Standard Arabic (MSA) also known as Fus'ha to study the language differences in ten different Arabic speaking countries.

The differences in language or or dialects between Arabic countries can make it incomprehensible for other Arabic speakers. Examples of different dialects are Moroccan Arabic, Cairo Arabic, North Syrian Arabic, and the Arabian Peninsula Arabic (Abdelali, 2004).
Abdelali (2004) presents three separate categories; classical written Arabic; written Modern Standard Arabic; and spoken Arabic. Abdelali's article is an example of localization provision of the Arabic language using ICT. The language that was used in the translation in the paralingual web page layouts in this research was MSA, and the participants were Arabic speakers of different dialects.

3. The Digital Divide

The third World Summit on the Information Society (WSIS) will be held in 2015 to assess what had been agreed upon in WSIS-2003 and WSIS-2005. This research will be considered as one of the services that would contribute to reducing the language digital divide in New Zealand among newcomers and migrants.

Also, bridging the language divide is what the Ministry of Education in New Zealand did in 2003 by announcing that all schools should teach a language other than English from year seven to year ten (May, 2005).

Abd Rozan et al. (2005), define the language digital divide as the unavailability of character encoding or Unicode presentation. Thus, some NGO's website creators such as the Universal Declaration of Human Rights (UDHR) have to put text in the form of a PDF or images of text not able to be encoded. Simultaneously, Ishida (2007) defines a Unicode of a language as the characters required for writing on computers. However Arabic language characters have a Unicode; therefore having Arabic translations in paralingual website presentations is not an issue.

On the other hand, information poverty is another form of the digital divide, and the following are interrelated perspectives on information poverty that will be discussed in detail in the findings Section :

• *Related to the inaccessibility of quality, relevant and suitable information;*
• *Co-determined by the absence of a well-developed, well maintained and user-friendly information infrastructure;*
• *Closely linked to the level of education and literacy, particularly information literacy;*
• *Determined by the attitude/approach towards information and the use thereof as well as the understanding of the value that can be attributed to it;*
• *A global phenomenon, but can also occur within the same community and context;*
• *Related to a lack of material and other means to access information; and*
• *Not only an economic occurrence, but has an important bearing on the cultural, political and social spheres of society* (Britz, 2007, p. 76).

From the refugees' and immigrants' perspectives information poverty is the inability to access useful and important information due to one or more of the above interrelated perspectives. Therefore a paralingual website would contribute in reducing such poverty.

4. Globalization (G11N), Internationalization (I18N), and Localization (L10N)

G11N, I18N and L10N are all interrelated or interconnected and the following definitions - provided by The Localization Industry Standards Association (LISA) (2009) - explain the differences among these technical processes and the relation that exist between them.

Internationalization (I18N) is: *"Internationalization primarily consists of abstracting the functionality of a product away from any particular culture, language or market*

so that support for specific markets and languages can be integrated easily" (The Localization Industry Standards Association (LISA), 2009, p. 1-2);

"Localization (L10N) is: *"Localization is an integral part of globalization and without it, and other globalization efforts are ineffective. Localization is the process of modifying products or services to account for differences in distinct markets"* (The Localization Industry Standards Association (LISA), 2009, p. 1-2); and

Globalization (G11N) is: *"Globalization involves the enterprise efforts that are necessary to launch a product or service internationally"* (Matamoros, 2009, p. 53).

This research topic is linked and related to localization as it is defined as the "process of modifying products or services" and the paralingual web design methodology is an example of a localization process.

5. Building a Website in another Language

The following articles have been mentioned in detail in Section 2.5:

1. Turner et al. (2007) have mentioned six steps to present a target language on a website to localize it, in this case the language is Arabic. For the purpose of this research, a manual or user translation was used to translate the English text that was used for the eye tracking experiment, because the English text was short.
2. Matamoros (2009) has also mentioned three technologies used in the translation localization process: Terminology Management Systems, Translation Memory and Machine Translation, these three technologies are combined in a single desktop application.

By using the Microsoft Words Application, the following steps install multilingual languages on Windows 2000 and later versions:

Start →Control Panel→Clock, Language, and Region→Change keyboards or other input methods→Change keyboards→select one of the installed input languages to use as the default for all input fields (M. Kaplan, 2000).

6. Human Computer Interface

This research is considered as HCI consisting of the online websurvey, and the eye tracking experiment as methods for data collection. *"Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them"* (Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI), 2008, p. 1).

7. Tools and Techniques Used in Building a Website

Section 2.7 of the literature review chapter contains a discussion in detail of the tools and techniques needed for building a website from scratch as was planned for this research; but due to the accessibility and the availability of ready-made websites such as Google Sites it was easier to use this facility for the online websurvey website, and Facebook to design the online websurvey questionnaire.

There were two steps necessary to create the online websurvey for this research:
1- Building the website: https://sites.google.com/site/localizationforarabicspeakers/, this website consists of the six paralingual web page layouts, supplying each layout with a separate URL link which the participants could link to, and then choose their favourite or preferred layout. The participants will be asked to browse or navigate to this website URL link in order to answer Question 1 in the online websurvey questionnaire.

2- Designing a survey questionnaire, using Facebook: http://apps.facebook.com/my-surveys/localizationforarabicspeakers please note that the participants do not need to be logged into Facebook in order to participate in the survey, this website consists of nineteen online websurvey questionnaire questions that the participants will be asked to answer. This quantitative approach for data collection is the first phase of the three phase mixed methods methodology. The second phase is the quantitative approach, the empirical eye tracking experiment; and the third phase is the qualitative approach, interviewing the participants following the eye tracking. Please note that participants do not need to be logged into Facebook in order to participate in the survey.

III. Reflection on the Methodology

1. Setting up the Questions: There are two sets of questions that were used to get information from the participants; the online web-survey questionnaire, and the one-to-one interview following the eye-tracking experiment:

First, the online websurvey questionnaire, was set-up and designed to answer the Research Question one, which aims to investigate what prevents Arabic Speaking migrants from being online and having access to e-government in New Zealand. Therefore, it was important to gather demographic information consisting of the educational backgrounds, age, sex, socio-economic status, personal status, and other relevant information that would help to answer Question one.

Second, the one-to-one interview questions following the eye tracking experiment aimed to get feedback and reflections of the participants on the HCI, using the eye tracker and the effectiveness of using such an interface to collect data in order to answer research Question three.

2. Gathering Participants: There are two set of participants, who participated in this research: the online websurvey participants totalled twenty-nine participants; and the one to one interviews following the eye tracking experiment totalled twenty-five participants.

First, a snowball method was used to gather the online websurvey participants such as the use of the word of mouth to invite participants to participate. There were many attempts to work through the Refuge Centre in Hamilton to invite refugee participants to participate in the online websurvey, but all attempts were unsuccessful.

Second, most of the participants were international students who were invited to participate in the eye tracking through the international language school in the University of Waikato, and a local private international language school. Again, there were many attempts to invite participants through the Refugee Centre in Hamilton, but all attempts were unsuccessful.

3. Interaction with the Refugee Centre in Hamilton: My experience with the Refugee Centre and the Waikato Migrant Resource Centre (WMRC) in Hamilton was disappointing, because I was denied any access to get in contact with their Arabic Speakers' clients. One of the social workers at the centre revealed that showing some

kind of appreciation such as the use of a $10.00 gift certificate would have encouraged their clients to participate, but this would have compromised the study.

4. What Worked and what did not, using the Triangulation Methodology:

Things that worked:

1. The use of triangulation methodology is a good methodology, because it was interesting to compare the results of different methods such as the online web-survey, the eye-tracking, and the one-to-one interviews. There was a moment that the results intersected between Layout-1, Layout-2, and Layout-3.
2. The research questions that were asked to retrieve data were properly designed and approved by the supervisors.
3. Regular visits to the supervisors every month and accomplishing what had been discussed during the meetings.
4. Sticking to the original plan that was drawn and designed at the beginning of the research project.
5. Keeping track of acquiring the necessary equipment, such as the eye-tracking kit.
6. Exploring the literature; the more you read, the more you will be on top of your topic.

Things that did not work:

1. The unsuccessful attempts to get in contact with the WMRC and the Refugee Centre's clients maybe the centre should be approached through a formal and official channel, although my chief supervisor wrote an official letter to them. The WMRC were very protective of their clients, by not revealing any personal information, nor providing any email addresses in order to approach participants.
2. The original plan was to post the preferred layout as an online live website and use a survey to get the users feedback on the new paralingual website, but such a thing would be beyond the scope of the research questions.
3. Unable to provide Arabic text on its own, because the scope of the research is to demonstrate the ability to produce a paralingual website design, on the contrary, if designing a paralingual website design was feasible, therefore producing a website with only one language would be feasible too. Nevertheless, it would oversight on the

benefits and the advantages of being used as an educational tool, and being able to look up the terms, acronyms, and abbreviations in English.

8.2.3. Answers to the Research Questions

The research questions were answered directly and indirectly. The online web survey questionnaires, the eye tracking experiment, and the participants interviews following the eye tracking experiment were all designed to provide answers to the following main three research questions indirectly:

Q 1. What obstacles prevent Arabic speaking migrants from being online and having access to e-government in NZ?

Q 2. What paralingual layout do the majority of Arabic speaking migrants prefer when browsing e-government in NZ?

Q 3. What are the benefits of a paralingual e-government website in NZ for Arabic speakers?

In addition, the answers gathered from the online web survey questionnaires; the results that were collected from the participants' eye tracking experiments; and the answers of participants' interview questions delivered answers to the main three research questions directly and indirectly.

The answers to the research questions based on the results obtained from the three data collection methods; will be discussed in detail in the findings Section.

8.3. Interpreting the Results and Presenting the Findings

The interpretation of the results is not only the concern for the researcher; the results need to be presented clearly in order for the readers and the policy makers to understand them correctly, and to evaluate and judge the results as they might impact on their work (Anonymous, 2004).

This section consists of two subsections - the results of the three data collection methods and the findings. The road map of this Section is summarised in the following:

1. An explanation of how the results relate to the literature, and analysing whether if the results fit with what has been previously published on paralingual web page layouts and Arabic speakers.
2. Addressing all of the results that have answers and relate to the research questions regardless whether the findings are remarkable or not.
3. Defining the configurations and patterns; philosophies and ideologies; and relationships that the results encompass, by validity of results and findings.
4. Mention of conflicting explanations of the results, and any unexpected findings.
5. Limitations and weaknesses, and how they may have affected the results validity of the findings.

8.3.1 The Results

This Section contains the results collected from the three phase research methods; the results of the online websurvey; the results of the eye tracking experiment; and the results of the participants' interviews following the eye tracking experiment.

8.3.1.1 The Results of the Online Websurvey

Chapter 4 contains information of the online websurvey phase and its related subsections including Section 4.7 that consists of the online websurvey results in detail. Facebook was used to construct and build the online websurvey consisting of a questionnaire with 19 questions. See Appendix C. There were nineteen total participants involved in the online websurvey.

The main purpose of this online websurvey was to:

1. Test the general opinion of Arabic speakers about different paralingual webpage layouts, in New Zealand and overseas. See questions 1-4;
2. Arabic speakers' demographics are revealed in questions 5-10, and 15-16; and
3. Arabic speakers' behaviour online is revealed in questions 11-14, and 17.
4. Arabic speakers' comments on this research, and their consent for publication purposes are revealed in questions 18-19.

First, the answers to questions 1-4 are shown in Figure 114. Green is used to indicate the three most preferred paralingual layouts that have been selected by the participants in Question 1. Fourteen participants selected Layout 6 (Arabic on the

right and English on the left); seven participants selected Layout 3 (Paragraph by paragraph with English on top); and four participants selected Layout 2 (Line by line Arabic on top). The answer to Question 1 helped narrow down the paralingual layouts from six to three as the most preferred paralingual layouts by Arabic speakers. Therefore these three most preferred layouts were used in the eye tracking experiment as part of Phase 2.

The Orange is used to indicate the participants' thoughts and feelings about paralingual design as an answer to Question 2. Twenty-three of the participants think the paralingual design is easy to read and understand in English and Arabic; and six participants think that paralingual design helps to learn new vocabulary.

The answer to Question 3, indicated by the red colour, reveals that twenty six of the participants would be encouraged to look for information online more often if paralingual design were to be used in e-government websites.

The answer to Question 4 in regarding to the appraisal of the paralingual design and indicated by the blue colour, points to fourteen of the participants thinking that paralingual design is most important; eight of the participants thinking that paralingual design is important; and four of the participants thinking that the paralingual design is more important.

Therefore, it can be said that the hypothesis that was presumed earlier, before obtaining the results from the data collection, namely, 'That one of the obstacles that prevent new Arabic speaking migrants from having access to vital information available on e-government websites in New Zealand is the language barrier' is true. Hence this barrier could be minimized by the use of paralingual design websites, which would generate a number of advantages favouring not only new migrants but all other involved stakeholders as well.

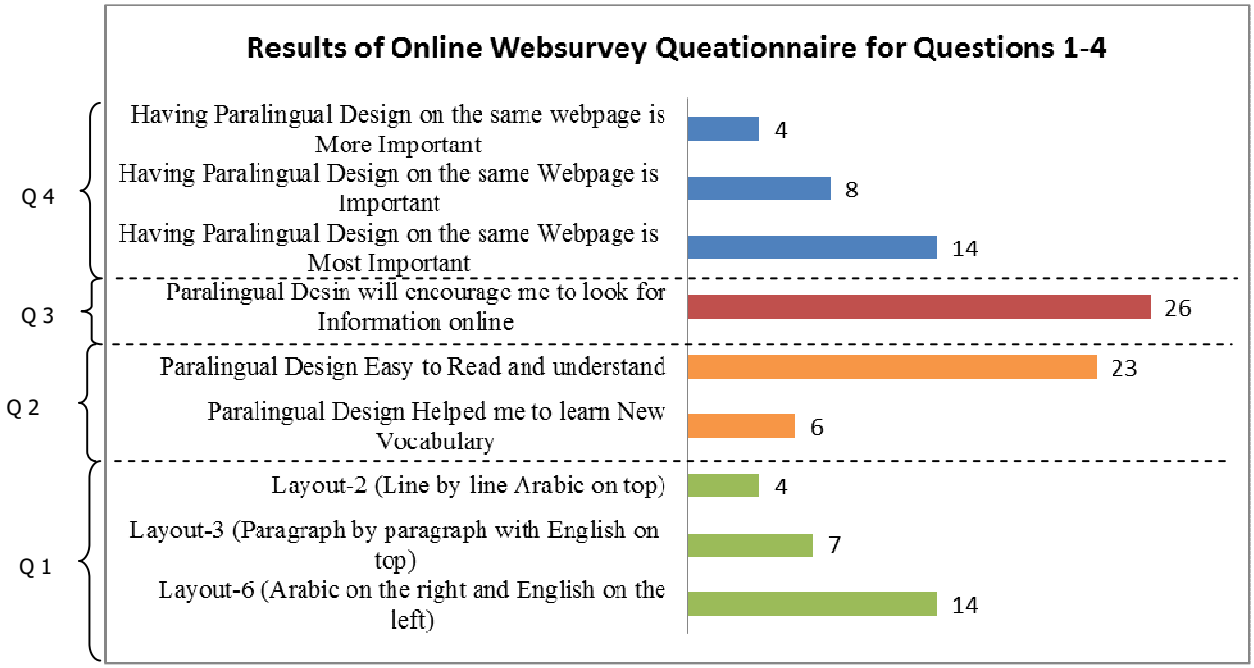


Figure 114 The Results of Questions 1-4

Second, the results of questions 5-8 are shown in Figure 115, and questions 9-10 & 15-16 are shown in and Figure 116.

1. The answers to Questions 5-8 results as shown in Figure 115 reveal the following: Question 5 (green colour): twenty six of the participants were living in New Zealand, and only three of the participants were living outside New Zealand.

Question 6 results (purple colour): eleven of the participants have lived in New Zealand over 10 years; seven have lived in New Zealand for 1-3 years; six have lived in New Zealand for 5-10 years; and four of the participants have been living in New Zealand for 3-5 years.

Question 7 results (orange colour) show that nineteen of the participants were living in Auckland; six of the participants were living in Hamilton; and four of the participants were from other cities.

Question eight results indicated by the blue colour show that fourteen of the participants are over 40 years old; seven are 18-24 years old; six are 25-40 years old; and two of the participants are under 18 years old.

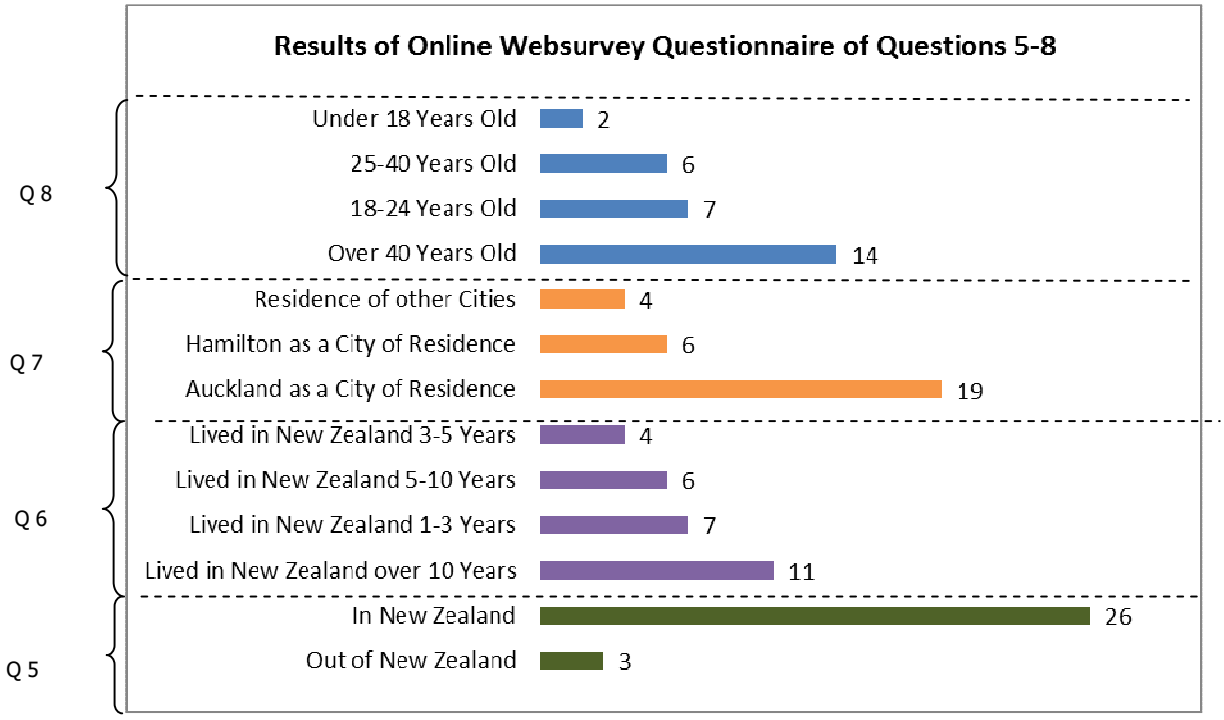


Figure 115 The Results of Questions 5-8

Third, the answers to Questions 9-10 & 15-16 are shown in Figure 116 reveal the following:

Question 9 answer in (brown) show that nine of the participants are from Palestine; seven are from Saudi Arabia; five are from Oman; five are from Iraq; two are from Lebanon; and one is from Canada.

The answer to Question 10 in (purple) show that thirteen of the participants are immigrants; twelve are international students; and one is a refugee.

The results to Question 15 in (red) show that eighteen of the participants are unemployed, and nine were employed.

Question sixteen results indicated by the navy blue colour show that fifteen of the participants were males; and twelve of the participants were females.

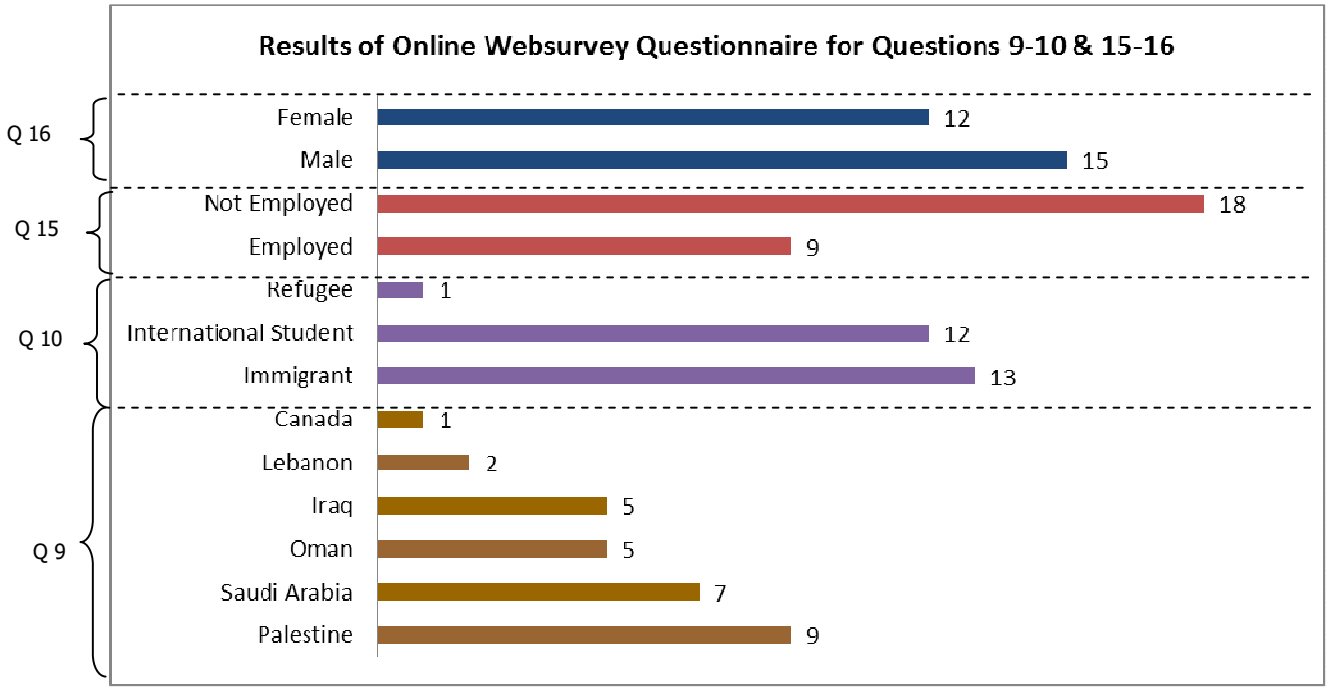


Figure 116 The Results of Questions 9-10 & 15-16

Fourth, the answers to questions 11-14, and 17 are shown in Figure 117.
Questions 11 results in (blue) show that twenty of the participants use the Internet 3-5 hours daily; five use the Internet 5-10 hours daily; three use the Internet 1-2 hours daily; and uses the Internet over 10 hours daily.
Question 12 results (red) show that twenty eight of the participants have broadband Internet at home; and only one of the participants does not.

Question 13 results (orange) show that all the twenty nine participants think it is important to have Internet connection at home.

Question 14 results (purple) show that all the twenty nine participants have a PC at home.

Question 17 results in (green) show that twelve of the participants have used computers for 11-15 years; eleven have used computers for 6-10 years; three have used computers for over 15 years; and one of the participants has used a computer for 0-5 years.

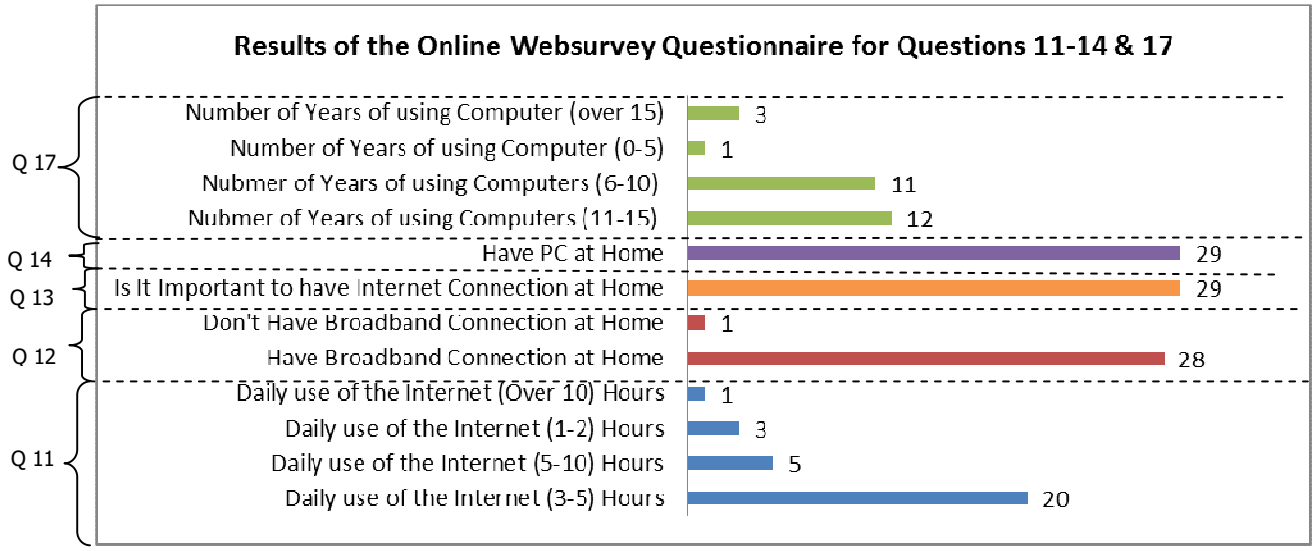


Figure 117 The results of Questions 11-4 & 17

Fifth, the answers to questions 18-19 are shown in Figure 118. Question 18 results in (blue) show that sixteen of the participants have not commented on the online websurvey and on this research; eleven have commented positively on the online websurvey and on this research; and two have commented negatively on the online websurvey and on this research.

The answer to Question 19 in (red) colour shows that all participants did not object to the results of this research being published.

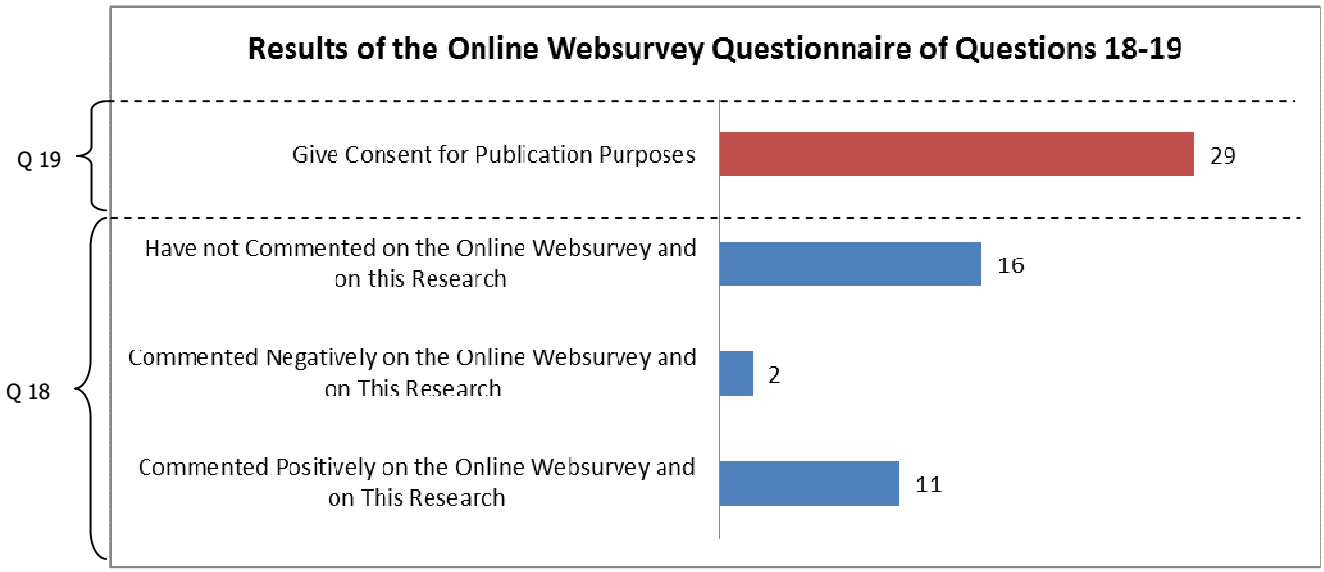


Figure 118 The Results of Questions 18-19

From these results shown in Figures 114, 115, 116, 117 and 118, it is possible to summarise all the majority positions held by the participants in the online websurvey:

- Have selected Layout 6 (Arabic on the right and English on the left);
- Have agreed that a paralingual design is easy to read and understand;
- Have agreed that the paralingual design will encourage other Arabic speakers to look for information online;
- Have selected as the most important the use of paralingual designs on the webpages;
- Living in New Zealand;
- Have lived in New Zealand over 10 years;
- Living in Auckland;
- Over 40 years old;
- From Palestine;
- Immigrant;
- Unemployed;
- Male;
- Use the Internet 3-5 hours daily;
- Have broadband connection at home;
- Think that having Internet connection at home is important;
- Have a PC at home; and
- Have been using a computer for 11-15 years.

These results give general information about the Arabic speakers who participated in the online websurvey and who are part of New Zealand society. They also show that the majority have used computers for 11-15 years, have a PC at home, and have been living in New Zealand for over 10 years. Therefore the economic issue of owning a PC is not a factor, nor the technical knowledge of connecting and using the Internet. The results even show that most of the participants have used computers and the Internet prior to arriving to New Zealand.

8.3.1.2. The Results of the Eye Tracking Experiment

The eye tracking experiment produced results relating to the participants' reading characteristics of paralingual designs, and their preferences for paralingual webpage layouts. The result of Phase 1 concerned with paralingual layouts produced the three most preferred layouts by Arabic speakers. They were then implemented in Phase 2 of the eye tracking experiment. The following is a summary of the data collection methods:

Eye Tracking Experiment
Online Websurvey
Layout 1<==========Sentence by sentence Arabic on top==========>Layout 2
Layout 2<==========Arabic on the right and English on the left==========>Layout 6
Layout 3<==========Paragraph by paragraph English on top==========>Layout 3

These three paralingual layouts were first of all placed on three different webpages; each webpage had the three layouts placed in different positions.

Webpage-1 consists of the three layouts where Layout 1 is positioned on the left hand side, Layout 3 is positioned in the middle, and Layout 2 is positioned on the right hand side of the webpage.

Webpage-2 has Layout 2 positioned on the left hand side, Layout 1 positioned in the middle, and Layout 3 positioned on the right hand side.

Webpage-3 has Layout 3 positioned on the left hand side, Layout 2 positioned in the middle, and Layout 1 on the right hand side of the webpage.

The contents of each webpage were dissimilar, and the layouts were positioned differently on each webpage for analysis of eye movement. The unit of analysis was time, in other words the time that each participant spent reading each layout on each webpage is recorded. The most time spent on a certain layout indicates the participant's preferred layout.

First, The results of the participants' preference for layouts 1, 2, and 3 of the eye tracking experiment; the number of participants who looked for difficult English words in the Arabic translation thus using the paralingual design as an educational

tool; male participants and females participant numbers are shown in Figure 119. Seven of the participants had selected Layout 1 in (green); eight had selected Layout 2 in (purple) colour; and nine had selected Layout 3 in (blue). Ten of the participants had looked up difficult English words in the Arabic translation in (orange).

The participants' selection of their preferred layout was based on the time they had spent during the eye tracking experiment reading that particular layout: time was used as the unit of analysis. Although the participants were given an instruction sheet prior to the eye tracking experiment explaining clearly that they were suppose and expected to look at the three different layouts available on each website, and then start reading their *preferred* layout (this process was described in detail in Section 5.5), but some of the participants spent time on reading more than one layout as it has been revealed by the recorded videos.

On gender participation, twenty of the participants were males in (navy blue); and only four of the participants were females in (pink). The eye tracking females' participation is very low compared with the twelve females who participated in the online websurvey; this is due to the restriction on females' association with males unknown to them or non-family members, as Kardi (2009) described in the literature due to cultural and religious beliefs.

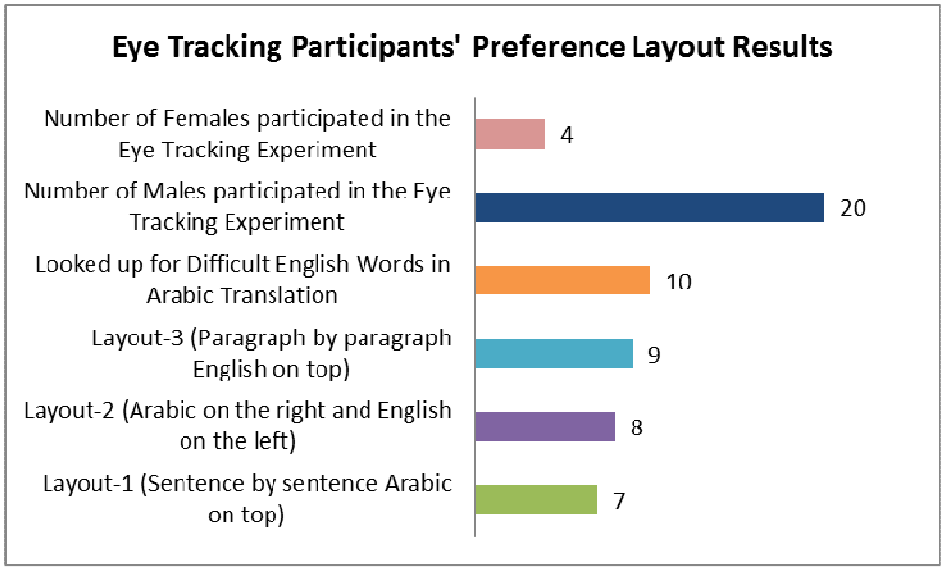


Figure 119 The Eye Tracking Results

Second, the results of the reading characteristics of the participants during the eye tracking experiment are shown in figures 120, 121, 122.

Figure 120 shows the time spent reading each layout on Webpage-1:
Indicated by orange colour: four of the participants had spent 1-3 minutes reading Layout 1 positioned on the left hand side on Webpage-1; two of the participants had spent 3-5 minutes reading Layout 1 on Webpage-1; and one of the participants had spent over 5 minutes reading Layout 1 on Webpage-1.

Indicated by blue colour: four of the participants had spent 1-3 minutes reading Layout 2 positioned on the right hand side on Webpage-1; two of the participants had spent 3-5 minutes reading Layout 2 on Webpage-1; and there were no participants noted for the over 5 minutes time.

Indicated by purple colour: six of the participants had spent 1-3 minutes reading Layout 3 positioned in the middle on Webpage-1; four of the participants had spent 3-5 minutes reading Layout 3 on Webpage-1; and only one participant had spent over 5 minutes reading Layout 3 on Webpage-1.

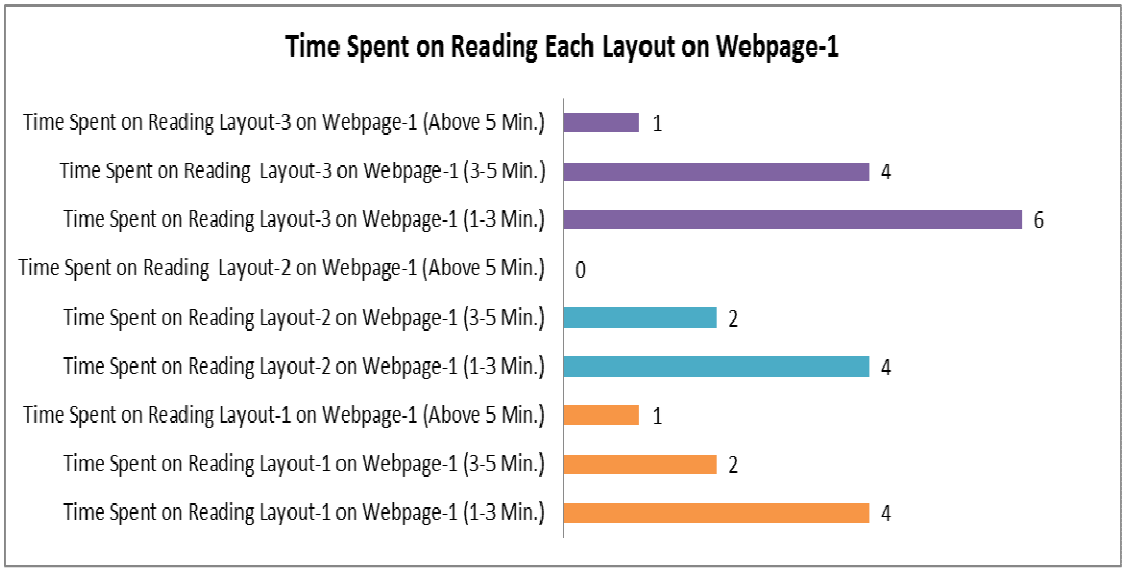


Figure 120 Calculated Time Spent on Reading Each Layout on Webpage-1

Figure 121 shows the time spent reading each layout on Webpage-2:
Indicated by orange colour: four of the participants had spent 1-3 minutes reading Layout 1 on Webpage-2 positioned in the middle of the webpage; two of the

participants had spent 3-5 minutes reading Layout 1 n Webpage-2; and only one participant had spent over 5 minutes reading Layout 1 on Webpage-2.

Indicated by blue colour: eight of the participants had spent 1-3 minutes reading Layout 2 on Webpage-2 positioned on the left hand side of the webpage; three of the participants had spent 3-5 minutes reading Layout 2 on Webpage-2; and none of the participants had spent over 5 minutes reading Layout 2 on Webpage-2.

Indicated by the purple colour: five of the participants had spent 1-3 minutes on reading Layout 3 on Webpage-2 positioned on the right hand side; only one of the participants had spent 3-5 minutes on reading Layout 3 on Webpage-2; and none of the participants had spent over 5 minutes on reading Layout 3 on Webpage-2.

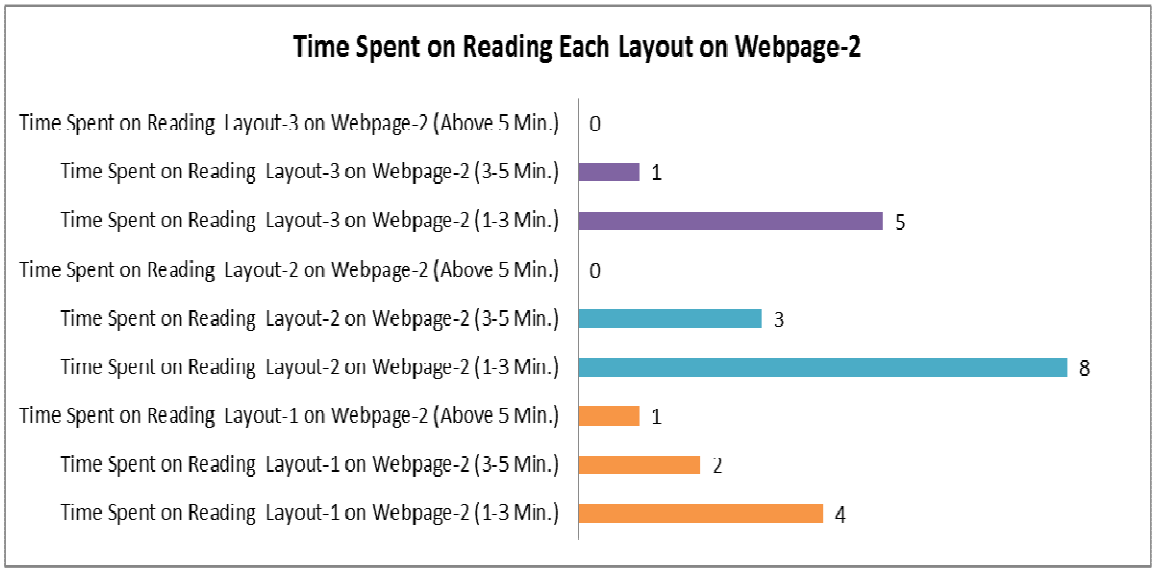


Figure 121 Calculated Time Spent on Reading Each Layout on Webpage-2

Figure 122 shows the time spent reading each layout on Webpage-3:
Indicated by orange colour: seven of the participants had spent 1-3 minutes reading Layout 1 on Webpage-3 positioned on the left hand side; one of the participants had spent 3-5 minutes reading Layout 1 on Webpage-3; and one of the participants had spent over 5 minutes reading Layout 1 on Webpage-3.

Indicated by blue colour: eight of the participants had spent 1-3 minutes reading Layout 2 on Webpage-3; one of the participants had spent 3-5 minutes reading

Layout 2 on Webpage-3; and none of the participants had spent over 5 minutes reading Layout 2 on Webpage-3.

Indicated by purple colour: four of the participants had spent 1-3 minutes reading Layout 3 on Webpage-3; two of the participants had spent 3-5 minutes reading Layout 3 on Webpage-3; and none of the participants had spent over 5 minutes reading Layout 3 on Webpage-3.

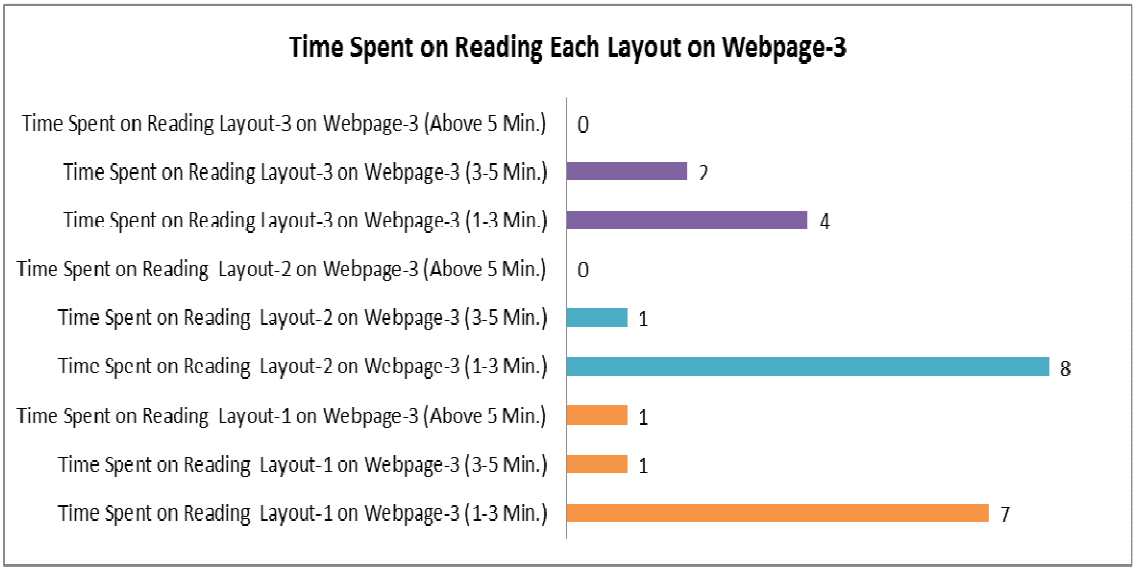


Figure 122 Calculated Time Spent on Reading Each Layout on Webpage-3

In regards to the participants' reading characteristics, the above results show that the majority participants took 1-3 minutes to read their preferred paralingual layout on each of the webpages. Edge Studio LLC (2013) mentions that the average reading speed is 3 words per second. Allegedly if the English text of Layout 3 on Webpage-3 has a total of 130 words and on average it took the participants 90 seconds to read it, then on average newcomers Arabic speakers' reading speed is 1.4 words per second to read a paralingual webpage layout. This finding means that people for whom English is their second language, have a reading speed of the paralingual design webpage half that of the average English speakers of an English monolingual webpage.

Third, the results of the relationship between the layouts' position on the webpage with the participants' preference of each layout on each webpage are shown in Figure 123.

On Webpage-1 in (blue), Layout 1 was positioned on the left hand side; Layout 3 was positioned in the middle; and Layout 2 was positioned on the right hand side. The majority of the participants, eleven, had selected Layout 3 positioned in the middle as their preferred layout.

On Webpage-2 in (red), Layout 2 was positioned on the left hand side; Layout 1 was positioned in the middle; and Layout 3 was positioned on the right hand side. The majority of the participants, twelve, had selected Layout 2 positioned on the left hand side as their preferred layout.

On webpage-3 in (green), Layout 3 was positioned on the left hand side; Layout 2 was positioned in the middle; and Layout 1 was positioned on the right hand side. The majority of the participants, nine, had equally selected Layout 1 and Layout 2.

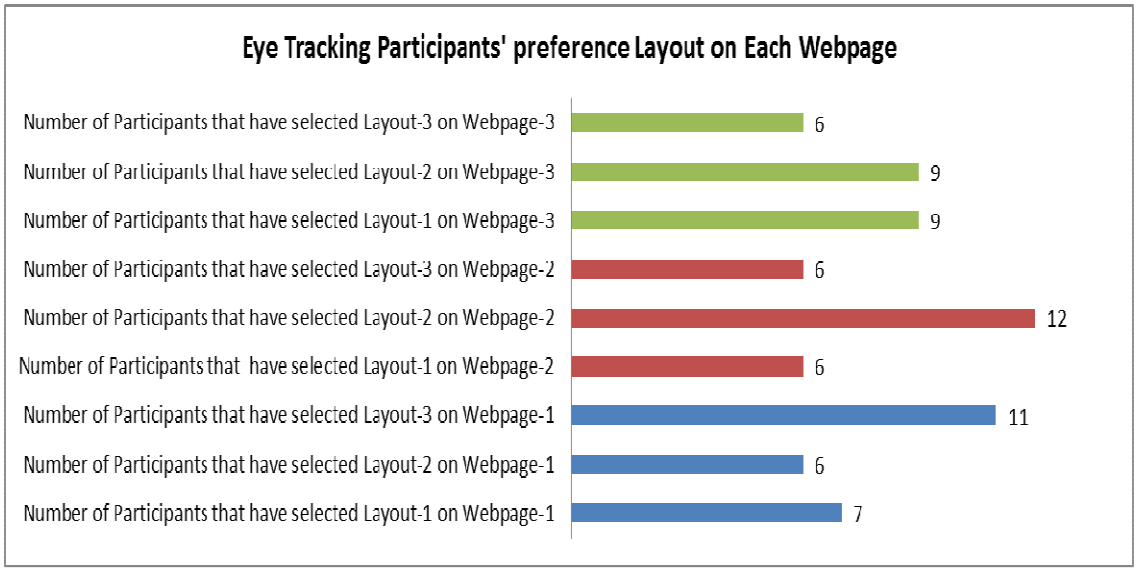


Figure 123 Eye Tracking Results of Layouts Position on Each Layout

The above results show that the position of a certain layout on the computer screen was consistent with the participants' selection of it as their preferred layout, but *not* whatever was positioned on the left hand side for example. That is to say that Layout 1 was the most preferred layout when it was positioned on the left hand side on Webpage-1. On the other hand, Layout 2 was the most preferred layout when it was positioned on the left hand side on Webpage-2. However, Layout 3 was positioned on

the left hand side on Webpage-3, but it was not the most preferred layout, inversely Layout 1 and Layout 2 were equally the most preferred layouts.

According to one article mentioned in the literature section refers to the reading of the web content as an F-shaped pattern. It is based on a study where 232 users looked at thousands of webpages in an eye tracking study. The user first read across the upper part horizontally, next they move down a little and read across horizontally, lastly to finish they scan the left side vertically to form an F shape (Nielsen, 2006).

Similarly the design of Webpage-1 indicated by the blue colour, as shown in Figure 122, has a T-shape; Webpage-2 indicated by the red colour has an F-shaped; and Webpage-3 indicated by the green colour has an F-shaped upturned or inverted.

8.3.1.3. The Results of the Participants' Interviews

This Section contains the interview results that followed the eye tracking experiment. This is the qualitative third phase of the data collection method. This phase is very important because it gives more detailed information about the participants' points of view regarding their choices made during the eye tracking experiment. Only the *majority* of the participants' interview results are given and discussed in this Section . The full results of the participants' interviews are available in Chapters 6 and 7.

First, looking at the participants' demographics, Figure 124 shows the followings:

- Twenty of the participants are males, indicated by orange;
- Twenty one of the participants are international students, indicated by light blue;
- Eleven of the participants are 18-23 years old, indicated purple;
- Eleven of the participants have just finished high school, and studying in an English language school, indicated by green colour;
- Eleven of the participants have good English language proficiency, indicated by red; and
- Eleven of the participants have lived in NZ 1-6 months, indicated blue.

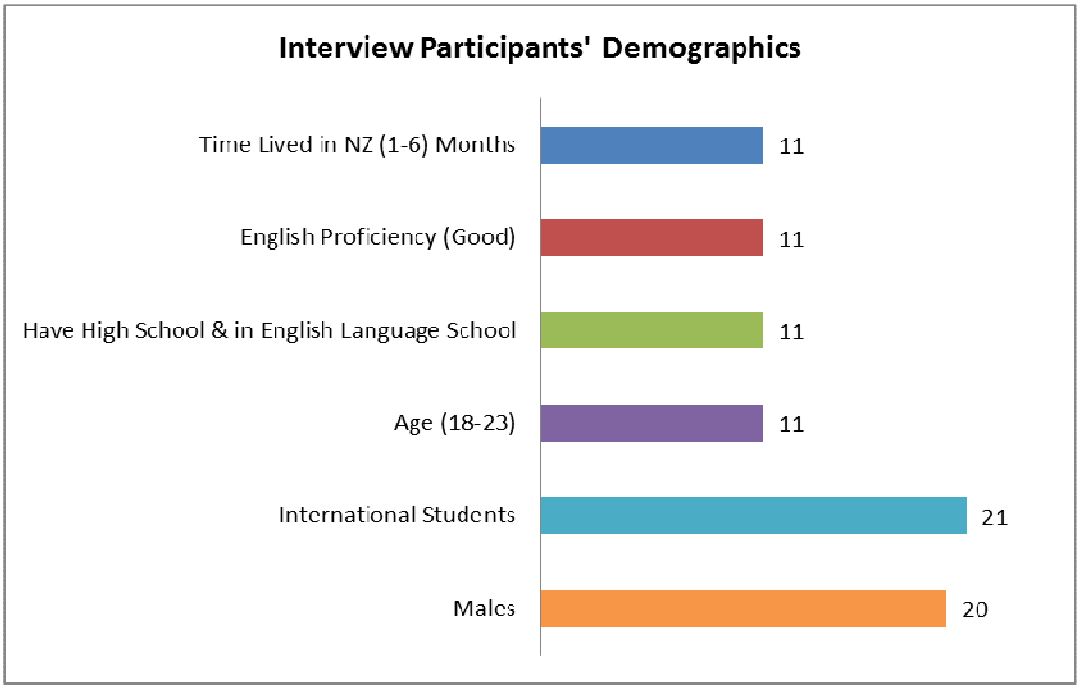


Figure 124 Interview Participants' Demographics (Majority)

The majority of participants are young newcomers, and possibly lack knowledge of the law and regulations in New Zealand as well as other important information. Therefore, if they do not have an adequate grasp of English to enable them to understand the new society that they are living in now they could be stressed and they may get into trouble. Therefore a paralingual website that provides them with the information they are looking for would be invaluable.

Second, looking into the participants' Internet usage, their knowledge, and habits of using the Internet and the time they spend using it, Figure 125 shows the following:

- Twenty three of the participants have Internet connection at home, indicated by orange;
- Eighteen of the participants use Arabic and English for browsing the Internet, indicated by light blue; and
- Fifteen of the participants have been using the Internet 6-10 years, indicated by purple.

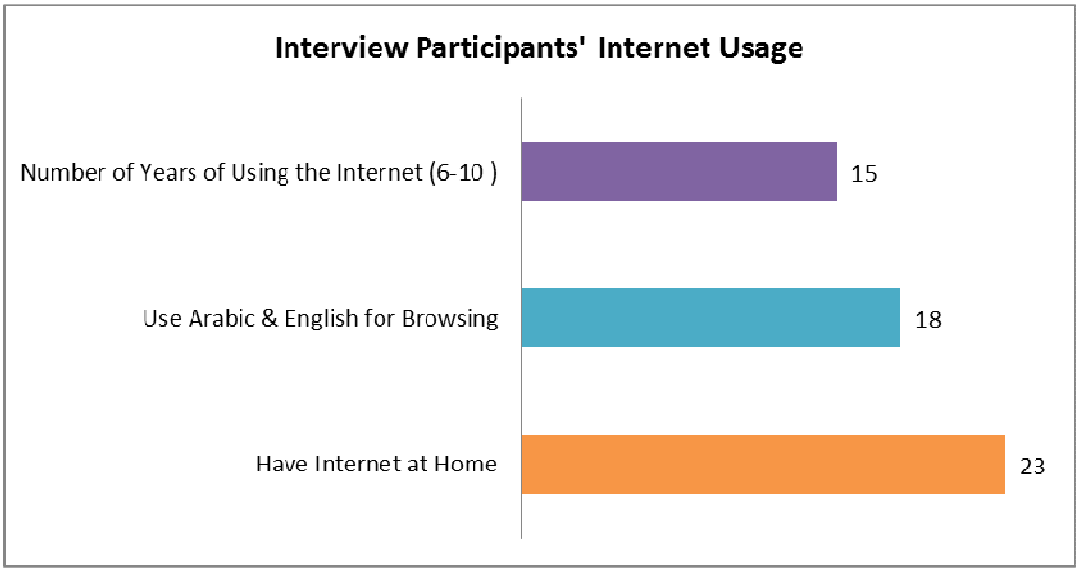


Figure 125 Participants' Internet Usage (Majority)

The result showing that the majority of the participants use both Arabic and English for browsing the Internet means paralingual websites would be very beneficial, because they are comfortable using both languages.

The results also show a very important point that the majority of the participants were using the Internet before they came to New Zealand. This means they have no technical difficulties using ICT.

Third, looking into the participants' paralingual design preferences, Figure 126 shows the following:

- Ten of the participants have selected Layout 2 as their 1st choice of a paralingual layout preference, indicated by orange;
- Nine of the participants have selected Layout 2 as their 2nd choice paralingual layout preference, indicated by light blue;
- Twenty of the participants' 1st choice matched their eye tracking experiment's choice, indicated by purple;
- Fourteen of the participants think that using paralingual websites are easier to read, indicated by green;
- Twenty three of the participants think that paralingual websites could be used as an educational tool, indicated by the red colour; and

- Twenty three of the participants think that paralingual websites would create trust in the government, indicated by the blue colour.

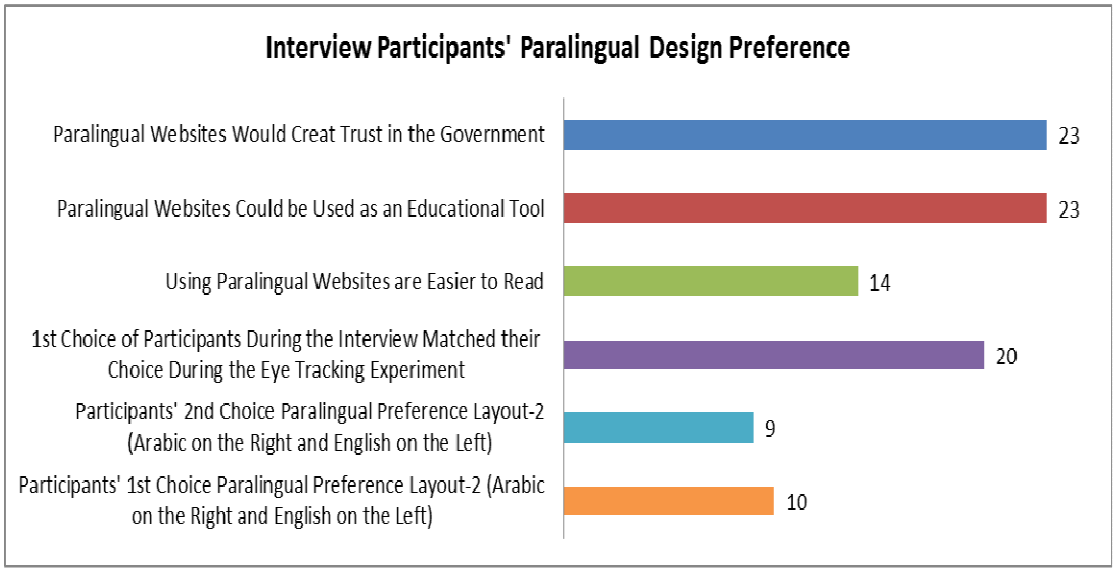


Figure 126 Participants' Paralingual Design Preference (Majority)

The results also relate to correlation – or not – of choices in the eye tracking and the interview sessions. Although the interview session immediately followed the eye tracking experiment, but 4 participants had selected a certain paralingual webpage layout during the eye tracking experiment, different to their interviews 1st choice selection, as a result, they have selected a totally different layout as their paralingual webpage layout preference, therefore they have changed their mind and that is common. This is similar to Sigman's (2009) analysis: "*What people say they do and what they actually do are two different things*" (Sigman, 2009, p. 1). This was mentioned in Section 2.8. See Appendix Q contains the analysis of the twenty four participants.

Table 43 shows the participants' results of the eye tracking and interviews of their preferred paralingual layouts

Table 43 Participants' Eye Tracking and Interviews Paralingual Preferred Layouts

Participants	Eye Tracking	Interviews	
		1st Choice	2nd Choice
1	3	3	-
2	2	2	3
3	3	3	1
4	1	1	-
5	3	2	1

6	1	1	-
7	1	1	2
8	1	1	3
9	3	3	2
10	2	2	3
11	1	2	1
12	3	3	2
13	3	3	2
14	2	3	2
15	2	2	-
16	3	2	3
17	2	2	3
18	2	2	-
19	2	2	-
20	1	1	2
21	1	1	2
22	3	3	2
23	3	3	2
24	2	2	3

- Twenty participants selected the same layout in the eye tracking as 1st choice in the interview.
- Three participants selected the same layout in the eye tracking as 2nd choice in the interview.
- Six participants did not make 2nd choice selection in the interview.
- Four participants did not select the same layout in the eye tracking as 1st choice in the interview.

Figure 127 shows the results of the participants' eye tracking and interviews preference:

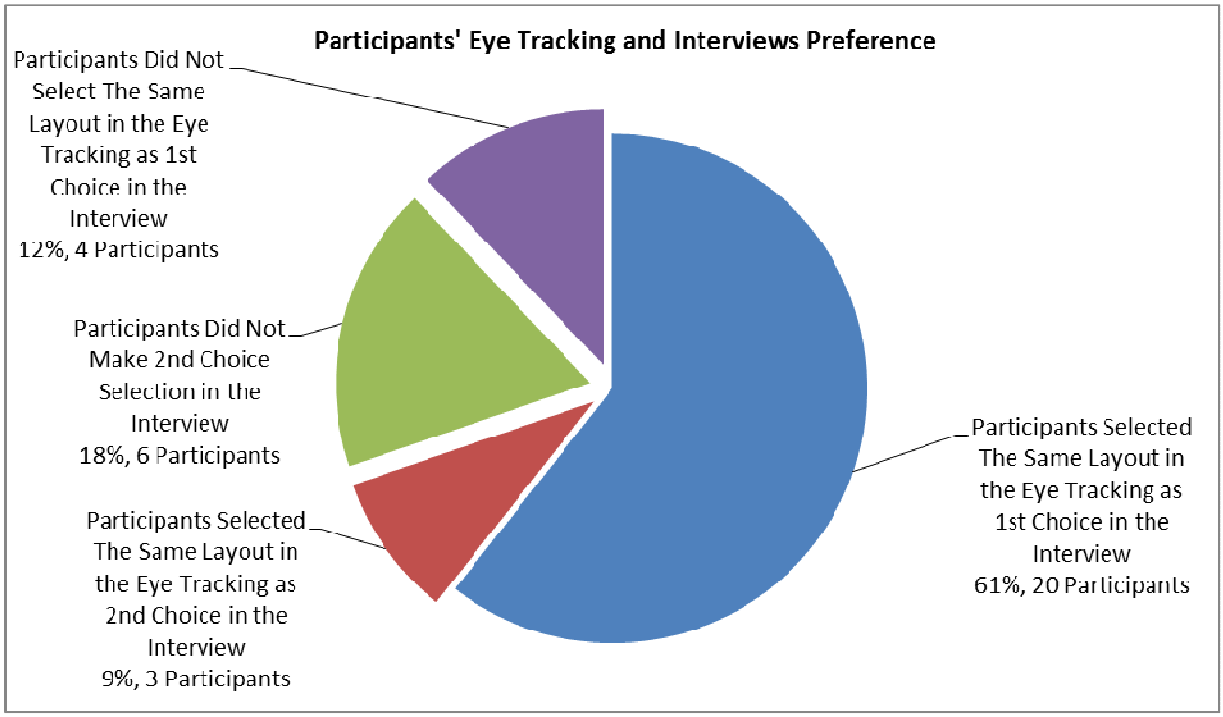


Figure 127 The Participants' Eye Tracking and Interviews Preference

Figure 128 shows two graphs. The X-axis represent the three different layouts participants selected during the interviews, and the Y-axis shows the three different layouts participants selected during the eye tracking experiment. Graph-A shows the twenty participants whose their 1st choice layout selection during the interviews matched their layout selection during the eye tracking experiment. Graph-B shows the four participants whose their 1st choice layout selection during the interviews did not match their eye tracking experiment selection.

Graph-A in Figure 128 shows the twenty participants whose their 1st choice of layout selection during the interviews matched their layout selection during the eye tracking experiment, are forming a *straight line*.

On the other hand, Graph-B in Figure 128 shows that Participant 5, Participant 11, Participant 14, and Participant 16 whose 1st choice selection in the interviews did not match their selection during the eye tracking experiment, are *forming a curve*.

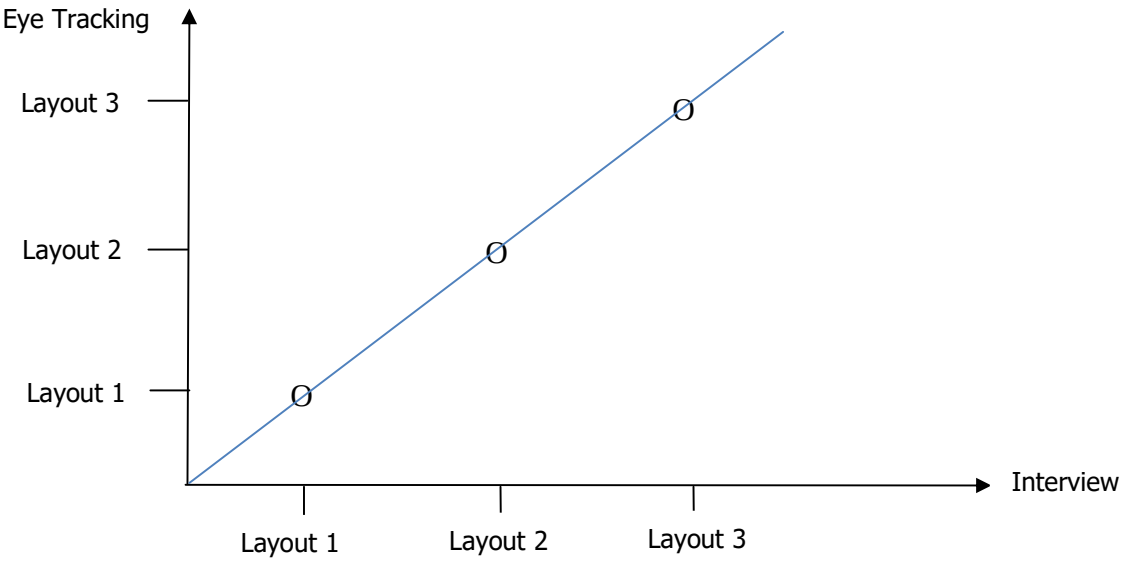
Furthermore, Participant 5 selection during the eye tracking experiment was Layout 3, and during the interview was Layout 2. However his 2nd choice selection during the

interview was Layout 1 and that did not match his selection in the eye tracking experiment.

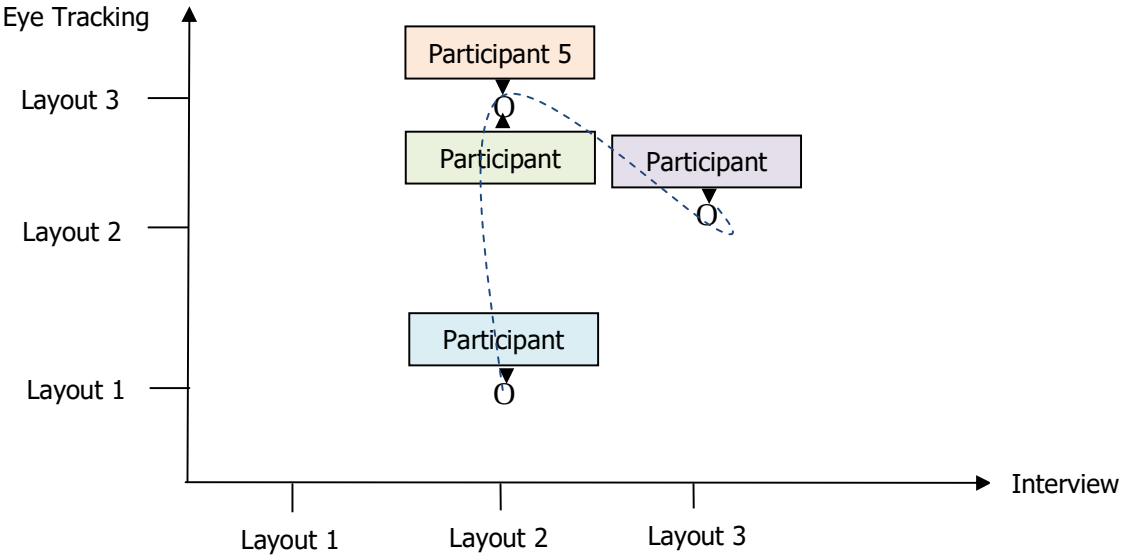
Likewise, Participant 11 selection during the eye tracking experiment was Layout 1, and during the interview was Layout 2, but his 2nd choice selection during the interview matched his selection in the eye tracking experiment.

Similarly, Participant 14 layout selection during the eye tracking experiment was Layout 2, and during the interview was Layout 3, but her 2nd choice selection during the interview matched her selection in the eye tracking experiment.

Finally, Participant 16 layout selection during the eye tracking experiment was Layout 3, and during the interview was Layout 2, but his 2nd choice selection during the interview matched his selection in the eye tracking experiment.



Graph-A 1st choice participants' layout selection in Interviews matched their selection in the eye tracking experiment



Graph-B 1st choice participants' layout selection in the Interviews did not match their selection in the eye tracking experiment

Figure 128 The Participants Layouts Selection of the Interviews vs. the Eye Tracking Experiment Presented in Graphs

Fourth, regarding the participants' E-government usage, Figure 129 shows the following:

- Sixteen of the participants have been using E-government, indicated by orange;
- Twenty one of the participants would use the E-government, if paralingual websites were available, indicated by light blue; and
- Fourteen of the participants are not using the E-government because of the English language barrier, indicated by purple.

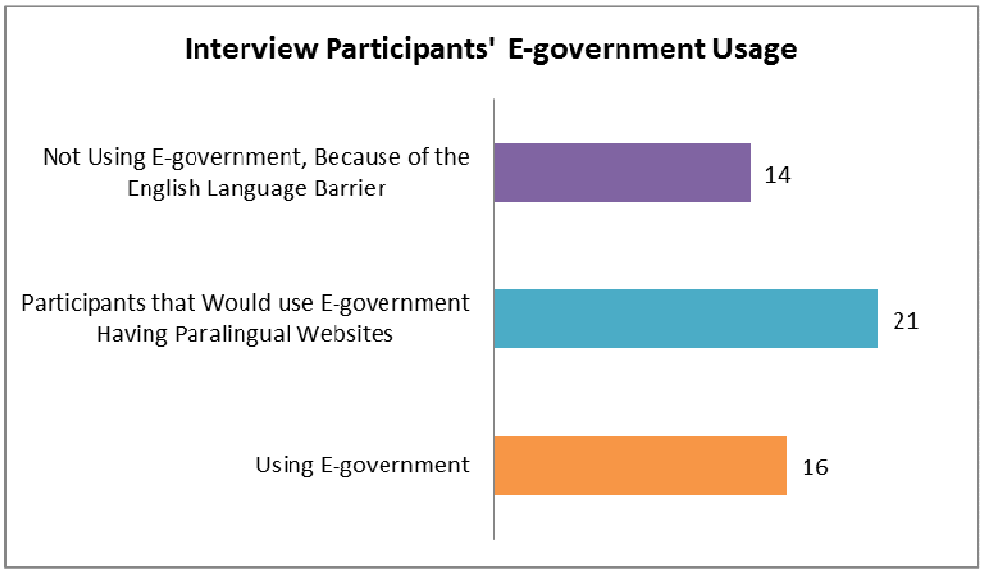


Figure 129 Participants' E-government Usage

The above results indicate that the majority of the participants would use the E-government more if paralingual websites were available, because the English language barrier is the reason preventing the majority of the participants of using E-government.

8.3.2. The Findings

This subsection contains a summary of the results and relates them to answers of the following research questions:

Q 1. What obstacles prevent Arabic speaking migrants from being online and having access to e-government in NZ?

Q 2. What paralingual layout do the majority of Arabic speaking migrants prefer when browsing e-government in NZ?

Q 3. What are the benefits of a paralingual e-government website in NZ for Arabic speakers?

8.3.2.1. Research Answers

This subsection contains the answers to these three research questions based on the results collected from all three research data collection methods.

A-1 The following are the obstacles preventing Arabic speakers being online and having access to E-government:

- English language barrier; and
- Monolingual E-government websites.

A-2 The following are the results of the majority of Arabic speaking migrants' preference for different paralingual webpage layouts implementing the three data collection methods:

- The results of the online websurvey show that the majority of the participants have selected Layout 6 (Arabic on the right and English on the left) that is equivalent to Layout 2 in the eye tracking experiment;
- The results of the eye tracking experiment show that the majority have selected Layout 3 (Paragraph by paragraph English on top and Arabic below); and
- The results of the participants' interviews show that the majority of the participants have selected Layout 2 (Arabic on the right and English on the left).

Therefore, the answer to Q 2 research question is Layout 2 (Arabic on the right and English on the left).

A-3 The following are the advantages of a paralingual e-government website in New Zealand for Arabic speakers based on the results of the online websurvey and the participants' interviews:

- Paralingual websites are easier to read;
- Paralingual websites could be used as an educational tool; and
- Paralingual websites would create trust in the government.

8.3.2.2. The Main Themes of the Results of the Three Research Methods

This subsection contains a tabulated summary of the main themes of the three different data collection research methods as shown in Table 44.

Anonymous (2004) mentions that in qualitative findings the researcher or interviewer should consider credibility, dependability, conformability and transferability.

> *Credibility means interpreting the qualitative data in a way that offers explanations that are consistent with the data collected…Dependability means that data can be replicated. The replication is not necessarily of the results, but of the process used to obtain the results…Confirmability means that other researchers can have access to the data and can do their own analysis…Transferability means the use of the findings to make inferences to other populations* (Anonymous, 2004, p. 117).

Table 44 Main Themes of the Results of the Research Methods

Issues/Themes	The Online Websurvey	The Eye Tracking Experiment	The Participants' Interviews
Research Method Used	Quantitative	Quantitative	Qualitative
Paralingual Layout Preference	Layout 6 (Arabic on right, English on left)	Layout 3 (Paragraph by paragraph, English on top, Arabic below)	Layout 2 (Arabic on right, English on left)
Number of Participants	29	24	24
Males	15	20	20
Females	12	4	4
Immigrants	13	2	2
International Students	12	21	21
Refugees	1	0	0
Work Permit	3	1	1

8.3.2.3. Arabic Speaking Groups Indicators in Society

This subsection describes the social indicators for Arabic speakers. It is based on the society and dynamic social theory that Gray and Elliott (2001) mention in their research. It explains the effects of the four main dimensions on migrants: economic, social, cultural, and political in the short and long term.

Based on that society and social theory, the following information shown in Table 42 and Table 43 is the result of associating with the Arabic speaking participants during the interviews, as well as their being part of and around the people of this community.

First, indicators associated with international students, immigrants, refugees and others as shown in Table 45.

Table 45 International Students and Immigrants, Refugees, and Others - Indicators

Dimension	Settlement Phase	International Students	Immigrants, Refugees and Others
Economic	**Short-term Settlement**	Enrol in an English language school.	*Entering job market, and financial independence.*
	Longer-term Integration	Become proficient in English, and be accepted at a university.	*Career advancement, income equivalence, and entry into field of prior employment.*
Social	**Short-term Settlement**	Establish social network, and get access to information within society.	*Established social network, and diversity within social network.*
	Longer-term Integration	Make good use of the information within society such as locating Arabic speakers' organisations.	*Accessing institutions, and engaging in efforts to change institutions.*
Cultural	**Short-term Settlement**	Introduced to different lifestyles, but not necessary adapt to them.	*Adaptation of various aspects of lifestyle (e.g. diet, family relationships).*
	Longer-term Integration	Some may adapt to various lifestyles, but not necessarily redefine cultural identity nor reassess values.	*Engaging in efforts to redefine cultural identity, and adapting or reassessing values.*
Political	**Short-term Settlement**	Some may apply for citizenship after graduation.	*Citizenship and voting.*
	Longer-term Integration	Have a New Zealand passport, and become a New Zealander.	*Participation in political parties and participation in socio-political movements.*

Reformed from (Gray & Elliott, 2001, p. 73)

Second, indicators associated with international students; and immigrants, refugees and others as shown in Table 46.

Table 46 Women and Men Indicators

Dimension	Settlement Phase	Women	Men
Economic	**Short-term Settlement**	Do not have to look for a job, but it is desirable.	Have to look for a job and financial independence.
	Longer-term Integration	Work in prior employment if applicable, and improve income.	Enter field of prior employment, and earn better salary.
Social	**Short-term Settlement**	Start to get familiar with society and socialise through kids' friends, and important organisations.	Start making friends and socialise.
	Longer-term Integration	Become socialised with neighbours, and get involved in voluntary work.	Getting involved with Arabic speakers' society, and the outer circles.
Cultural	**Short-term Settlement**	It would be hard to adapt new lifestyles in the beginning.	It is not easy to adapt to new lifestyle.
	Longer-term Integration	Teaching the children the Muslim Values would be the ultimate goal.	Reassessing values, redefine cultural values to fits Muslim values.
Political	**Short-term Settlement**	Citizenship and voting.	Citizenship and voting.
	Longer-term Integration	Getting more involved with Muslim organisations.	Get involved in socio-political movements/Muslim organisations.

- The results shown in Table 19 in Section 4.8.5.2 indicate that women are as active as men in using ICT in their daily lives; and that their being supressed by men is a myth.

8.3.2.4. The "Paralingual" Expression

The term "paralingual webpage layouts" is almost non-existent on the Internet, except for the definition that Segovia et al. (2009) have provided that defines this layout as information using two or more languages on the same webpage. Therefore, it is important to make note of the different terms and expressions that are associated with the word "Paralingual".

Accordingly, the term paralingual is also appears on the web as a medical term used to identify places in the mouth under the tongue (Inkling, 2013). On the other hand, the terms paralingual communication, and paralanguage appeared with the same meaning. In addition Paralingual communication is:

> *The tone and pitch of your voice when you're talking to people. If you sound anxious or upset, that will have an impact on the way people take the news you are giving. You use paralingual communication all the time—it's a really important part of how you communicate* (Esoteric Nuggets, 2012, p. 1).

Similarly, paralanguage is: *"Nonverbal means of communication, such as tone of voice, laughter, and, sometimes, gestures and facial expressions that accompany speech and convey further meaning"* (Wiley, 2010).

8.4. The Research Limitations, Delimitations and Strengths

This section consists of the research limitations and delimitations; and strength in Subsections 8.4.1, and 8.4.2 respectively.

Limitations are: issues that would have an effect on the research results if they had not been controlled or limited at the beginning, issues such as the size and background or category of the sample under study; and the budget and time to complete the research study. Delimitations are; unexpected issues that would have an effect on the results - those have not been predicted or estimated preceding the undertaking of the data collection (Ismail, 2004).

A different analysis was given by a PhD Student (2010). That limitations are possible imperfections that cannot be controlled, such as the category or classification of potential participants in a survey not being actually a random sample; the reliability of common tests for data findings; and limited to a certain time. Then the study could be affected by the procedures of society during that time such as the economy. On the other hand delimitations are the defined controlled boundaries of the research such as objectives, theoretical goals, variables, population under study and research questions (PhDStudent, 2010). It is up to the readers or peers to define and recognise expected

and unexpected limitations, regardless of what have been defined or mentioned in the literature articles.

8.4.1. Limitations and Delimitations of This Research

There have been some expected and unexpected limitations or issues prior to the start of this research, such as the following:

- **Postponements:** There were some expected and unexpected delays such as:
  - **I)** The design and construction of the online websurvey and the website in Phase-1 of the data collection was at first problematic, but then this task was successfully accomplished by using a free version of Facebook surveys and Google Sites. An unexpected delay was the feedback from the supervisors regarding some specifications and details about the design and construction of the online websurvey website to resemble the www.settlement.org.nz website. One expected delay was about approaching the anticipated participants for the online websurvey, but what was not expected was the unwillingness of the Refugee Services to collaborate with providing potential participants' details in order to protect the privacy of their clients. All these details are listed in Chapter 4.
  - **II)** Another an unexpected delay was the availability of an eye tracking device in order to perform the eye tracking experiment as Phase-2 of data collection. This was then successfully accomplished by purchasing the Mirametrix eye tracker with the help of the Faculty of Computer Science at the University of Waikato; the purchase process took approximately four months. Then a pilot study using this eye tracker was implemented with the help of three international students in order to test the process and steps of the validity of the eye tracking experiment for data collection. Another unexpected delay was the time that it took to locate and contact potential participants; again, the Refugee Services were reluctant to provide any details of their clients. The alternative was to contact the English Schools in Hamilton who were more supportive; thus

most of the participants in the eye tracking experiment and the interviews were international students. All details are listed in Chapter 5.

III) An expected delay concerned the scheduled and pre-booked meetings with the participants to perform the eye tracking and the interviews; approximately two hours was allowed for travelling time from Auckland to Hamilton. See the final research project time plan presented in Appendix R.

- **The Population Under Study:** There were three limitations with regards to the participants in this research:

  I) The participants' size for the online websurvey was considered very modest, but it did provide a general viewpoint from the participants on different issues. There was an expectation of more refugees and migrants' participation in the eye tracking experiment and the interviews following it.

  II) The participation of women in the eye tracking experiment was very insignificant compared with their participation in the online websurvey and that was due to cultural and religious respect.

  III) Due to the fact that the researcher living in Auckland, while the eye tracking experiment and the interviews took place in Hamilton approximately two hours away, had an effect on the prospective sample of refugees and immigrants in this research, because the researcher is more familiar and know a lot of refugees and migrants living in Auckland, but due to the travelling and distance barrier it was difficult for them to participate. In addition it was not possible to arrange to relocate the eye tracking experiment equipment's setup in Auckland.

- **Preliminary Study Paradigm or Framework:** The initial plan was to use the results produced and collected from the three data collection methods to be implemented and employed in actual paralingual e-government websites such as www.settlemetn.org.nz hence, the results show that Arabic speakers' preference of a paralingual layout is Arabic on the right and English on the left. However, such an implementation of a paralingual website is considered as a for the future after investigation and research.

More responses would be gathered, either through a new online websurvey, or focus groups or interviews to test more thoroughly the opinion of Arabic speaking e-government users of this paralingual design.

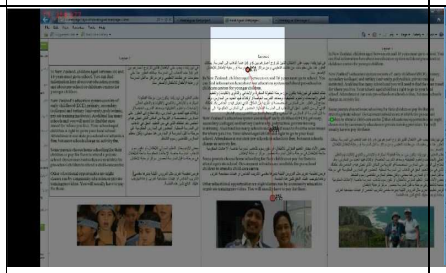
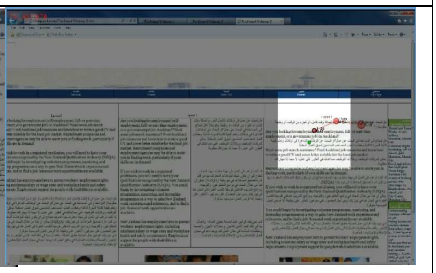
8.4.2. Strength of This Research

This research's significance is summarised in the following:

- This research contributes to the body of knowledge of the Arabic preference of paralingual webpage layout. This would be significant to e-government web developers; NGOs dealing with migrants and refugees; English schools dealing with international students; for migrants and newcomers who are seeking important information when relocating to this new society; and to the Mangere Refugee Resettlement Centre (MRRC), which is an accommodation compound established on 40 square kilometres for all UN Quota Refugees who reach New Zealand. They enter for six weeks for evaluation and training, this accommodation compound is built by the New Zealand Government.
- The research methodology of the data collection consists of mixed methods categorised into three phases: the online websurvey, the eye tracking experiment and the interviews following the eye tracking. This methodology adds more reliability to the results and give a more explicit opinion of the population under study.
- The results of the online websurvey of Phase-1 produced the three most preferred layouts according to the majority of the participants, out of the six layouts that were used. These three layouts were then used in the eye tracking experiment of Phase-2. Then, the participants' interviews of Phase-3 provided feedback both on the selection they have made during Phase-2, and also on the benefits of paralingual design. This methodology provides more reliability for the obtained results.
- The issues of paralingual Arabic speakers' preference were examined in details and in depth; in particular:
  - **I)** During the eye tracking experiment, where the unit of analysis was time in minutes that each participant spent on each layout on three

different websites and where the most time spent on a certain or layout was considered to be as the participant's preferred layout. Appendix K contains all the participants' results and the recorded time spent on each layout. Table 47 and Figure 130 are used as an example to show it:

Table 47 Participant 4 Eye Tracking Experiment Results

Webpage-1 (Total = 3:30 Minutes)	Webpage-2 (Total = 2:55 Minutes)	Webpage-3 (Total = 2:15 Minutes)
Area of Interest-1 (AOI-1) P 4 Spent 20 seconds looking at all three layouts. **AOI-2** P 4 started reading Layout 1 (sentence by sentence Arabic on top) the line by line presentation. He looked for difficult English words two times during reading Layout 1 (sentence by sentence Arabic on top). P 4 spent 3:30 minutes on reading Layout 1 (sentence by sentence Arabic on top)	**AOI-1** P 4 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen, and he looked up difficult English words in Arabic three times. P 4 spent 2:55 on reading Layout 1 (sentence by sentence Arabic on top)	**AOI-1** P 4 started reading the English text of Layout 1 (sentence by sentence Arabic on top); he continued reading line by line, the Arabic translation, and then the English text. P 4 spent 2:15 on reading Layout 1 (sentence by sentence Arabic on top).
		
Webpage-1	**Webpage-2**	**Webpage-3**

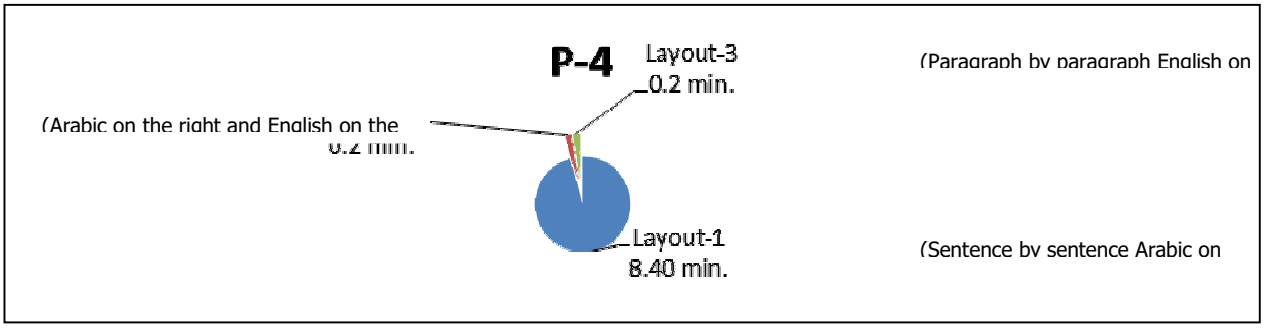


Figure 130 Participant 4 Eye Tracking Experiment Results

II) During the participants' interviews, the interviews were not limited to the interview questions exactly, but the researcher could guide the participants and redirect them without being biased.

III) The data results were built and created on real human experience that gives the data a powerful special distinction and make them more convincing.

- The use of themes and sub-themes, as well as the use of colours in the diagrams and tables in the analysis of the participants' interviews provide more understanding of the results collected.
- The implementation of the eye tracking experiment and the use of the eye tracker in this research make it current and state-of-the-art research in HCI.
- This research could be used as a step towards bridging the digital divide in New Zealand among Arabic speaking migrants and newcomers. Hence at the WSIS that will be held in 2015, this research could be used by the government since the summit will be assessing each nation's steps towards the Plan of Action agenda that was set by previous summits in 2003 and 2005.

Table 48 shows a summary of the limitations and delimitations; and strength of this research.

Table 48 Limitations, Delimitations, and Strengths of this Research

Research Limitations & Delimitations	Research Strength
Delays: - The construction of the online websurvey website. - Approaching the participants. - The Refugee Services unhelpfulness. - To obtain the eye tracker.	- This research contributes to the body of knowledge about Arabic speakers' preferences for paralingual webpage layout. - The mixed method methodology added more reliability to the results. - Time was used in the eye tracking experiment as a unit of analysis. - The participants' interviews provided detailed information. - The obtained results were built from human experience.
Participants: - The sampling size of the online websurvey. - Small number of women participating in the eye tracking experiment. - Travelling time to perform the eye tracking experiment.	
Research Framework: - Omitting the preliminary study framework to further research.	

	- The use of themes and sub-themes; and the use of colours in the diagrams in the interviews analysis provided more comprehensive understanding of the results. - The use of the eye tracker in this research considered an up-to-date research technique in HCI. - This research could be part of the Plan of Action of New Zealand's contribution in WSIS 2015.

8.5. Further, Future, and Development Research

This section contains areas of further, future and development research with regards to the Arabic speakers using paralingual websites design, displaying English and Arabic languages. They are summarised in the following:

- The research objective and aim is to ascertain Arabic speakers' preference for a paralingual website layout. The results show that the preference paralingual website layout is Layout 2 as shown in Figure 130, Arabic translation on the right and English text on the left. A possible development of further or future research is to allow the users of an actual paralingual website to choose their preferred layout among three different layouts as shown in Figure 131.

Layout 1

Welcome to the new website for Auckland Regional Migrant Services (ARMS).
مرحبا بك في الموقع الجديد لأوكلاند الإقليمية لخدمات المهاجرين
Starting a new life in another country can be very hard, especially when you're
بدء حياة جديدة في بلد آخر يمكن أن يكون صعبا جدا، وخصوصا
unfamiliar with the culture, language and work environment. If you're new to Auckland, ARMS can help.
عندما تكون غير متأقلم مع الثقافة واللغة وبيئة العمل. لذلك إذا كنت جديدا في أوكلاند، يمكننا المساعدة.

Layout 2

Welcome to the new website for Auckland Regional Migrant Services (ARMS). Starting a new life in another country can be very hard, especially when you're unfamiliar with the culture, language and work environment. If you're new to Auckland, ARMS can help.	مرحبا بك في الموقع الجديد لأوكلاند الإقليمية لخدمات المهاجرين بدء حياة جديدة في بلد آخر يمكن أن يكون صعبا جدا، وخصوصا عندما تكون غير متأقلم مع الثقافة واللغة وبيئة العمل. لذلك إذا كنت جديدا في أوكلاند، يمكننا المساعدة.

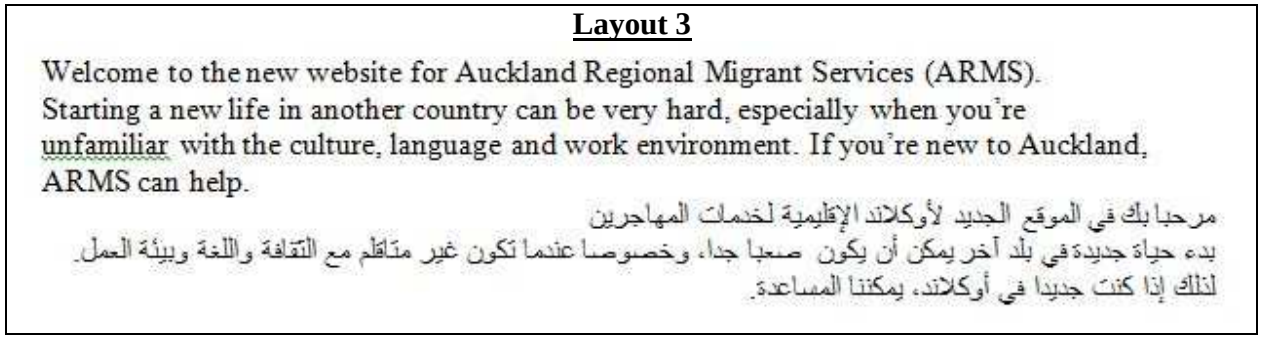


Figure 131 Different Paralingual Website Layouts

- The initial plan of this research was to discover and use the Arabic speakers' preferred layout - Layout 2, as shown in Figure 130. A part of a further research would be to implement Layout 2 into an actual e-government website, then use a survey to gather users' feedback of the usability of this website.
- One of the limitations of this research was the sampling size used in the online websurvey of Phase-1 which was twenty nine participants. Further research would be to test with a larger sampling size and with a new research framework, such as including a translation process for an e-government website with the implementation of paralingual design. Matamoros (2009) mentions three language translation technologies, or translation development, as discussed in the literature review in Section 2.5.1.1. These technologies consist of: Terminology Management Systems (TMS); Translation Memory (TM); and Machine Translation (MT). Konečý (2006) provides a diagram presented in Figure 12 in Section 2.5.1.1 showing how to obtain a Computer Assisted Translation (CAT).

8.6. Chapter Eight Summary

Section 8.2 is the discussion that recaps the objective of this research; this research knowledge in accord with the literature review; and answers to the research questions.
Section 8.3 interprets the results and presents the findings that consists of: the results, and the findings.
Section 8.4 consists of the research limitations, delimitations, and strengths.
Section 8.5 consists of further, future, and development research.

8.7. Next Chapter

The next chapter is Chapter 9 is the recommendations and conclusion, a summary of: the research themes and answers to the research questions; the methodology used to answer the research questions; original contribution to knowledge; limitations and their effect on this research; and further research.

Chapter Nine: Recommendations and Conclusion

9.1. Introduction

This chapter consists of two main sections - the recommendations of this research, and the conclusion. The recommendation section consists of suggestions and ideas introduced or originated in Chapter 8 the discussion and the findings of this research. The conclusion consists of main key points that would interest the reader who has been exposed to them during the research.

9.2. Recommendations

It is important to show how the research's results support the recommendations by stating what needs to be done; the process required to fulfil them; and the resources required to do so (Papermaster, 2014).

The following are recommendations to governmental and non-governmental organisations based on the results obtained and gathered after conducting the data collection of this research:

1. The Mangere Refugee Resettlement Centre (MRRC)

The MRRC is located at 251 Massey Road, Mangere, Auckland, New Zealand. This resettlement centre houses the UN quota refugees and it is the first place or site for refugees as accommodation and as linking or connecting with society in New Zealand. They enter for six weeks for evaluation and training, most of the refugees have inadequate English to enable them understand important information.

Although the centre facilities include: *"accommodation blocks, a nursery, classrooms, medical and dental clinics, a dining area, a lounge and meeting room, recreational and sporting facilities, a clothing store, and administrative areas"* (Ministry of Health, 2012, p. 39), the centre does lack an ICT room area. Therefore, the recommendation is to allocate or build an ICT room area facility that includes a sufficient number of PCs for the needs of the refugees in the centre. The software should include paralingual web design in several - or many - languages to serve the residents/citizens of the centre.

The results of this research show that the majority of the online websurvey participants and the interview participants support paralingual web design in its use as

an educational tool, and to increase trust in government. Therefore, the implementation of a paralingual web design would help the refugees:

- To use it as an educational tool, by translating, introducing, and teaching them important terms and expressions used in New Zealand;
- Informing the refugees of important facts regarding settlement, employment, health care, education and schools for their children; and
- Establish trust in the government, build confidence in it, and introduce them to their new home and society, and ease their worries.

2. Ministry of Health Pregnancy and Maternity Services

The provision of paralingual websites would help Arabic speaking women to be educated and informed about the pregnancy and maternity services available to them in New Zealand.

The results of the online websurvey show that there was a high number of women participation - very close to the number of males. Therefore, the implementation of a paralingual web design would help Arabic speaking women refugees to:

- Ease the burden of single refugee women caring for a big family without the backing and care of extended family;
- Ease the adjustment of the changing role of women within the family from housewife to main source of income;
- Educate refugee women of their rights and new status, where some women may formerly have held no status; and
- Help ease isolation of living in a new society - New Zealand.
- Educate and inform refugee women about many health, pregnancy and maternity issues, such as immunisation and vaccinations necessary for infants' health.

9.3. The Conclusion

This subsection consists of a summary of the following six sub-Sections:

- What the research is about and the answers to the research questions;
- The methodology used to answer the research questions;
- The results and analysis of this research;

- Original contribution to knowledge;
- Limitations and their effects on this research; and
- Further research.

9.3.1. The Research's Themes, and Answers to the Research Questions

This research's objective was to investigate and test Arabic speakers' preference for different paralingual webpage layouts. According to Segovia et al. (2009), paralingual web design is the display of more than one language on the same webpage. Sections 1.5, 8.2.2, and 8.3.2.4 contain information regarding paralingual web design and its origin.

Paralingual web design could be used to reduce the digital divide in the New Zealand society by helping newcomers such as international students, refugees, and immigrants get access to important and vital information that are available on e-government websites as part of the Information Society facility; and to overcome any inadequate English language proficiency.

Such a provision is categorised as a localization process, where a product such as a governmental website is made linguistically and culturally appropriate to local residents within the society. Section 2.3.4 contains more information regarding localization.

Parenthetically, this research is considered a community informatics project supporting the Information Society facilitations in the form of information available on governmental websites, by helping users to fulfil and accomplish their societal needs by using ICT in the comfort of their homes.

The research was designed to answer the following three research questions:
Q 1. What obstacles prevent Arabic speaking migrants from being online and having access to e-government in NZ?
Q 2. What paralingual layout do the majority of Arabic speaking migrants prefer when browsing e-government in NZ?
Q 3. What are the benefits of a paralingual e-government website in NZ for Arabic speakers?

The answers to the research questions are available in Section 8.2.3, and Section 8.3.2.1. The following is summarised answers to those research questions:

- The hypothesis of this research is that inadequate English language proficiency is an obstacle to newcomers such as international students, refugees and immigrants. Therefore, this discourages them from accessing important information on e-government websites that only use the English language.
- The answer to Q 1 is the English language barrier; and monolingual E-government websites. This was obtained from the results of the online websurvey questionnaire, and the results of participants' interviews following the eye tracking experiment.
- The answer to Q 2 is Arabic on the right and English on the left is the Arabic speakers' preference as a paralingual web design, obtained from the online websurvey questionnaire; the eye tracking experiment; and the participants' interviews.
- The answer to Q 3 is Paralingual websites are easier to read; Paralingual websites could be used as an educational tool; and Paralingual websites would create trust in the government, the results obtained from the online websurvey; and the participants' interviews.

9.3.2. The Methodology used to Answer the Research Questions

The methodology is the mixed and triangulation method consisting of three phases for data collection: the online websurvey; the eye tracking experiment; and the participants' interviews. Chapter 3 and Section 8.2 contain the detailed information on the three methods. The online websurvey and the eye tracking experiment are quantitative methods, whereas the participants' interviews method is a qualitative method.

9.3.3. The Results and Analysis of this Research

The description of the methods used and the results of the **online websurvey** are available in Chapter 4. In general the research shows that the majority of Arabic speakers prefer a paralingual webpage layout, presenting the Arabic translation on the

right and the English text on the left; and that economic and cultural aspects do not prevent Arabic speakers' from accessing the Internet, but inadequate proficiency in the English language discourages them from accessing e-government websites.

The description of the methods and results of the **eye tracking experiment** are available in Chapter 5. These results show that Arabic speakers prefer a paralingual webpage layout paragraph by paragraph with the English text on top and the Arabic translation below it; and the participants' reading behaviour is also revealed and analysed.

The description of the methods and the results of the **participants' interviews** are available in Chapter 6. Here, the results show the advantages of paralingual web design; and that the majority of Arabic speakers solely prefer the Arabic on the right and the English on the left; and that the inadequate level of English language proficiency is behind the low rate of e-government access.

The analysis of the collected results is available in Chapter 7. Themes, bars, and diagrams were used to help analyse the results that were collected in Chapters 4, 5, and 6.

9.3.4. Original Contribution to Knowledge

This research adds to our knowledge the following insights and serviceable analysis of societal behaviour:

- Arabic speakers' preference for different paralingual webpage layouts. The results show that the majority of Arabic speakers' prefer a paralingual layout with Arabic translation presented on the right with the English text presented on the left; this could be due to the fact that Arabic is written from right to left, whereas English is written from left to right;
- Paralingual web design could be used as an educational tool to learn the meaning of difficult words in English;
- Arabic speakers' reading behaviours as they were revealed by the eye tracking experiment; and
- The advantages of paralingual web design.

9.3.5. Limitations and their Effect on this Research

Section 8.4.1 contains a detailed description of the limitations of this research. The following is a summary of the limitations:

- Low number of women in sample for eye tracking and interviews;
- Total size of participation not very big for online survey. It means the results a bit constrained in their application level; and
- Low rate of refugees – too low for conclusions to be drawn about their experiences. The low rate due to their status fragility in New Zealand as residents.

9.3.6. Further Research

Section 8.5 contains a full detailed description of further research. There has been a recommendation based on the results obtained, that further research could include a project to have the three most preferred paralingual layouts being available on a governmental website that enable users to choose the desired paralingual design they most prefer.

9.4. Chapter Nine Summary

Section 9.2 consists of the recommendations.

Section 9.3 is the conclusion that consists of: the themes and answers to the research questions; the methodology used; the results and analysis; original contribution to knowledge; limitations and their effect; and further research.

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Appendix A Literature Classification

Appendix A Literature Classification

Significant Literature			
Themes	**Main contributions**	**References**	**Further Work**
Arabic Speakers Characteristics			
The Arabic language characteristics	Arabic Speakers characteristics, their status, and their living conditions in New Zealand. Writing systems, Abjads consists of Hebrew and Arabic and they are written from right to left.	(Kadri, 2009), (Ghosh, et al., 2009)	Include longitudinal study to allow the process of resettlement to develop, and conduct a follow up or satisfaction survey.
Modern Standard Arabic (MSA)	Classical written Arabic, Modern Standard Arabic (MSA) or Fus'ha, and spoken Arabic. Newspapers samples have been gathered from Arab countries to compare the language used in these different countries, the data was used to produce an analysis of the facts of localization.	(Abdelali, 2004)	More intensive investigation is needed to discover the full scope of localization in MSA. The next step is to investigate different types of resources.
The Cultural Characteristics	Scholars who have discussed Arabic Speakers' cultural characteristics used Hofstede' model. Most Arabic Speakers' religion is Islam and it is embedded in their daily living as culture. A different culture requires different designs, which requires different advertising approaches. Hofstede's model did not reflect Arabic Speakers characteristics design. Culturability is a term used to relate culture to usability in websites design; therefore design elements that are suitable for Arabic Speakers may not be suitable for speakers of other languages.	(Hashim, et al., 2007), (G. H. Hofstede, 2001), (Callahan, 2006), (Khashman & Large, 2010), (Barber & Badre, 1998), (Al-Badi, 2009), (Hemayssi, et al., 2005), (Abdul Rahim, et al., 2007) (Fraternali & Tisi, 2008), (Mushtaha & De Troyer, 2009)	Muslims' believes very much controls their behaviour online, for example the majorities do not gamble, or enter x-rated websites. This can be investigated in more details.
The Digital Divide			
Origin of DD	First mentioned in the mid 1990s	(Selwyn & Facer, 2007)	The issues mentioned in the past, still exists today
Definitions	Using ICT to measure and predict Internet usage. Language digital divide. People who lack access to the Internet to conduct daily activities are at a growing disadvantage.	(Donat, Brandtweiner, & Kerschbaum, 2009) (Y.M. Kouadio, 2008), (Abd Rozan, Mikami, Abu Bakar, & Vikas,	Language digital divide is one of the many digital divides that exist in cyberspace. The challenge to deliver the World Summit on the

	Helpful insights for policy makers and related stakeholders.	2005), (King, 2008), (Lei, Gibbs, Chang, & Lee, 2008), (Pick & Azari, 2008)	Information Society's declaration of principles (2003&2005) to be evaluated by 2015.
Indicators	Digital Opportunity Index and Digital Access Index.	(Arnold, 2005; Chinn & Fairlie, 2004), (Te Ara Encyclopedia of New Zealand, 2009), (The UN Refugee Agency (UNHCR), 2008)	Rich countries can satisfy these indicators, but the challenge is to come up with new indicators for poor ones.
DD in NZ	Examines the 1980s which produced societal changes for Māori in New Zealand. Indigenous people see IT as a means of preserving their culture for future generations. Relationship guidelines to help NGOs and communities to work well together.	(G. H. Smith, 2003) (Stevenson & Callaghan, 2008) (Dyson, Hendriks, & Grant, 2007) (Change Makers Refugee Forum, 2008), (New Zealand Immigration Service, 2004), (O'Neill, 2009)	The digital divide still exists due to factors such as: technological between rural-urban, social cultural differences, economic due to low income or unemployment, and political not making ROI.
The HCI & WUI			
History	HCI emerged in the 1980s integrating several approaches. HCI emerged as a major discipline in computing. Overview of HCI including definitions and terminologies.	(J. Carroll, 2009; Jacko & Sears, 2003; Karry, Alemzadeh, Abou Saleh, & Nours, 2008)	HCI today and in the future will be used in every aspect of our lives. Whereas in the past HCI was only accessible to scientists.
Interrelationships	Four topics interrelated with HCI demonstrated in Fig (3) and table (4)	(Association for Computing Machinery Special Interest Group on Computer-Human Interaction (ACM/SIGCHI), 2008)	More projects are needed such as eye-tracking and sound recognition.
Cultural, multilingual, & Ethical issues	Important issues need to be considered when designing for a particular culture (Al-Badi, 2009). ICT can serve to limit as well to liberate, to unite as well as to scrap. It is considered ethical to consult with users and stakeholders when conducting research in HCI discipline (Hamada, 2002). Ethical issues Byrne and Alexander (2006). Indigenous language usage in a bilingual interface.	(Abd Rozan, et al., 2005 ; Al-Badi, 2009; Bilal & Bachir, 2007; Hisham & Edwards, 2007) (Hemayssi, et al., 2005) (Hamada, 2002) (Hsieh, Rai, & Keil, 2008) (E. Byrne & Alexander, 2006), and (Keegan, Cunningham, & Apperley, 2007)	More studies needed in order to understand Middle Eastern culture to promote the use of ICT among Arabic speakers worldwide.
HCI Projects	Describes some of the problems and challenges that need to be explored. Main motivations behind	(Belkredim & Sebai, 2009; Bell, et al., 2008; Bell, et al., 2007;	Kabbar and Crump (2007) do not make a distinction between

	designing machine translation. World Internet Project providing surveys. A study of refugees and immigrants and usage of ICT (Kabbar & Crump, 2007). Language Observatory Project (Mikami et al., 2005). Microsoft NZ released a Māori language pack for Microsoft Vista as a no cost download (Scoop, 2009b).	Harkus, 2007; Hartmann, Wu, Collins, & Klemmer, 2007; Holmes, 2004; Kabbar & Crump, 2007; Kumar, Kim, & Klemmer, 2009; Mikami, et al., 2005; O'Neill, 2009; Razavian & Vogel, 2009; Sahama, Ho-Stuart, & Hogan, 2004; Savarimuthu & Purvis, 2004) (Halawani, 2008) (Lee, Papineni, Roukos, Emam, & Hassan, 2003) (Scoop, 2009a 2009b), and (Shneiderman & Plaisant, 2005)	immigrants and refugees. At present there are search engines in Arabic language such as Google as well as machine translation software.
Web & Document layout	Oliveira's (2008) paper describes two approaches to the problem of automatically placing document items on pages of some output device (Oliveira, 2008). Several directions that may help the computerization of minority languages are discussed (Berment, 2002). This paper outlines issues related to two important aspects of the problem: content and structure. Several representative Web sites are examined to illustrate some of these considerations (Huang & Tilley, 2001). Web pages such as news and shopping sites often use modular layouts. When used effectively this practice allows authors to present clearly large amounts of information in a single page (Revilla & Crow, 2009). Schrier et al. (2008) presents a system for designing and displaying grid-based document designs that adapt to many different viewing conditions and content selections (Schrier et al., 2008).	(Oliveira, 2008), (Berment, 2002), (Huang & Tilley, 2001), (Revilla & Crow, 2009), (Schrier, Dontcheva, Jacobs, Wade, & Salesin, 2008), (Gottorn & Martin, 2009), (Ishihara, Takagi, Itoh, & Asakawa, 2006), (Lumley, Gimson, & Rees, 2005), (Milo, 2006), (Jacobs, Li, Schrier, Bargeron, & Salesin, 2004)	This section contains very important articles in regards to web layout and document layout. Some of the articles show techniques needed to present a suitable website according to required specification. One gap exists: there has not been an article describing localization or bilingual websites layout in Arabic.
Tools &	HCI & WUI provide tools and techniques that makes designing certain layouts and collecting important data possible		

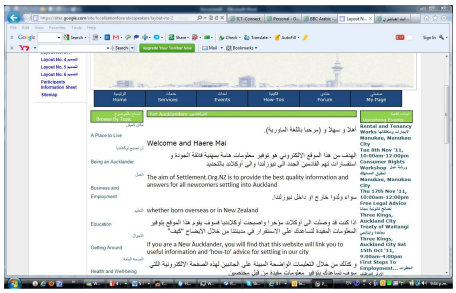
Appendix A Literature Classification

Techniques			
Eye Tracking	Eye tracking research is used in commercial and academic on a large scale in many disciplines. Data from using eye tracking related to bilingual research is still very modest. Certainly, the technique of using eye tracking to establish an argument for which layout participants choose, has not been attempted. There is a mention in the literature of web usability problems from eye tracking data. An experimental research designed for people with severe disabilities (Chau & Betke, 2005). Eye tracking (ET) adds another dimension. Watching what people are looking at adds a level of interest to usability studies (Pernice & Nielsen).	(Blumenfeld & Marian, 2005; Chau & Betke, 2005; Ehmke & Wilson, 2007; Nakayama & Archibald, 2005; Villanueva, et al., 2008b; Weinreich, Obendorf, Herder, & Mayer, 2008), (COGAIN, 2009), (Daunys & Vysniauskas, 2009), (Novāk, et al., 2009), (PtgGlobal, 2009), and (Pernice & Nielsen, 2009).	"The many personal differences and user habits indicate the need for future browsers to become even more adaptable" (Weinreich et al., 2008). "An ultimate goal could be to use such a scheme as the basis for automated analysis of eye-tracking data in the context of usability evaluation. However, further research is required before this can be realised" (Ehmke & Wilson, 2007). "The current advances in eye tracking and the increasing number of researchers working in the field will make widespread low-cost eye tracking to become a reality in the future" (Villanueva et al., 2008).
XHTML, HTML, and CSS. Entities, LANG attribute, and Font size.	World Wide Web Consortium (W3C) created HTML and CSS standards.	(Ishida, 2004, 2009a, 2009b; Nelson, 2008, 2009), (Yassin, 2009), (Alsumait & Al-Osaimi, 2009)	XHTML is very similar to HTML. You need to be careful when using machine translation software.
Localization	Concepts of internationalization and localization. Globalization cycle.	(Wang, Zhang, Xie, Mei, & Sun, 2009) (Barbour & Yeo, 1997; Brandon, 2001; Hong, 2001; M. Kaplan, 2000; Matamoros, 2009; Michels, 2006; Nelson, 2008) (The Localization Industry Standards Association (LISA), 2009)	This project has not been attempted or conducted in New Zealand before. Usually machine translation software does not take into consideration cultural and religion issues. Therefore, a culture expert is required in similar projects.

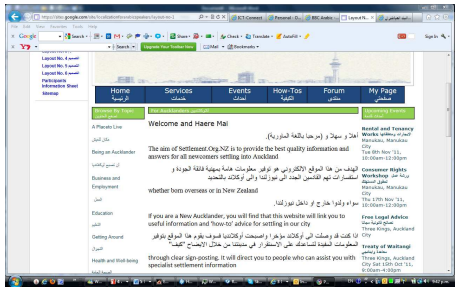
Appendix B Different Paralingual Webpage Layouts of Online Websurvey

Appendix B Different Paralingual Webpage Layouts of Online Websurvey

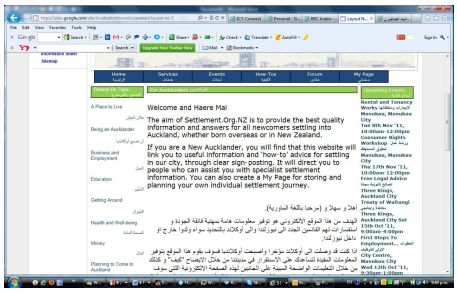
http://sites.google.com/site/localizationforarabicspeakers



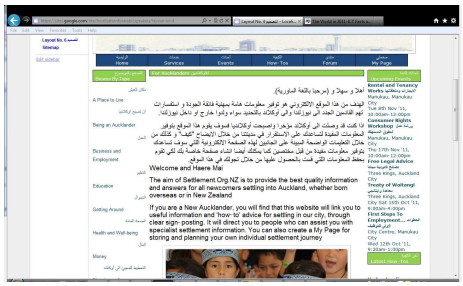
Layout 1



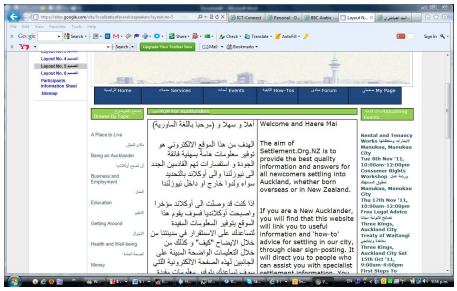
Layout 2



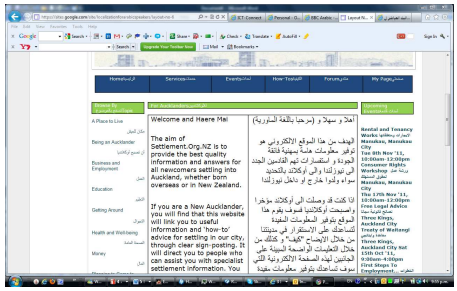
Layout 3



Layout 4



Layout 5



Layout 6

Appendix C Web Survey's Questionnaire

Q 1. Please choose your preference layout from the following six figures:
○1 ○2 ○3 ○4 ○5 ○6

Q 2 Tick the reason or reasons made you make your choice in Q 1:
☐ Easy to read and understand the English text and its Arabic translation.
☐ Helped me learn new vocabulary.

Q 3 Displaying English text with its Arabic translation of e-government websites will encourage me to look for information online more often:
○Yes ○No

Q 4 How important is it for you to have Arabic translation displayed with the English text on the same page? Choose from 1-5, where 1 is least important and 5 is most important
○1 ○2 ○3 ○4 ○5

Q 5 Where do you live?
○ In New Zealand ○ Out of New Zealand

Q 6 How long have you lived in New Zealand?
○1-3 ○3-5 ○5-10 ○10 and up

Q7 State the city you live in?

Q 8 What age group would you say you belong?
○Under18 ○18-24 ○25-40 ○40 and up

Q 9 What is your country of origin?

Q 10 Are you an Immigrant or Refugee?
○ Immigrant ○ Refugee ○ International Student ○ Others

Q11 How long do use the Internet daily?
○1-2 ○3-5 ○5-10 ○ more than 10

Q 12 Do you have Broadband connection at home?
○ Yes ○ No

Q 13 Do think is it important to have Internet connection at home?
○ Yes ○ No

Q 14 Do you have a PC at home?
○ Yes ○ No

Q 15 Are you Employed?
○ Yes ○ No

Q 16 What is your gender?
○ Male ○ Female

Q 17 How long in years would you say, you have been using computers?

Q 18 Would you like to comment on this survey?

Q 19 The results of this research are subject to publications

Appendix D Implications Drawn of International Student's Results

Appendix D Implications Drawn of International Students' Results

Table 1 International students' results

No	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19
1	3	1	1	5	1	1	Auk	2	SA	2	1	1	1	2	Fe	<8y	☺	✓
2	3	1	1	5	1	1	Ham	3	SA	2	1	1	1	2	Ma	12y	☺	✓
3	3	1& 2	1	5	1	3	Auk	2	Om	3	1	1	1	2	Fe	6y	☺	✓
4	6	1	2	3	1	2	Ham	3	SA	2	1	1	1	2	Ma	14y	☻	-
5	1	1	1	4	1	1	Auk	2	Om	2	1	1	1	2	Ma	10y	-	-
6	3	1	1	2	1	3	Chr	2	Om	2	1	1	1	2	Ma	10y	-	-
7	3	1	1	3	1	1	Ham	3	SA	2	2	1	1	2	Ma	8y	-	-
8	4	1	1	5	1	2	Ham	3	SA	2	1	1	1	2	Ma	12y	☺	✓
9	6	1& 2	2	2	1	2	Ham	3	SA	3	1	1	1	2	Ma	12y	☺	-
10	6	1	1	3	1	1	Ham	2	Om	2	1	1	1	2	Ma	13y	-	-
11	6	1	1	5	1	2	Ham	3	SA	3	1	1	1	2	Ma	14y	☺	✓
12	6	1& 2	1	5	1	1	Auk	1	Pal	2	1	1	1	2	Ma	7y	-	-

Based on the results shown in Table 1 the following implications were drawn:

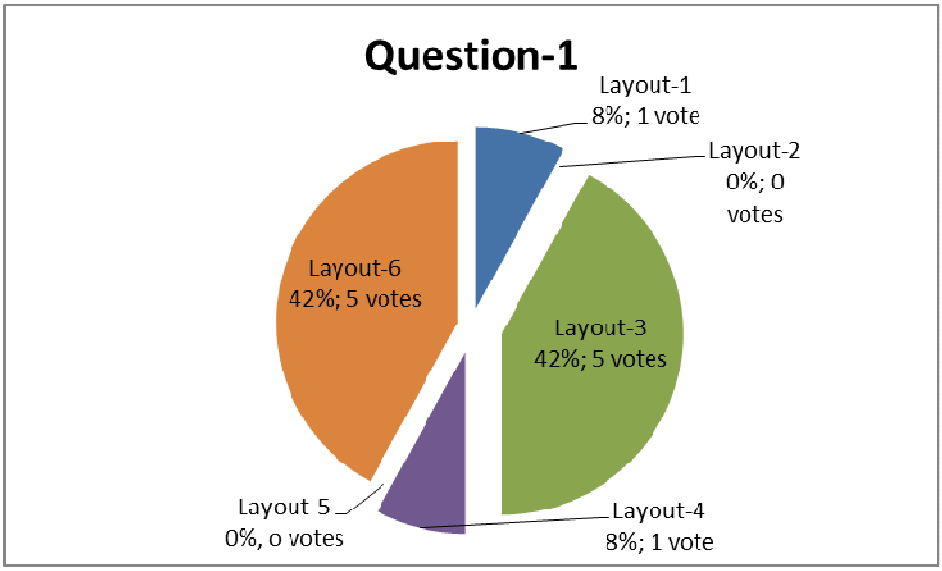


Figure 1 International Students' Results of Question 1

Question 1: as shown in Figure 1, forty-two percent of the participants selected layout three; forty-two percent of the international students' participants selected layout six; eight percent of the international students participants selected layout one; and eight percent of the international students participants selected layout four. A copy of the different layouts is shown in Appendix B.

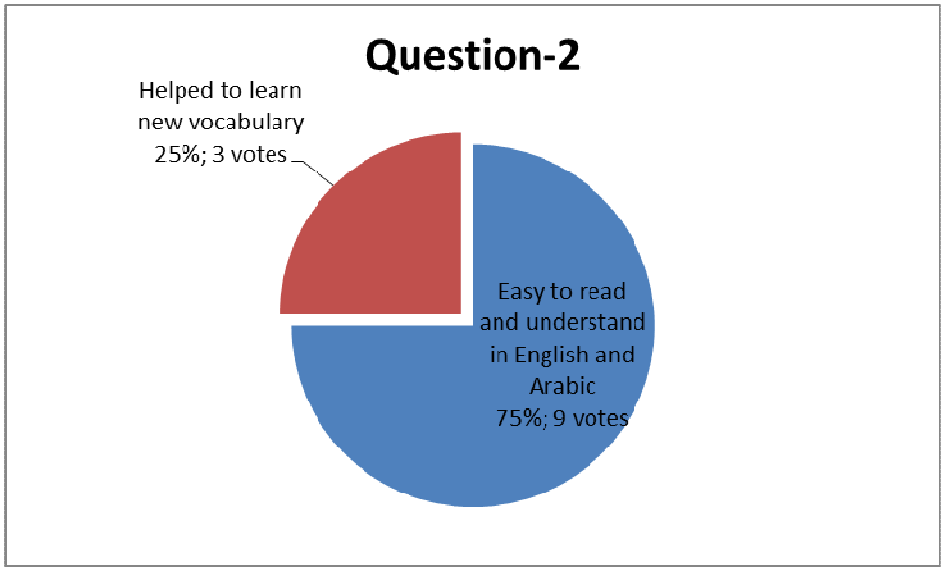


Figure 2 International Students' Results of Question 2

Question 2: as shown in Figure 2, seventy-five percent of the international students participated in the websurvey thought that their paralingual webpage layout that they have selected in question one was easy to read and understand in English and Arabic. Whereas twenty-five percent, thought that their paralingual webpage layout selection, which they have made in question one, helped them to learn new vocabulary.

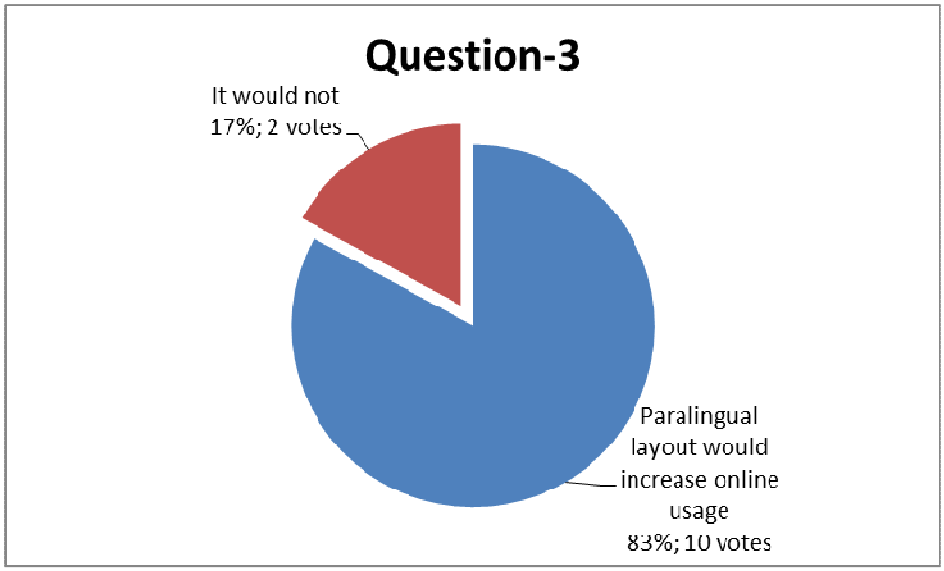


Figure 3 International Students' Results of Question 3

Question 3: as shown in Figure 3, eighty-three percent of the international students participated in the websurvey thought that paralingual webpage layouts would encourage them to look for information more often online. Where only seventeen

percent of the international students who participated in the websurvey thought that paralingual webpage layouts would not.

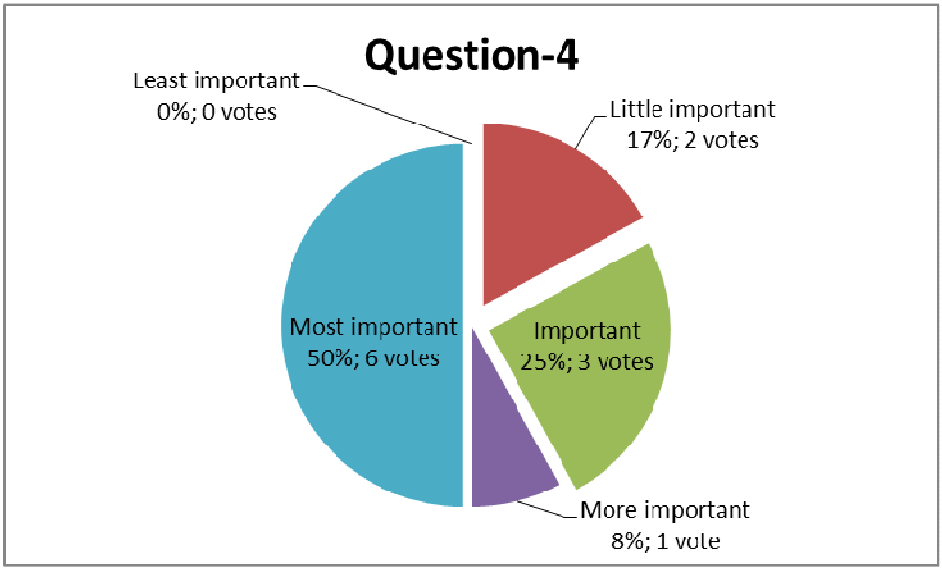


Figure 4 International Students' Results of Question 4

Question 4: as shown in Figure 4, fifty percent of the international students who participated in the websurvey thought that paralingual webpage layout was most important to have on a website. On the other hand, twenty-five percent of the international students who participated in the websurvey thought that paralingual webpage layouts are important on a website. Seventeen percent of the international students who participated in the websurvey thought that paralingual webpage layouts are less important on a website. Eight percent of the international students who participated in the websurvey thought that paralingual webpage layouts are more important on a website.

Question 5: all of the international students who participated in the websurvey were in New Zealand, and none of the international students who participated in the websurvey were out of New Zealand.

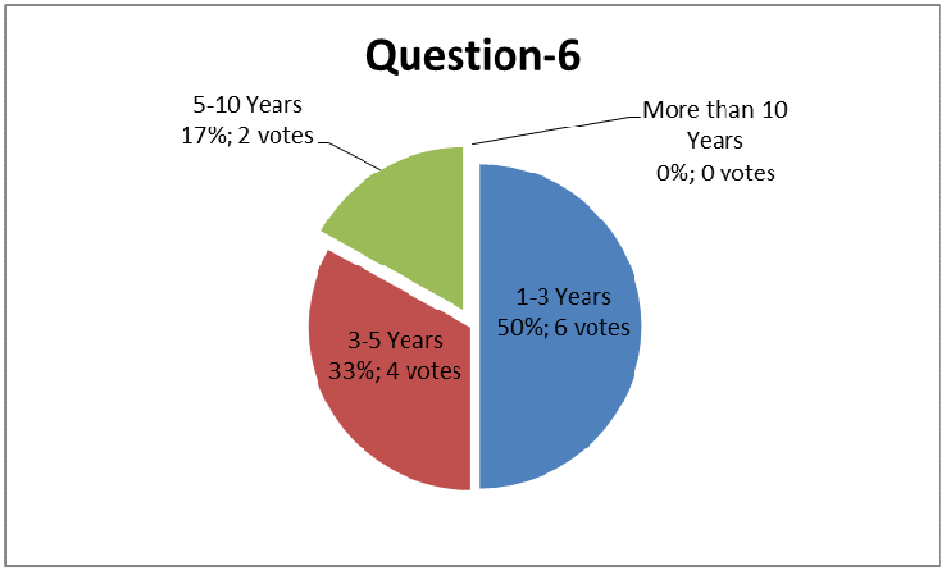


Figure 5 International Students' Results of Question 6

Question 6: as shown in Figure 5, fifty percent of the international students who participated in the websurvey have lived in New Zealand for one to three years. Thirty three percent of the international students who participated in the websurvey have lived in New Zealand three to five years. Seventeen percent of the international students who participated in the websurvey have lived in New Zealand for five to ten years.

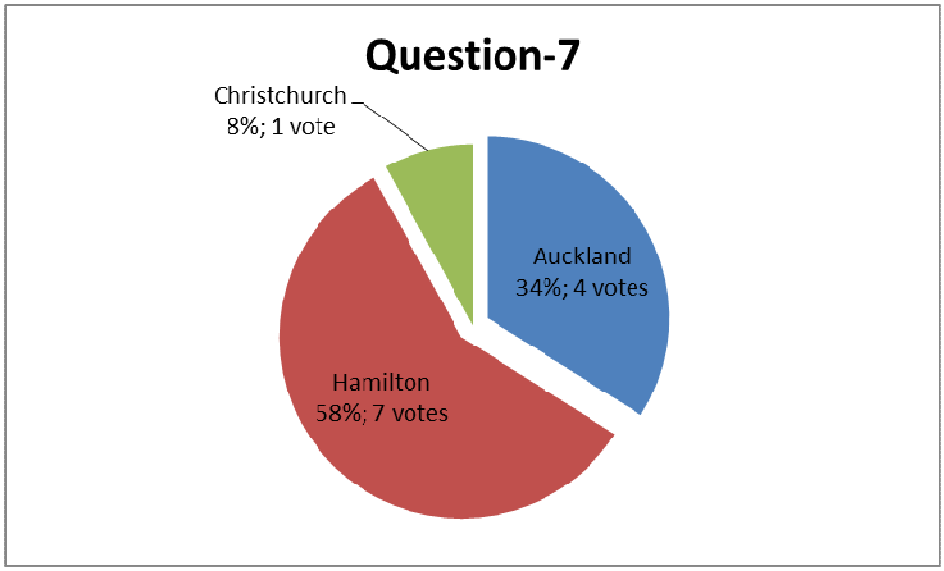


Figure 6 International Students' Results of Question 7

Question 7: as shown in Figure 6, fifty-eight percent of the international students who participated in the websurvey have lived in Hamilton at the time of the survey.

Thirty four percent of the international students who participated in the websurvey have lived in Auckland. Eight percent of the international students who participated in the websurvey have lived in Christchurch.

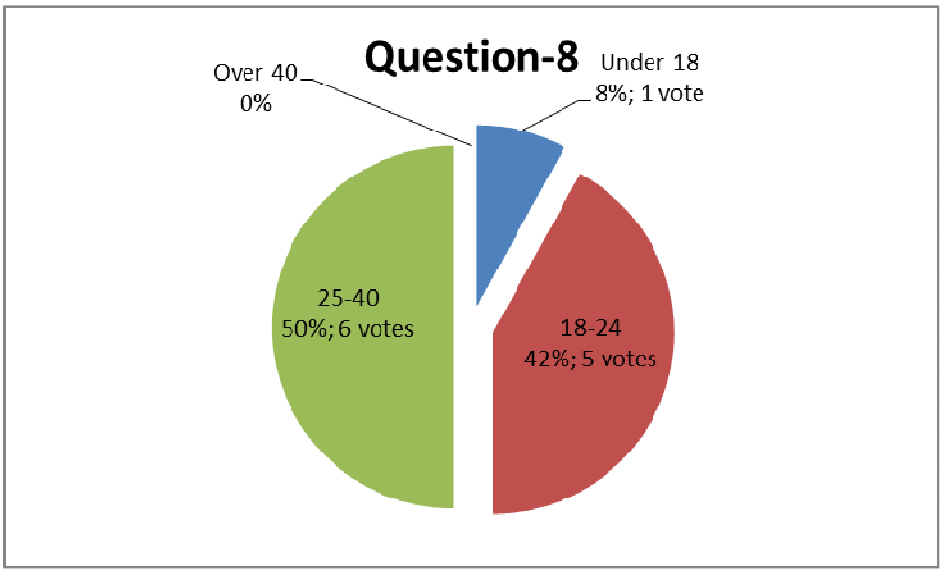


Figure 7 International Students' Results of Question 8

Question 8: as shown in Figure 7, fifty percent of the international students who participated in the websurvey belonged to the twenty-five to forty years old group. Forty two percent of the international students who participated in the websurvey belonged to the eighteen to twenty four years old group. Eight percent of the international students who participated in the websurvey were under eighteen years old.

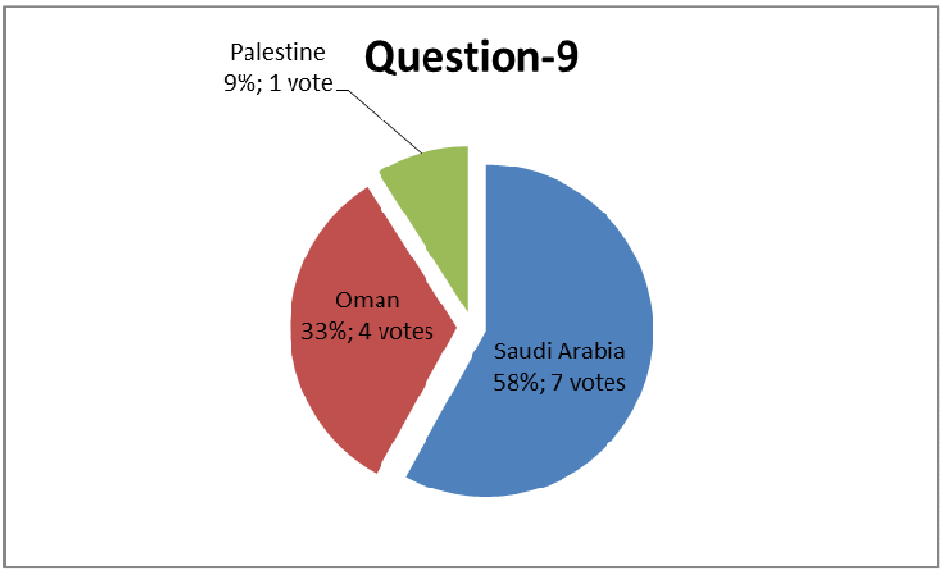


Figure 8 International Students' Results of Question 9

Question 10: as shown in Figure 8, fifty-eight percent of the international students who participated in the websurvey were from The Kingdom of Saudi Arabia. Thirty three percent of the international students who participated in the websurvey were from Oman. Nine percent of the international students who participated in the websurvey were from Palestine.

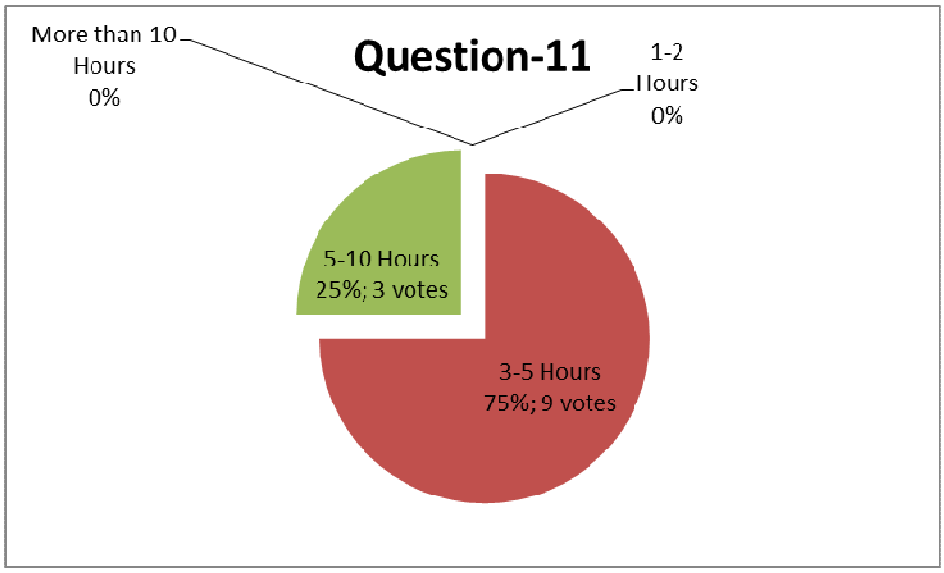


Figure 9 International Students' Results of Question 11

Question 11: as shown in Figure 9, seventy-five percent of the international students who participated in the websurvey spent three to five hours online daily. On the other hand, only twenty five percent of the international students who participated in the websurvey spent five to ten hours online daily.

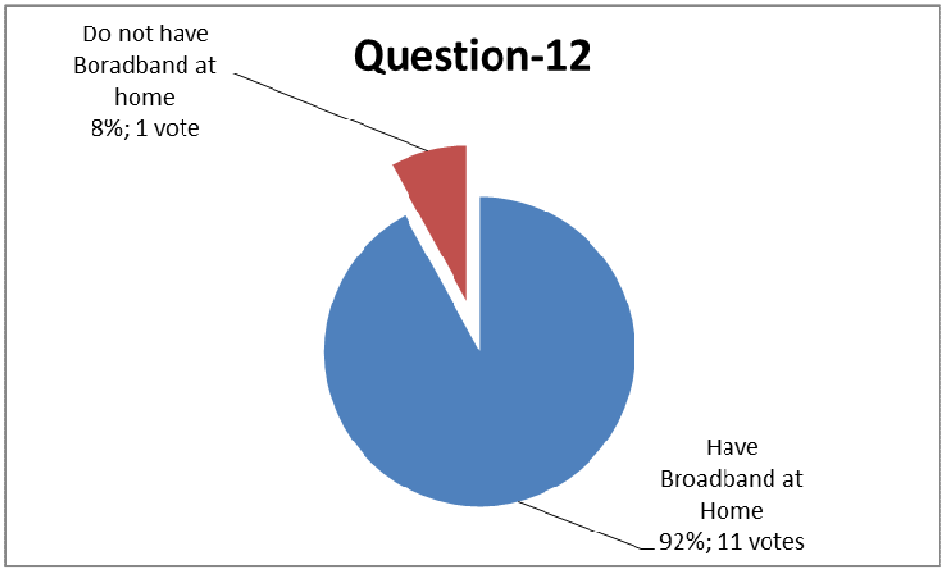


Figure 10 International Students' Results of Question 12

Question 12: as shown in Figure 10, ninety-two percent of the international students who participated in the websurvey had broadband connection at home, whereas only eight percent of the international students who participated in the websurvey did not.

Question 13: all international students who participated in the websurvey thought that it is important to have Internet connection at home.

Question 14: all international students who participated in the websurvey had a PC at home.

Question 15: no international students who participated in the websurvey were employed, because it is illegal to work without The Immigration's permission to do so.

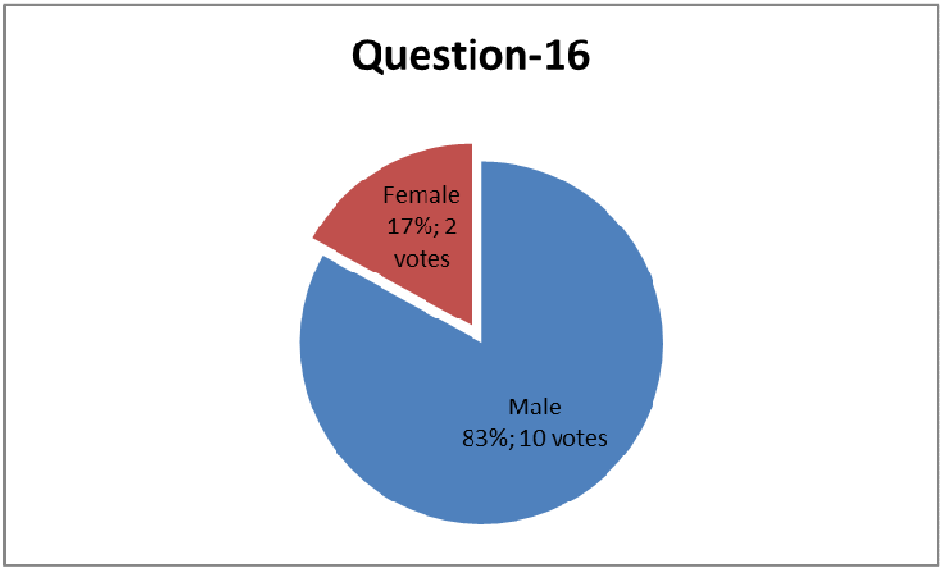


Figure 11 International Students' Results of Question 16

Question 16: as shown in Figure 11, eighty-three percent of the international students who participated in the websurvey were males. Whereas seventeen percent of the international students who participated in the websurvey were females, and all of them have selected paralingual webpage layout three.

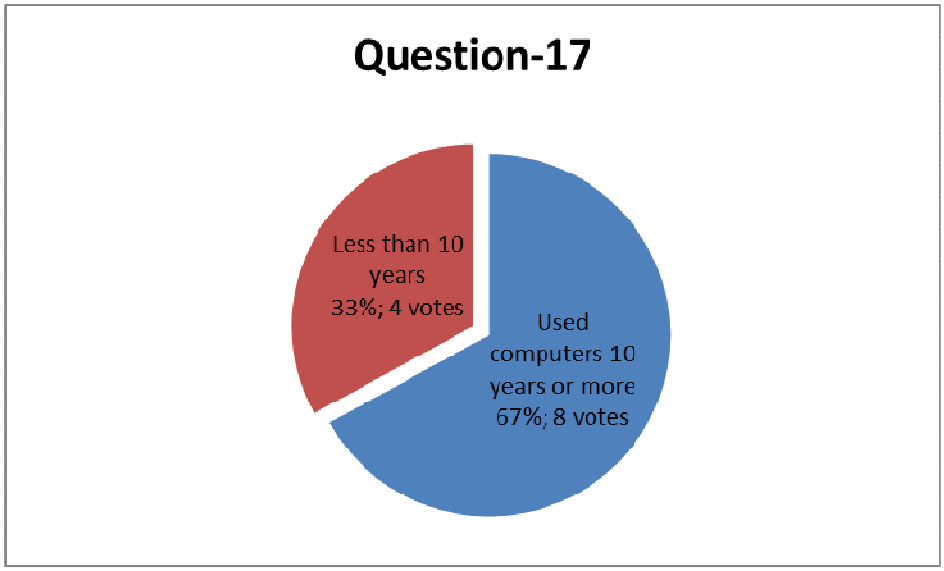


Figure 12 International Students' Results of Question 17

Question 17: As shown in Figure 12, sixty-seven percent of the international students who participated in the websurvey have been used computers for ten years or more, whereas thirty-three percent of the international students who participated in the websurvey have been using computers for less than ten years.

Question 18: fifty percent of the international students who participated in the websurvey have commented positively on the websurvey. Forty two percent of the international students who participated in the websurvey had not commented on the websurvey. Only eight percent of the international students who participated in the websurvey commented negatively.

Table 2 Feedback of International students' participants

Positive Feedback	Negative Feedback
Thank you for this survey..	
تمني لك التوفيق والنجاحif the website contain more information especially the important one like the immigration and how to connect in emergency and the law of the country I wish you success, and prosperity (Researcher's translation to comments in Arabic)	
The survey is honest and reliable.	as i'm a computer science student, i found that none of the provided layouts would be really good for this kind of website i'm

	really happy to participate in your survey and i wish you all the best kind regards
اتمني لك التفيق وتحقيق النتاج الطيبه I wish you success and obtain good results (Researcher's translation to Arabic comments)	
good lauck with this survey, may Gad will help you.	
It a good idea for displays English text with it is translation in Arabic in e-government websites.So people will try to look for further information.	

Table 2 contains a summary of some of the international student participants' feedback and comments on the websurvey.

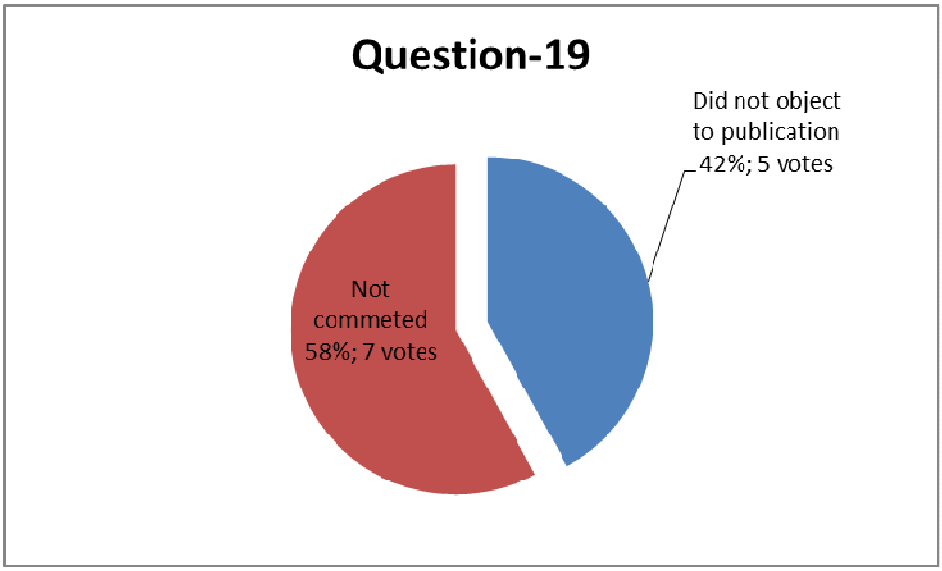


Figure 13 International Students' Results of Question 19

Question 19: as shown in Figure 13, forty-two percent of the international students who participated in the websurvey approved that the results of this research are subject to publications. On the other hand, fifty-eight of the international students who participated were natural.

Appendix D Implications Drawn of International Student's Results

Appendix E Implication Drawn of Immigrants' Refugees', and Others' Results

Table 1 Immigrants', refugees', and others' results

No	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	IS
1	6	1	1	5	1	4	Auk	4	Pal	1	1	1	1	2	Ma	16y	-	-	I
2	6	1	2	3	1	4	Auk	1	Pal	2	1	1	1	2	Fe	10y	-	-	I
3	6	1	1	2	1	4	Auk	4	Pal	4	1	1	1	-	-	-	-	-	I
4	6	1	2	5	1	4	Auk	4	Pal	2	1	1	1	-	-	-	-	-	I
5	2	1	1	5	1	4	Auk	4	Irq	3	1	1	1	1	Fe	9y	☺	✓	I
6	6	1	1	5	2	1	UAE	4	Pal	2	1	1	1	1	Fe	16y	☺	✓	I
7	6	1&2	1	5	1	4	Auk	4	Pal	2	1	1	1	2	Ma	5y	-	✓	I
8	3	1	1	4	1	4	Auk	4	Leb	2	1	1	1	1	Fe	15y	-	-	I
9	1	1	1	3	1	4	Auk	4	Irq	2	1	1	1	2	Fe	10y	-	-	I
10	6	1	1	4	1	4	Auki	4	Leb	2	1	1	1	1	Fe	13y	-	✓	I
11	3	1&2	1	3	1	3	Auk	4	Irq	1	1	1	1	1	Fe	15y	☺	-	I
12	2	1	1	5	1	4	Auk	4	Egp	1	1	1	1	1	Fe	10y	-	✓	I
13	6	1	1	5	1	4	Auk	2	Pal	2	1	1	1	1	Ma	10y	-	-	I
14	6	1&2	1	5	1	3	Auk	4	Irq	3	1	1	1	2	Fe	14y	☺	-	R
15	2	1	1	3	2	3	Om	2	Om	2	1	1	1	1	Ma	15y	☺	✓	O
16	2	1	2	3	2	1	Sing	4	Can	2	1	1	1	2	Fe	20y	-	-	O
17	1	1	1	4	1	3	Auk	4	Irq	2	1	1	1	1	Ma	12y	☺	✓	O

Table 1 consists of nineteen columns used to represent immigrants, refugees, and others responses to the websurvey questionnaire. Note that question ten is based on the participants' immigration status as a unit of analysis; therefore it was not taken into account, because it was already predetermined.

Based on the results shown in Table 1 the following implications were drawn:

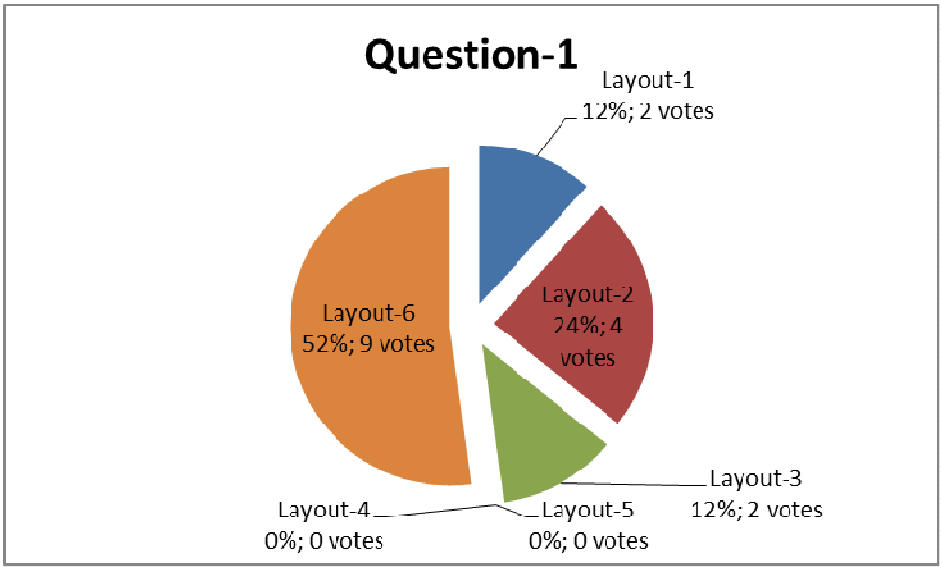


Figure 1 Immigrants', Refugees', and Others Results of Question 1

Question 1: as shown in Figure 1, fifty-two percent of the immigrants, refugees, and others who participated in the websurvey have chosen paralingual webpage layout six. Twelve percent of the immigrants, refugees, and others who participated in the

websurvey have chosen paralingual webpage layout three. Twenty-four percent of the immigrants and refugees who participated in the websurvey have chosen layout two. Twelve percent of the immigrants, refugees, and others who participated in the websurvey chose layout one. A copy of the different layouts is shown in Appendix B.

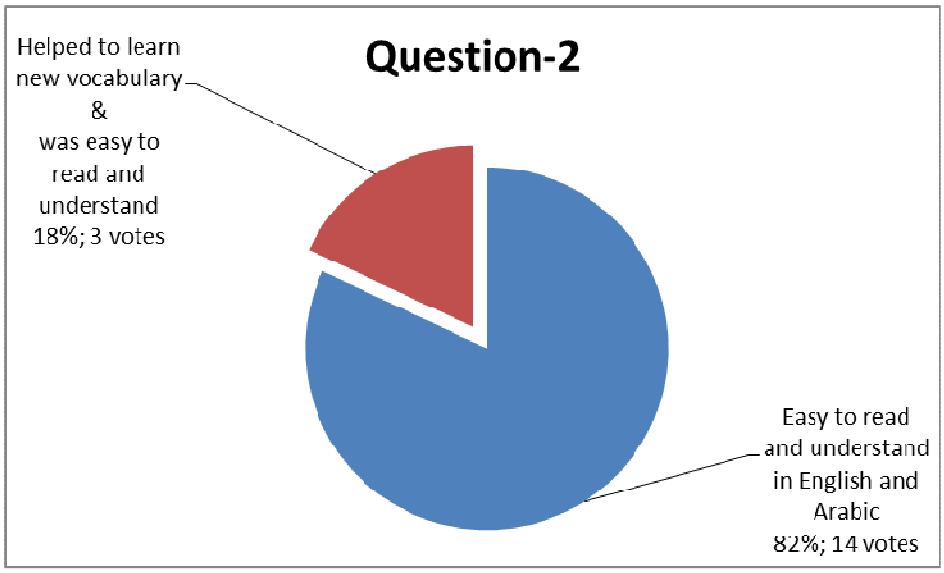


Figure 2 Immigrants', Refugees', Others' Results of Question 2

Question 2: as shown in Figure 2, eighty-two percent of the immigrants, refugees, and others who, participated in the websurvey thought that the layout that they had chosen question one was easy to read and understand in English and Arabic. On the other hand, eighteen percent of immigrants, refugees, and others who, participated in the websurvey thought that their choice in question one was not only easy to understand English and Arabic, but also it helped them learn new vocabulary.

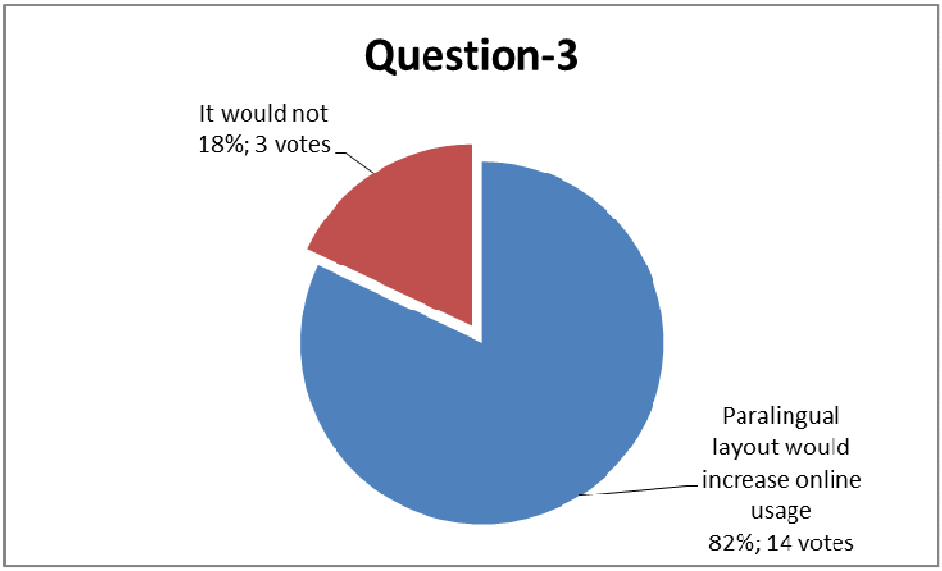


Figure 3 Immigrants', Refugees', Others' Results of Question 3

Question 3: as shown in Figure 3, eighty-two percent of the immigrants, refugees, and others who, participated in the websurvey thought that displaying English text with its Arabic translation would encourage them to look for information online. On the other hand, only eighteen percent of immigrants, refugees, and others who, participated in the websurvey did not think so.

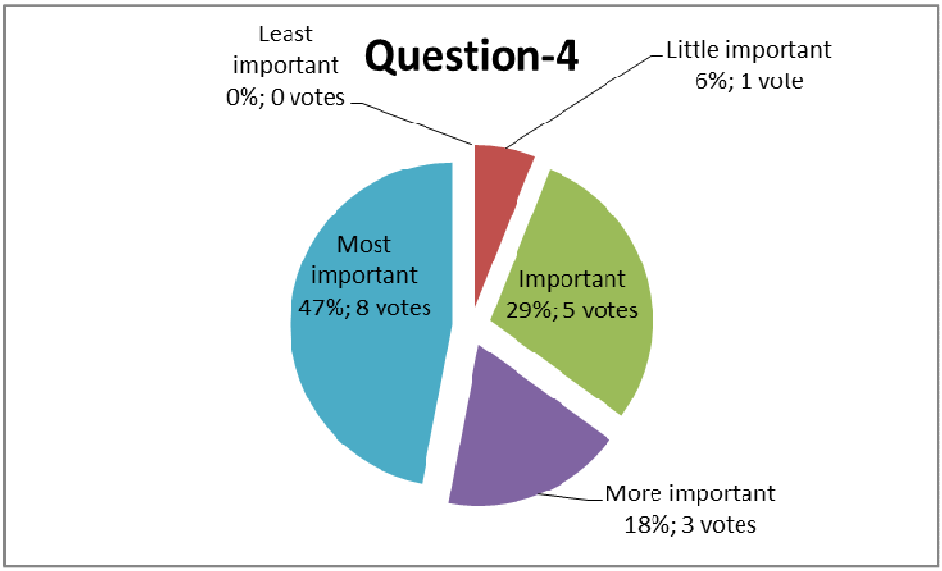


Figure 4 Immigrants', Refugees', and Others' Results of Question 4

Question 4: as shown in Figure 4, forty-seven percent of the immigrants, refugees, and others who, participated in the websurvey thought that a paralingual webpage layout is most important. Twenty nine percent of the immigrants, refugees, and others

who, participated in the websurvey thought that a paralingual webpage layout is important. Eighteen percent of the immigrants, refugees, and others who, participated in the websurvey thought paralingual webpage layout is more important. Six percent of immigrants, refugees, and others who, participated in the websurvey, thought that paralingual webpage layout has little importance.

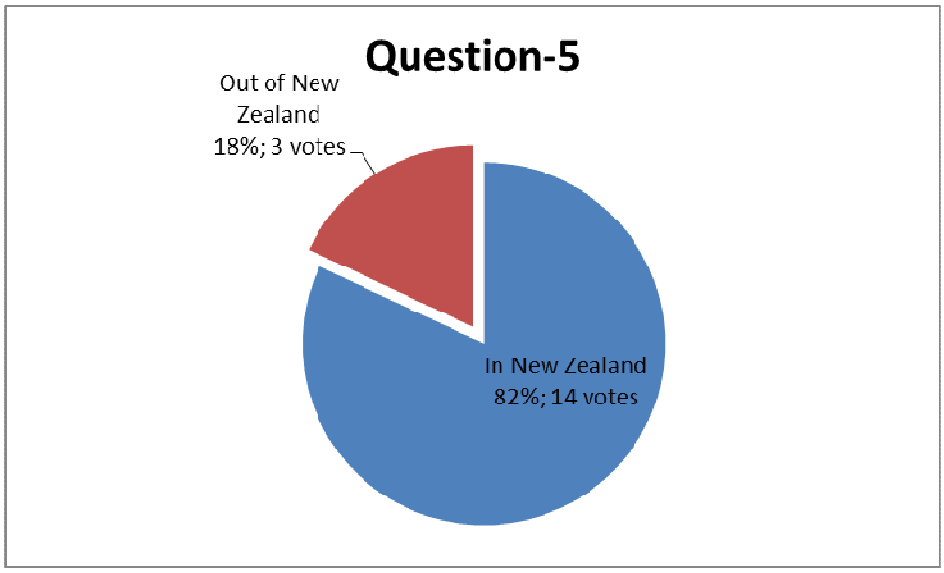


Figure 5 Immigrants', Refugees', and Others' Results of Question 5

Question 5: as shown in Figure 5, eighty-two percent of the immigrants, refugees, and others, who participated in the websurvey, lived in New Zealand. Only eighteen percent of the immigrants, refugees, and others, who participated in the websurvey, were out of New Zealand.

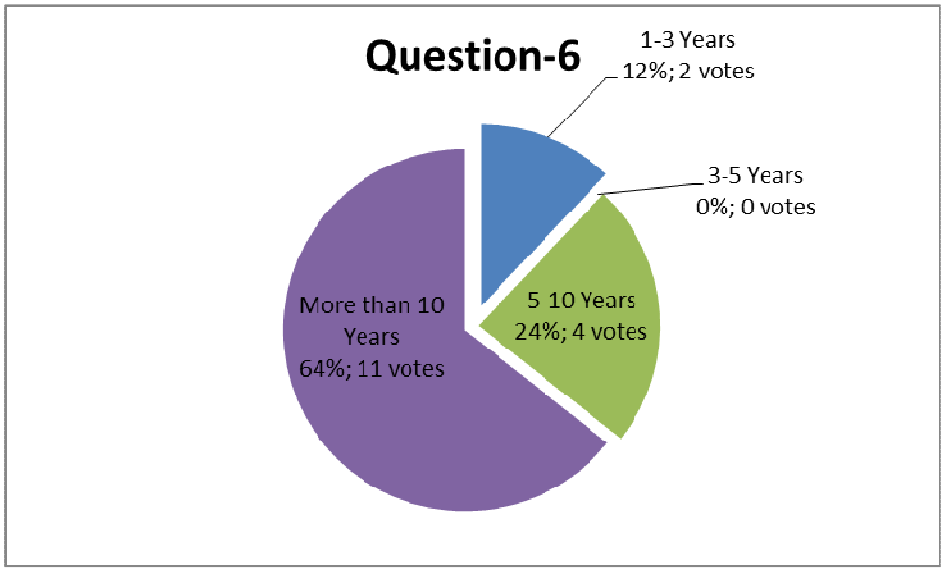


Figure 6 Immigrants', Refugees', and Others Results of Question 6

Question 6: as shown in Figure 6, sixty-four percent of the immigrants, refugees, and others, who participated in the websurvey lived in New Zealand more than ten years. Twenty-four percent of the immigrants, refugees, and others who participated in the websurvey lived in New Zealand between five to ten years. Twelve percent of the immigrants, refugees, and others, who participated in the websurvey, have lived in New Zealand between one to three years.

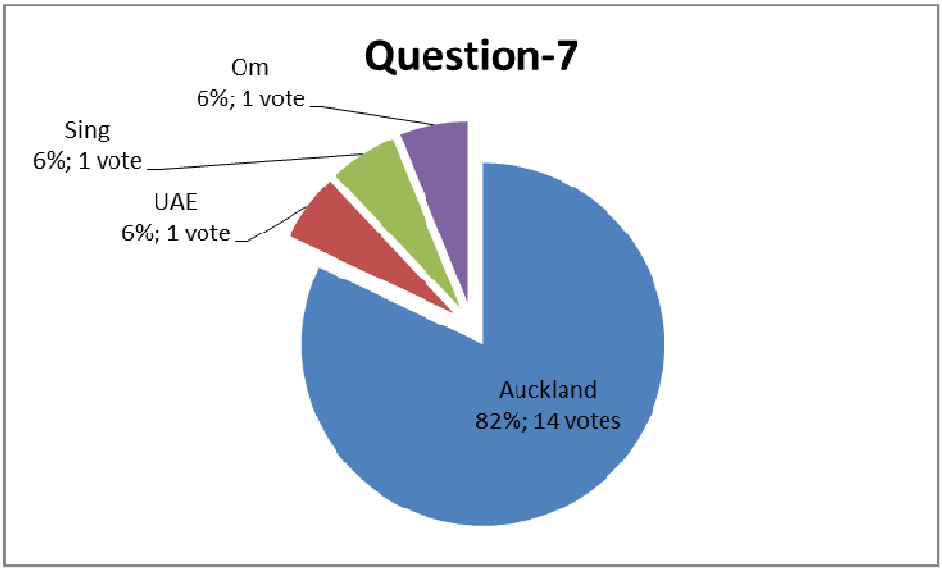


Figure 7 Immigrants', Refugees', and Others' Results of Question 7

Question 7: as shown in Figure 7, eighty-two percent of the immigrants, refugees, and others, who participated in the websurvey, were living in Auckland at the time of conducting the survey. Six percent of the immigrants, refugees, and others who participated in the websurvey were living in the UAE; it was the same percentages for participants living in Oman, and in Singapore.

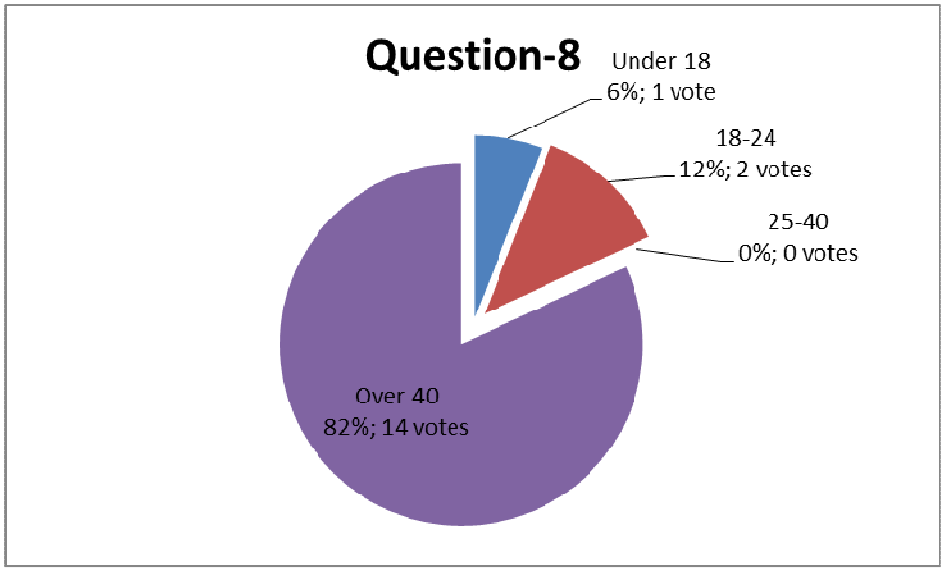


Figure 8 Immigrants', Refugees', and Others' Results of Question 8

Question 8: as shown in Figure 8, eighty-two percent of the immigrants, refugees, and others, who participated in the websurvey were over forty years old. Twelve per cent of the participants were eighteen to twenty four years old. Six percent of the immigrants, refugees, and others who participated in the websurvey were under eighteen years old.

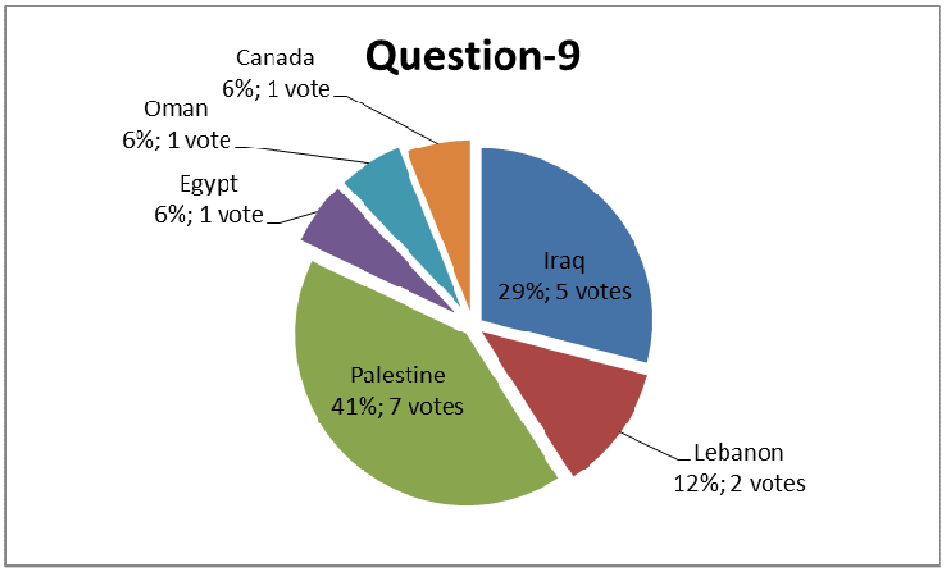


Figure 9 Immigrants', Refugees', and Others' Results of Question 9

Question 9: as shown in Figure 9, forty-one percent of the immigrants, refugees, and others, who participated in the websurvey were from Palestine. Twenty nine percent of the immigrants, refugees, and others, who participated in the websurvey were from

Iraq. Twelve percent of the immigrants, refugees, and others, who participated in the websurvey were from Lebanon. Six percent of the immigrants, refugees, and others who participated in the websurvey were from Egypt, the same percentage of participants were from Canada and Oman.

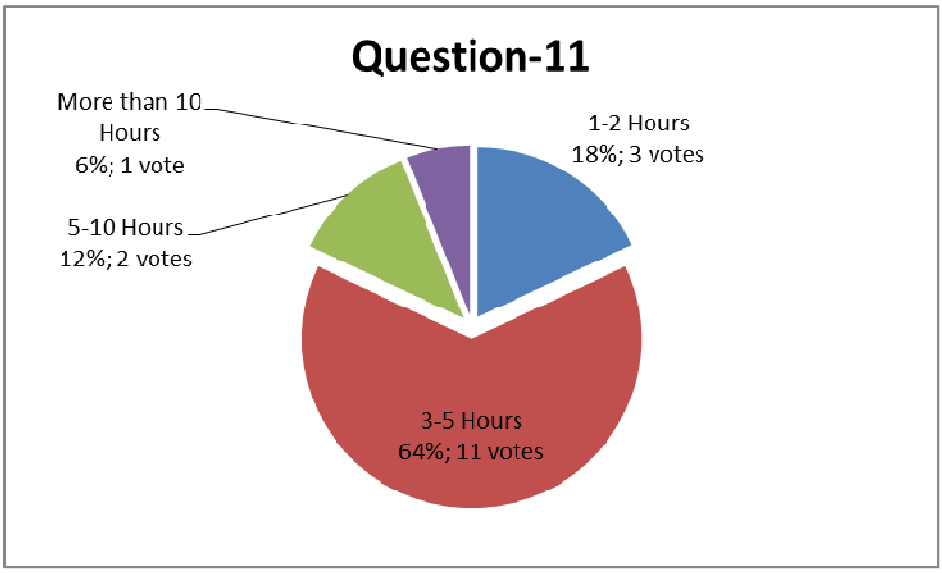


Figure 10 Immigrants', Refugees', and Others' Results of Question 11

Question 11: as shown in Figure 10, sixty-four percent of the immigrants, refugees, and others, who participated in the websurvey spent three to five hours online daily. Eighteen percent of the immigrants, refugees, and others who participated in the websurvey spent one to two hours online daily. Twelve percent of immigrants, refugees, and others who participated in the websurvey spent five to ten hours online daily. Six percent of the immigrants who participated on the websurvey spent more than ten hours online daily.

Question 12: all of immigrants, refugees, and others who participated in the websurvey had broadband at home.

Question 13: all of immigrants, refugees, and others who participated in the websurvey thought that it is important to have broadband at home.

Question 14: all of immigrants, refugees, and others, who participated in the websurvey had a PC at home.

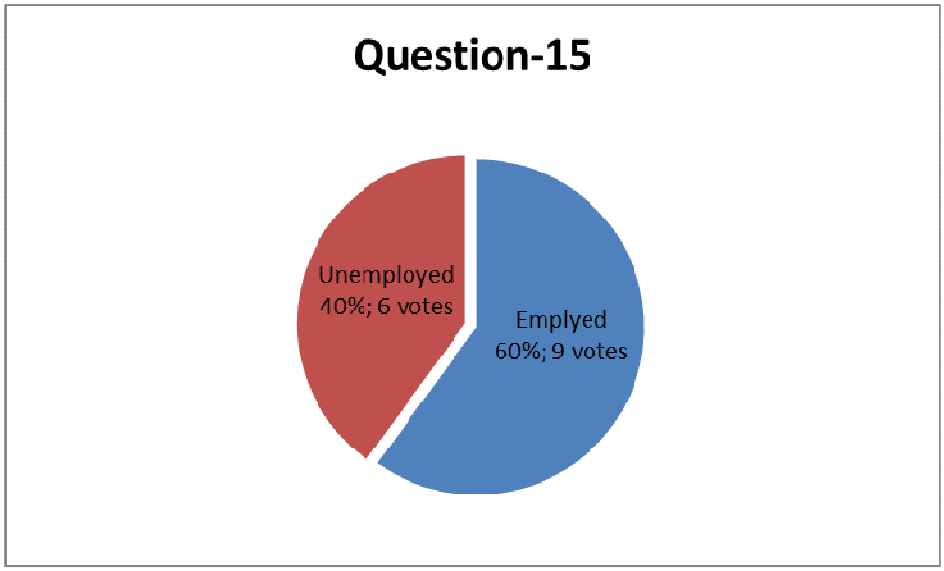


Figure 11 Immigrants', Refugees', and Others' Results of Question 15

Question 15: as shown in Figure 11, sixty percent of immigrants, refugees, and others who participated in the websurvey were employed. Forty percent of the immigrants, refugees, and others who participated in the websurvey were unemployed. The total participants who answered this question were fifteen, two decided not to answer this question.

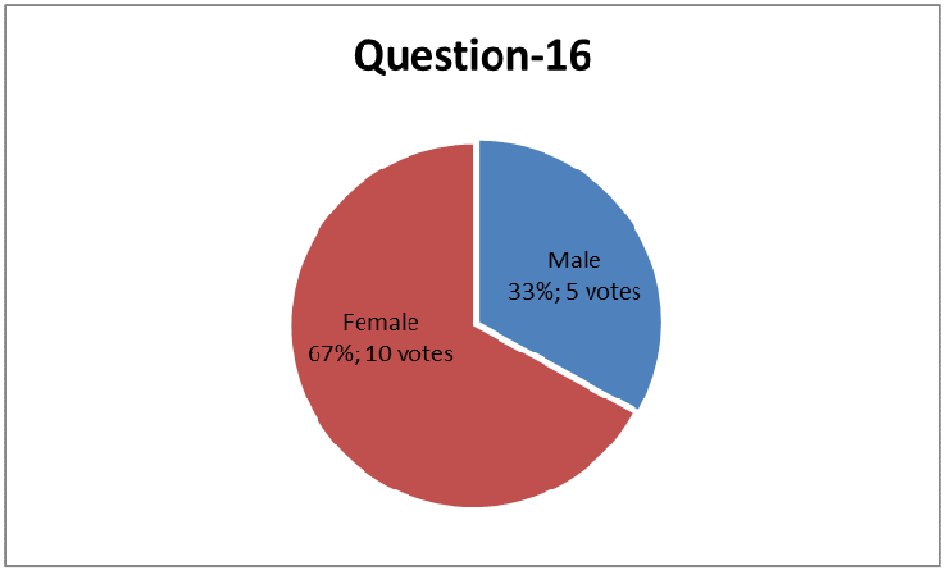


Figure 12 Immigrants', Refugees', and Others' Results of Question 16

Question 16: as shown in Figure 12, sixty-seven percent of the immigrants, refugees, and others who participated in the websurvey were females. On the other hand, only thirty-three percent of the immigrants, refugees, and others who participated in the

websurvey were males. The total participants who answered this question were fifteen participants, two decided not to answer this question.

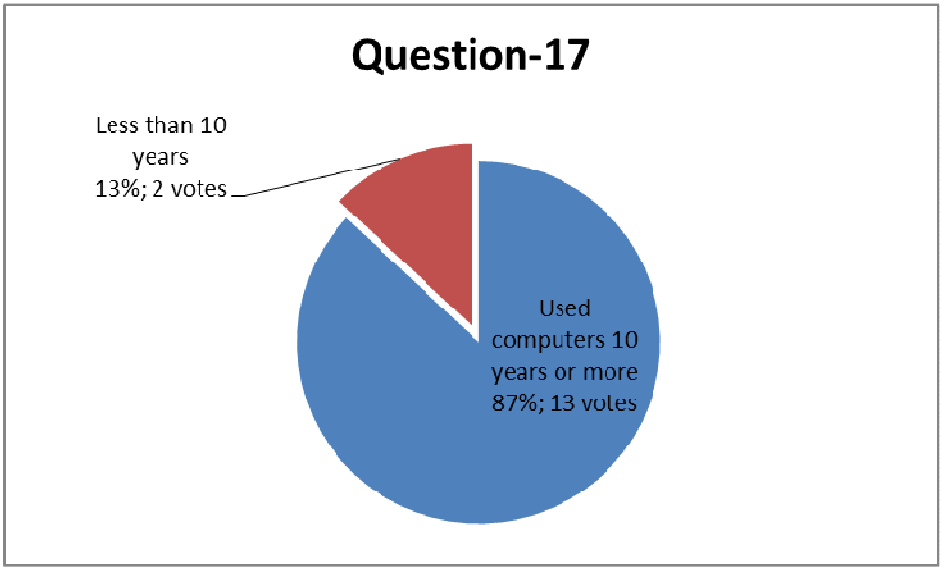


Figure 13 Immigrants', Refugees', and Others Results of Question 17

Question 17: as shown in Figure 13, eighty-seven percent of the immigrants, refugees, and others who participated in the websurvey have used computers ten years or more. Thirteen percent of the immigrants, refugees, and others who participated in the websurvey used computers for less than ten years. The total participants who answered this question were fifteen.

Question 18: twenty nine percent of the immigrants, refugees, and others who participated in the websurvey have given positive comments for the websurvey. Sixty five percent of the immigrants and refugees, who participated in the websurvey, have not commented. Six per cent of the immigrants, refugees', and others' have commented negatively in contradiction of the websurvey.

Table 2 Immigrants', Refugees', and Others' Comments

Positive Feedback	Negative Feedback
I think this survey is very good and useful for many Arabic peoples to know more information about NZ. ..... Best regard	
It is great to have such webpage. I hope it will exist within this year. Thanks,	
	It is better to do the page only in English with a link for a separate page in Arabic

All good.	
it's an easy one ..to the point questions	
لم يتم السؤال عن المستوى التعليمي، أم أنه غير مهم؟ وكذلك نوعية العمل ، هل له ارتباط بالكمبيوتر أم لا شكراً There were no questions included in the questionnaire, in regards to participants' educational background, or is it irrelevant? Also the participants' occupation, does it have to be relevant to IT, than you (Researcher's translation to comments in Arabic)	

Table 2 is a summary of some of the immigrants', refugees', and others' participants who commented on the websurvey.

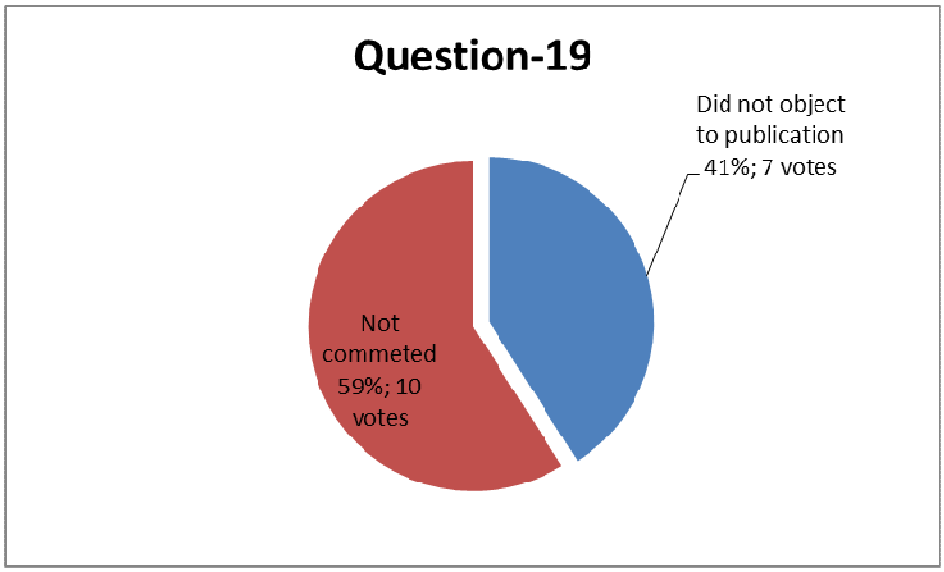


Figure 14 Immigrants' and Refugees' Results of Question 19

Question 19: as shown in Figure 14, forty-one percent of the immigrants, refugees, and others who participated in the websurvey did not object to the publication of the results of this research, whereas fifty nine percent of the immigrants, refugees, and others who participated in the websurvey have not commented.

Appendix F Implications Drawn of Women's Results

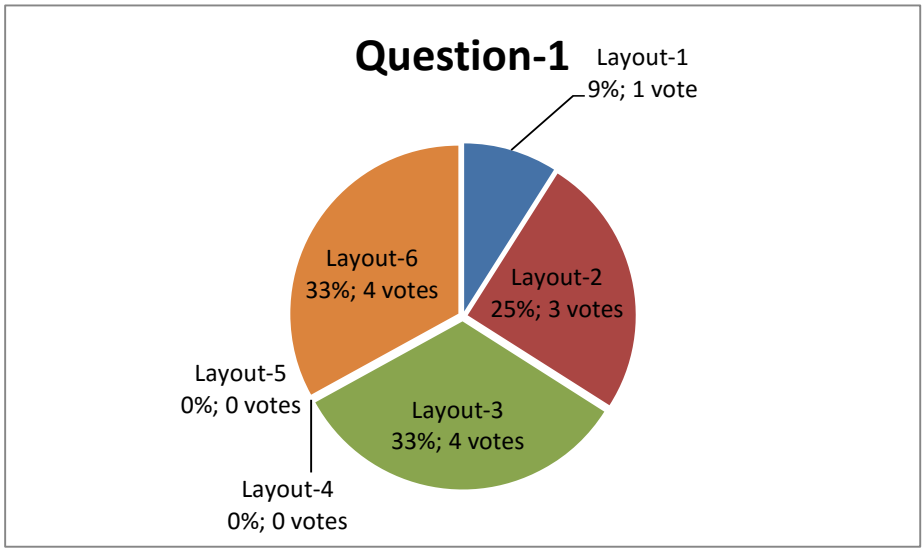


Figure 1 Women's Participants Results of Question 1

Question 1: as shown in Figure 1, nine per cent of the women's participants have chosen Layout 1. Twenty five per cent of the women's participants have selected Layout 2. Thirty three per cent of the women's participants have selected Layout 3. No one of the women's participants have selected Layout 4 nor Layout 5. Thirty three per cent of the women's participants have selected Layout 6.

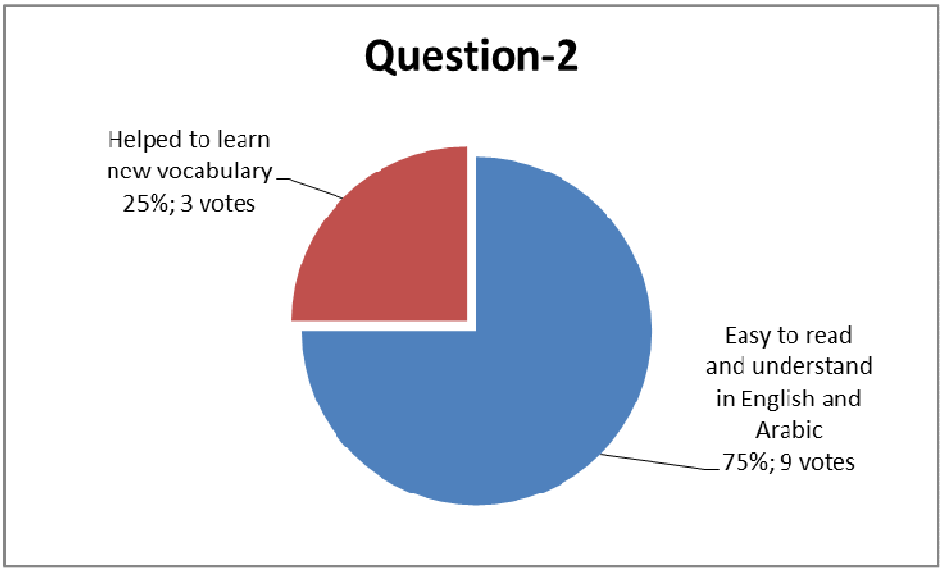


Figure 2 Women's participants Results of Question 2

Question 2: as shown in Figure 2, seventy five per cent of the women's participants thought that the paralingual layout that they have selected in question one was easy to read and understand in Arabic and English, whereas only twenty five per cent thought

that the paralingual layout that they have selected helped them to learn new vocabulary as well.

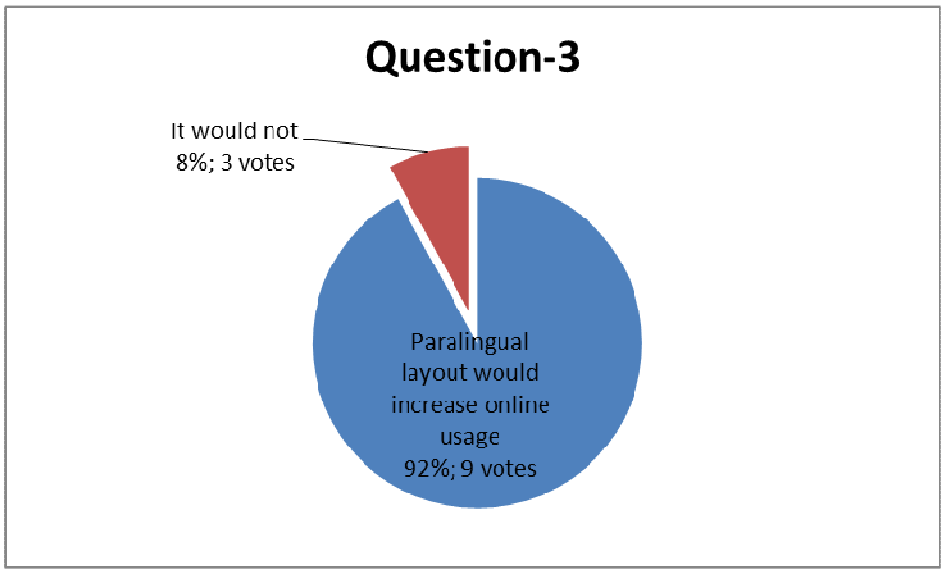


Figure 3 Women's participants Results of Question 3

Question 3: as shown in Finger-3, ninety two per cent of women's participants thought that a paralingual websites layout would increase their online usage, whereas only eight per cent thought it would not.

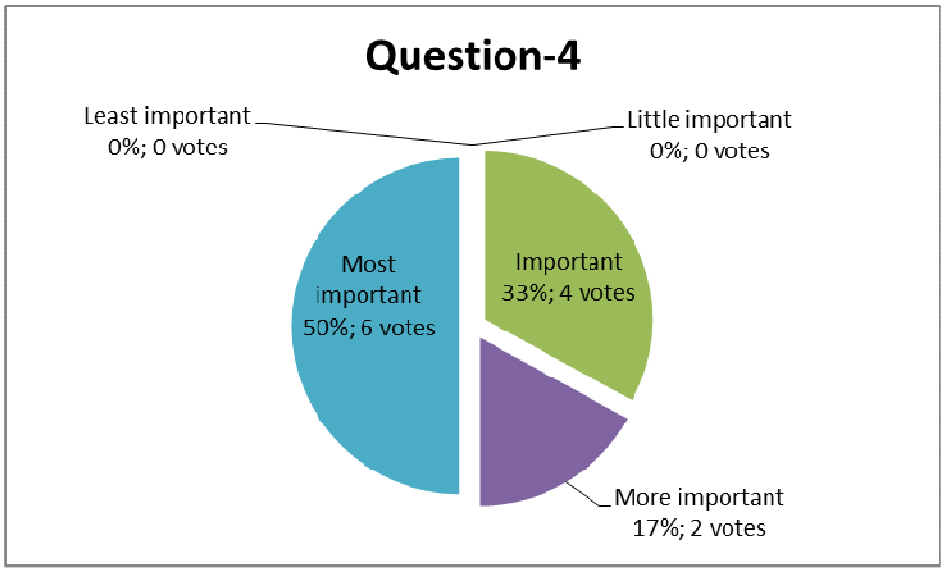


Figure 4 Women's Participants Results of Question 4

Question 4: as shown in Figure 4, fifty per cent of the women's participants thought that using paralingual websites were most important to get information. Thirty three per cent of the women's participants thought paralingual websites were important.

Seventeen per cent of the women's participants thought paralingual websites were more important.

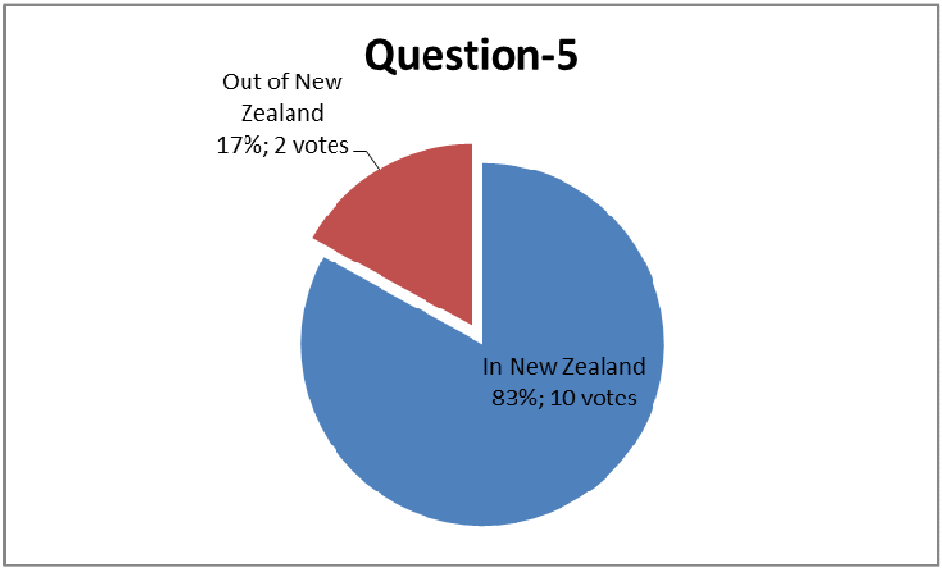


Figure 5 Women's Participants Results of Question 5

Question 5: as shown in Figure 5, eighty three per cent of the women's participants were living in New Zealand, whereas seventeen per cent of the women's participants were living out of New Zealand.

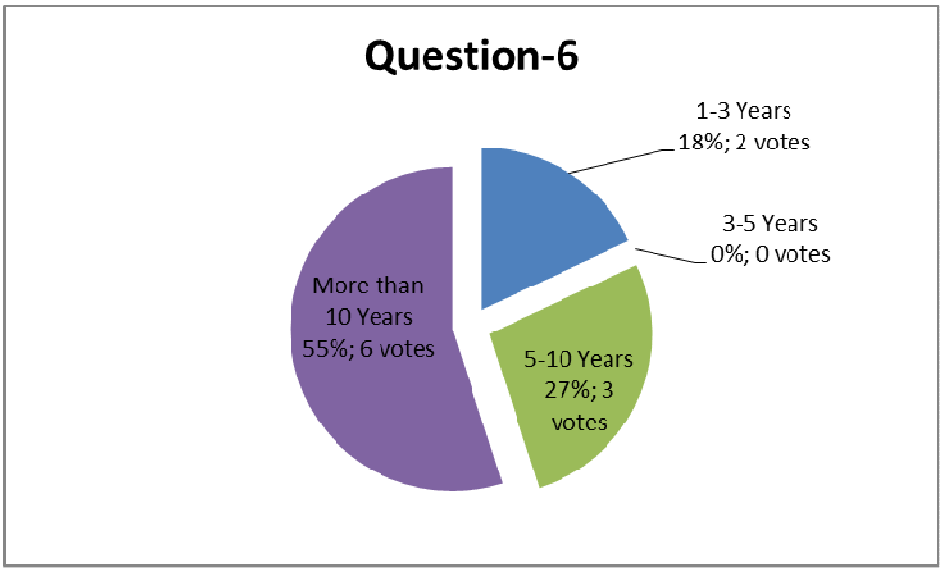


Figure 6 Women's Participants Results of Question 6

Question 6: as shown in Figure 6, fifty five per cent of the women's participants were living in New Zealand more than ten years. Twenty seven per cent of the women's participants were living in New Zealand for five to ten years. Eighteen per

cent of the women's participants were living in New Zealand. Eighteen per cent of the women's participants were living in New Zealand one to three years. No one of the women's participants were living in New Zealand three to five years. The total participants for this question were eleven.

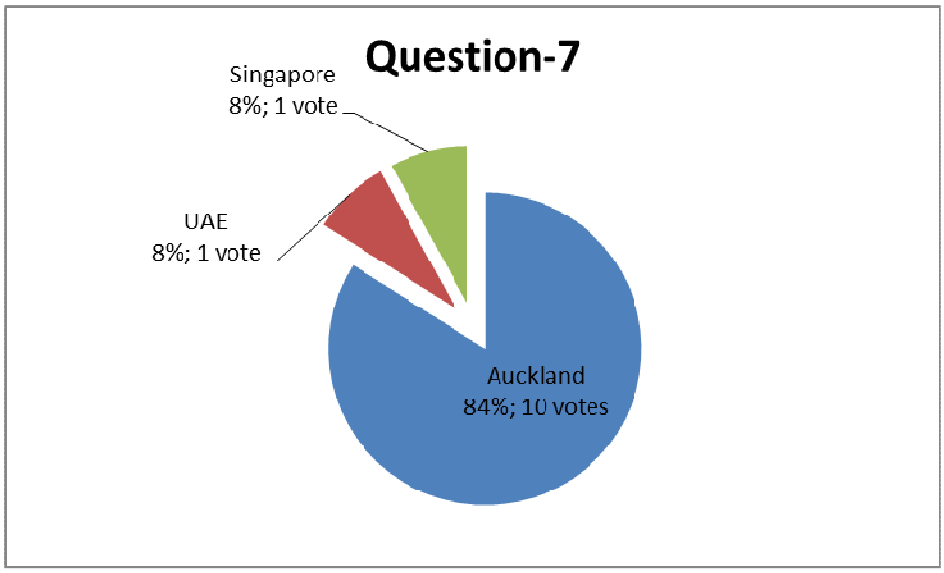


Figure 7 Women's Participants Results of Question 7

Question 7: as shown in Figure 7, eighty four per cent of the women's participants were living in Auckland; eight per cent were living in the United Arab Emirates (UAE); and one per cent were living in Singapore.

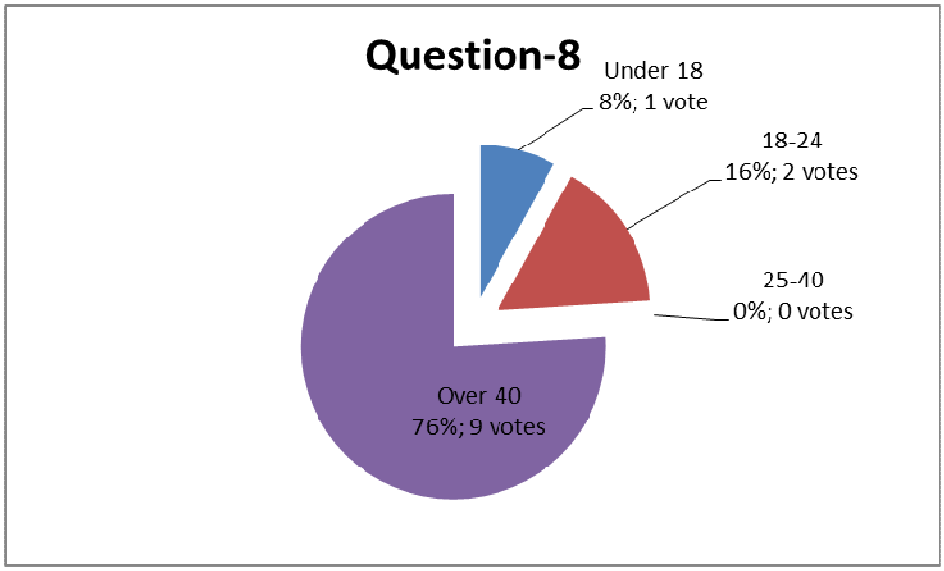


Figure 8 Women's Participants Results of Question 8

Question 8: as shown in Figure 8, seventy six per cent of the women's participants were over forty years old; sixteen per cent were between eighteen to twenty four years old; eight per cent were under eighteen years old; and no one of the women's participants were between twenty five to forty years.

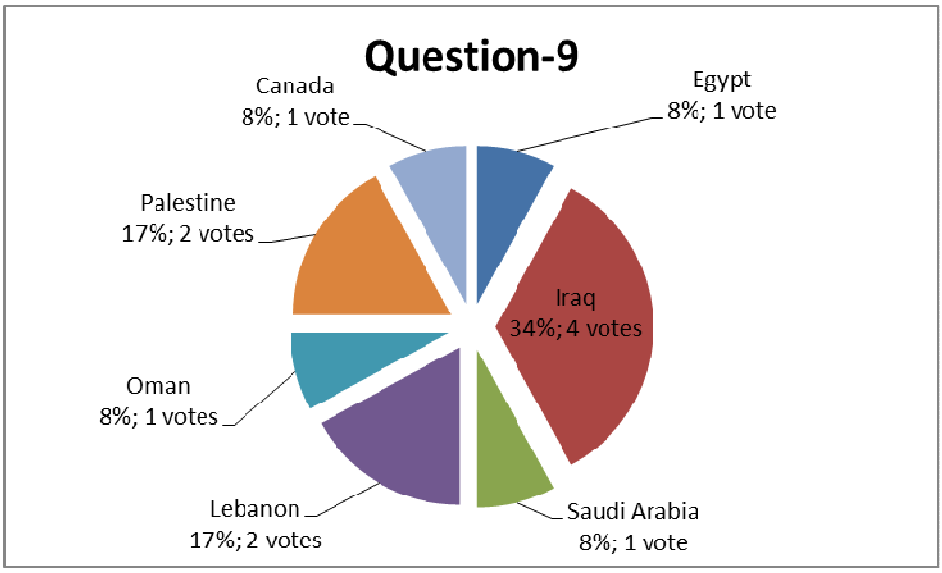


Figure 9 Women's Participants Results of Question 9

Question 9: as shown in Figure 9, thirty four per cent of the women's participants were from Iraq; seventeen per cent were from Lebanon; seventeen per cent were from Palestine; eight per cent were from Egypt; eight per cent were from Canada; eight per cent were from The Kingdom of Saudi Arabia; and eight per cent from Oman.

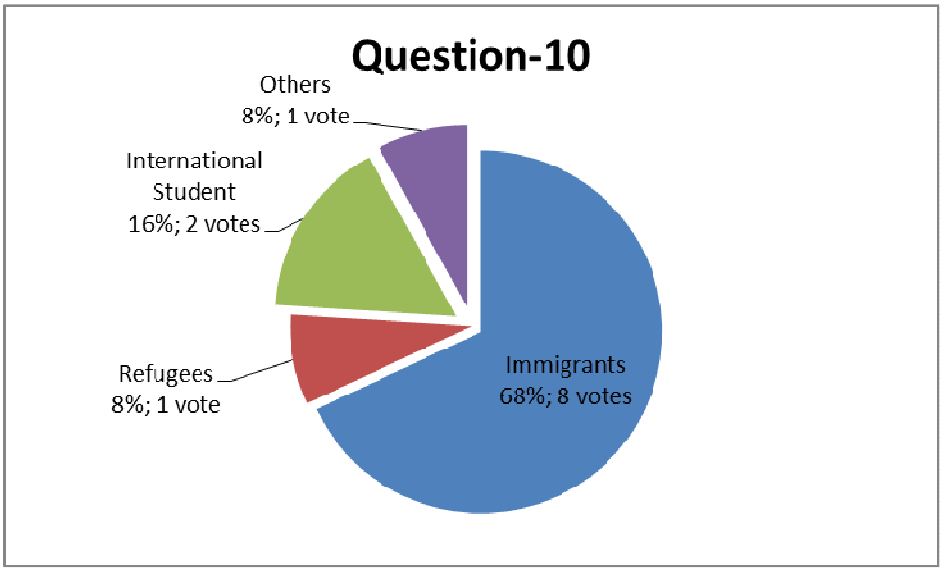


Figure 10 Women's Participants Results of Question 10

Question 10: as shown in Figure 10, sixty eight per cent of the women's participants were immigrants; sixteen per cent were international students; eight per cent were refugees; and eight per cent were participants classified as others.

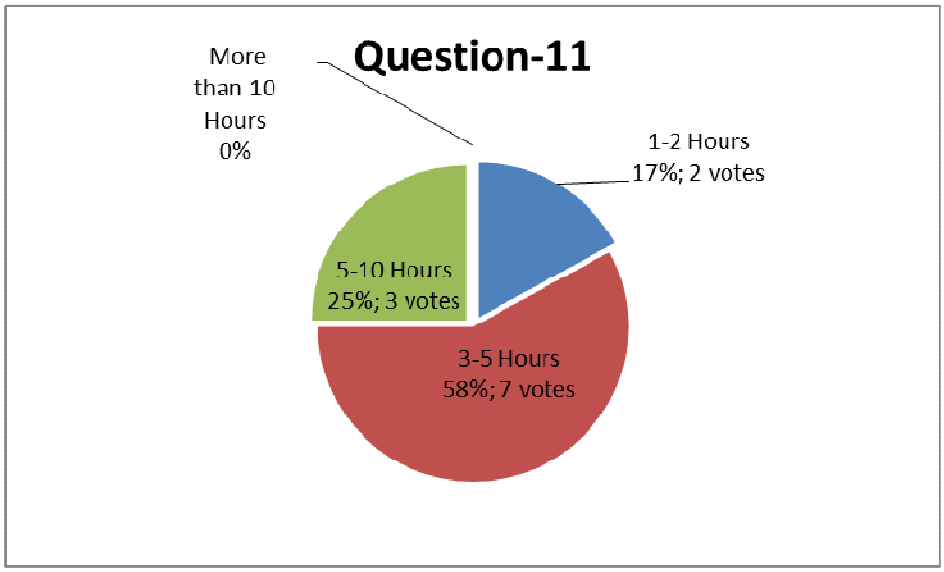


Figure 11 Women's Participants Results of Question 11

Question 11: as shown in Figure 11, fifty eight per cent of the women's participants spend three to five hours online daily; twenty five per cent spend five to ten hours online daily; seventeen per cent spend one to two hours online daily; and no one of the women's participants spend more than ten hours online daily.

Question 12: all of the women's participants had broadband connection at home.

Question 13: all of the women's participants thought that it is important to have Internet connection at home.

Question 14: all of the women's participants had a PC at home.

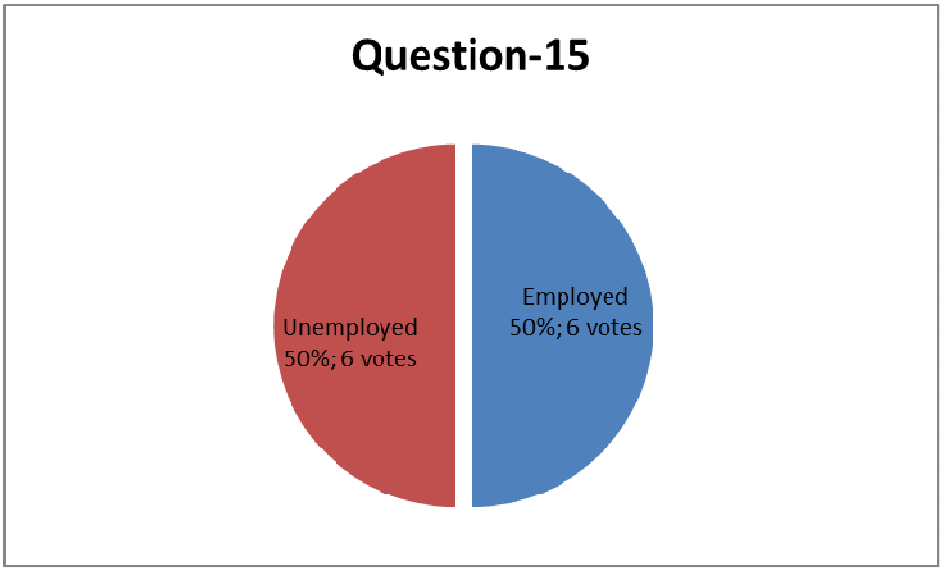


Figure 12 Women's Participants Results of Question 15

Question 15: as shown in Figure 12, fifty per cent of the women's participants were unemployed; and the other fifty per cent of the women's participants were employed.

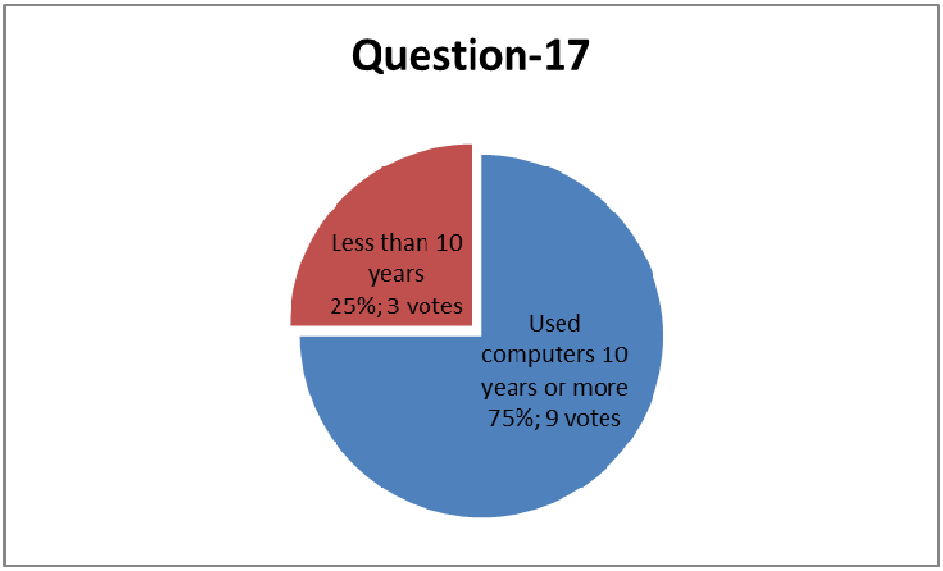


Figure 13 Women's Participants Results of Question 17

Question 17: as shown in Figure 13, seventy five per cent of the women's participants have used a computer ten years or more; whereas only twenty five per cent of the women's participants have used a computer less than ten years.

Question 18: forty two per cent of the women's participants commented positively for the websurvey; fifty per cent did not comment at all; and only eight per cent have commented negatively in contradiction of the websurvey.

The following table lists some of the comments of the women's participants for the websurvey:

Table 1 Women's Participants Comments of Question 18

Positive Feedback	Negative Feedback
I think this survey is very good and useful for many Arabic peoples to know more information about NZ. ..... Best regard	
Thank you for this survey..	
	It is better to do the page only in English with a link for a separate page in Arabic
The survey is honest and reliable.	
it's an easy one ..to the point questions	
لم يتم السؤال عن المستوى التعليمي، أم أنه غير مهم؟ وكذلك نوعية العمل ، هل له ارتباط بالكمبيوتر أم لا شكراً There were no questions included in the questionnaire, in regards to participants' educational background, or is it irrelevant? Also the participants' occupation, does it have to be relevant to IT, than you (Researcher's translation to comments in Arabic)	

Appendix G Implications Drawn of Men's Results

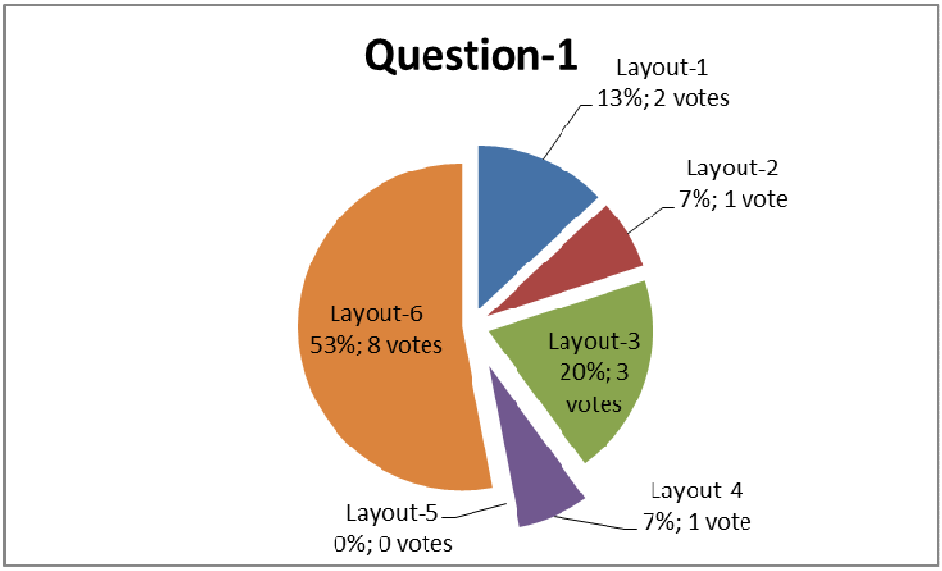


Figure 1 Men's Participants Results of Question 1

Question 1: as shown in Figure 1, fifty three per cent of the men's participants selected layout six; twenty per cent of the men's participants selected layout three, thirteen per cent selected layout one; seven per cent selected layout four; seven per cent selected layout two; and no one has selected layout five.

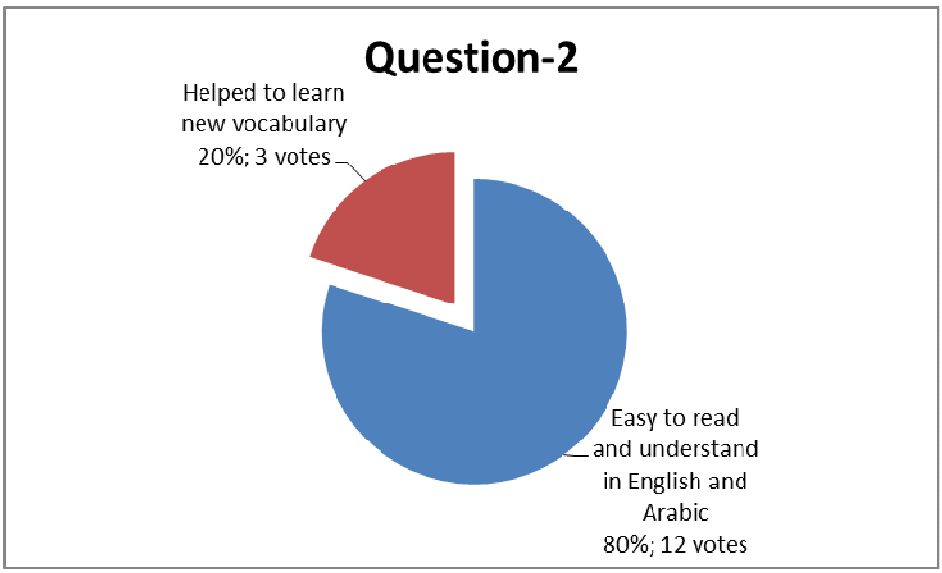


Figure 2 Men's Participants Results of Question 2

Question 2: as shown in Figure 2, eighty per cent of the men's participants thought that the paralingual layout that they have selected in question one was easy to read and understand in English and Arabic; whereas twenty per cent of the men's

participants thought that the paralingual layout selection that have made in question one helped them to learn new vocabulary as well as it was easy to read.

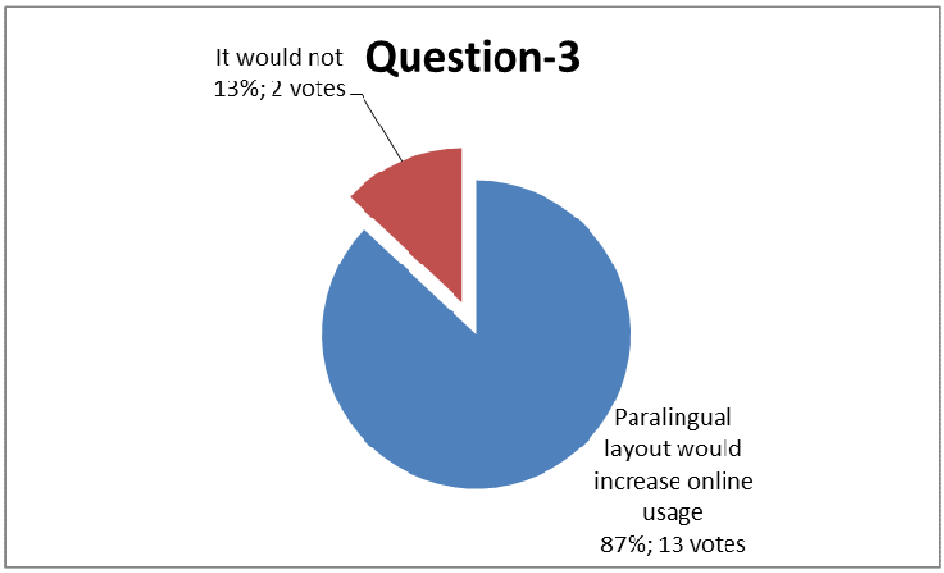


Figure 3 Men's Participants Results of Question 3

Question 3: as shown in Figure 3, eighty seven per cent of the men's participants thought that paralingual websites would increase online usage; whereas thirteen per cent thought otherwise.

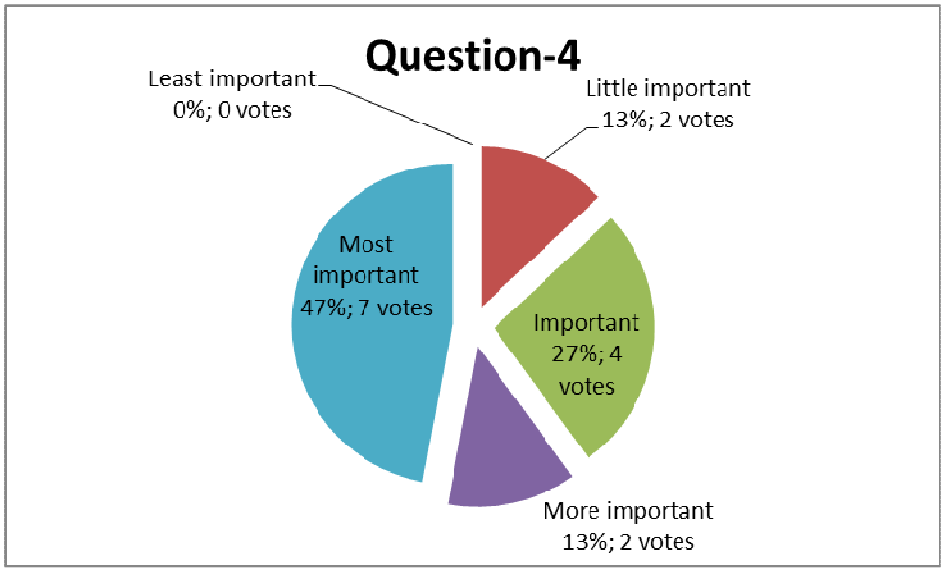


Figure 4 Men's Participants Results of Question 4

Question 4: as shown in Figure 4, forty seven per cent of the men's participants categorised paralingual layouts as most important; twenty seven per cent of the men's participants categorised paralingual layouts as important; thirteen per cent of the

men's participants categorised paralingual layouts as more important; thirteen per cent categorised paralingual layouts as little important; and no one has graded paralingual layouts as least important.

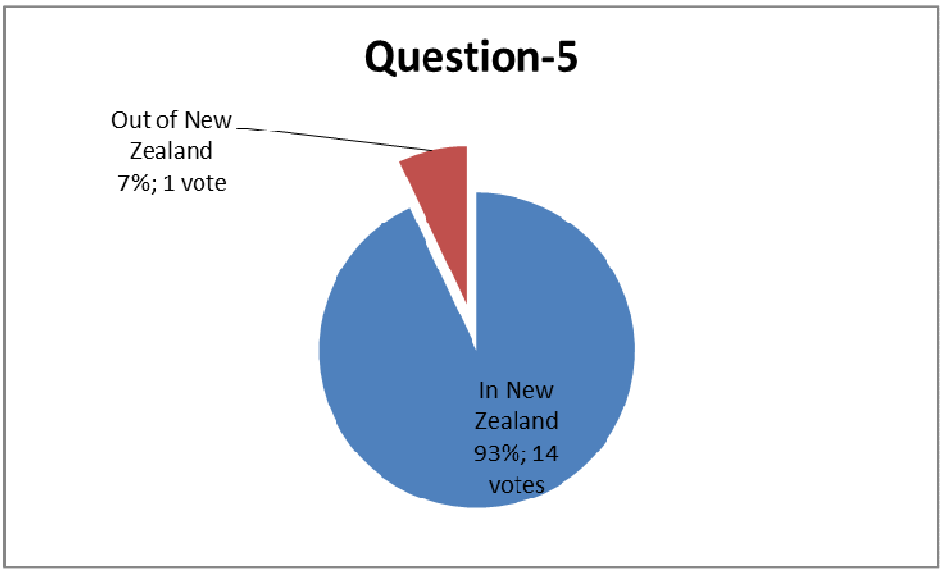


Figure 5 Men's Participants Results of Question 5

Question 5: as shown in Figure 5, ninety three per cent of the men's participants were living in New Zealand; whereas only seven per cent of the men's participants were living out of New Zealand.

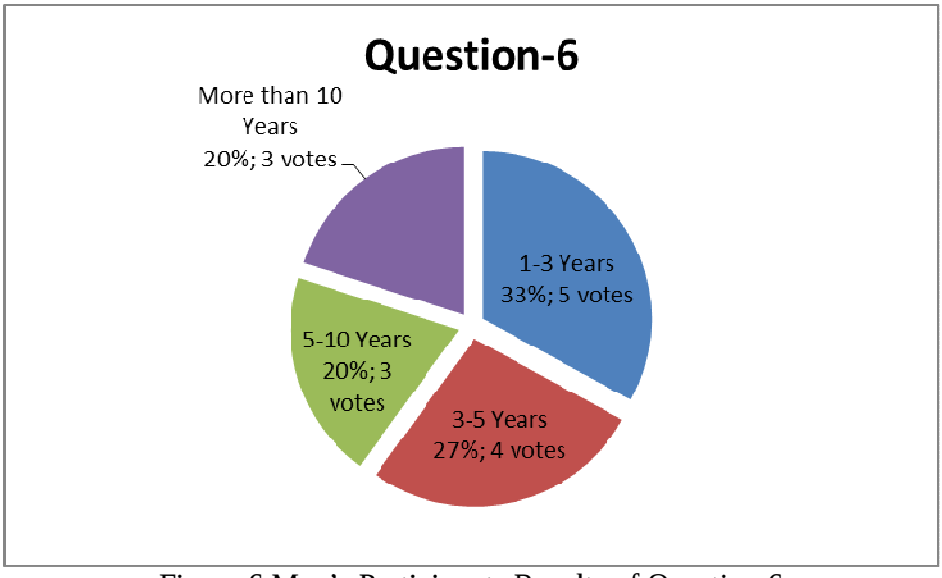


Figure 6 Men's Participants Results of Question 6

Question 6: as shown in Figure 6, thirty three per cent of the men's participants lived in New Zealand one to three years; twenty seven per cent of the men's participants

lived in New Zealand between three to five years; and twenty per cent of the men's participants lived in New Zealand between five to ten years.

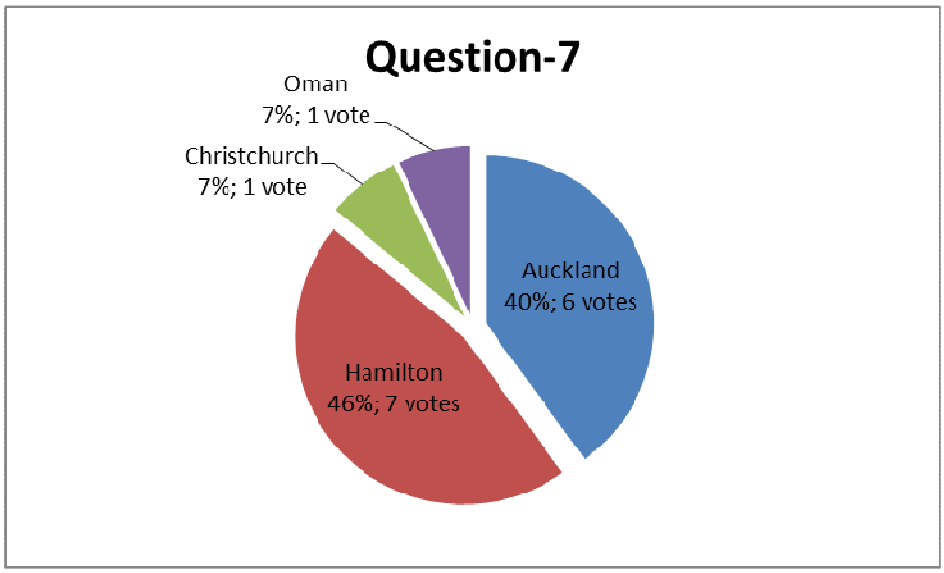


Figure 7 Men's Participants Results of Question 7

Question 7: as shown in Figure 7, forty six per cent of the men's participants were living in Hamilton; forty per cent of the men's participants were living in Auckland; seven per cent of the men's participants were living in Oman; and seven per cent of the men's participants were living in Christchurch.

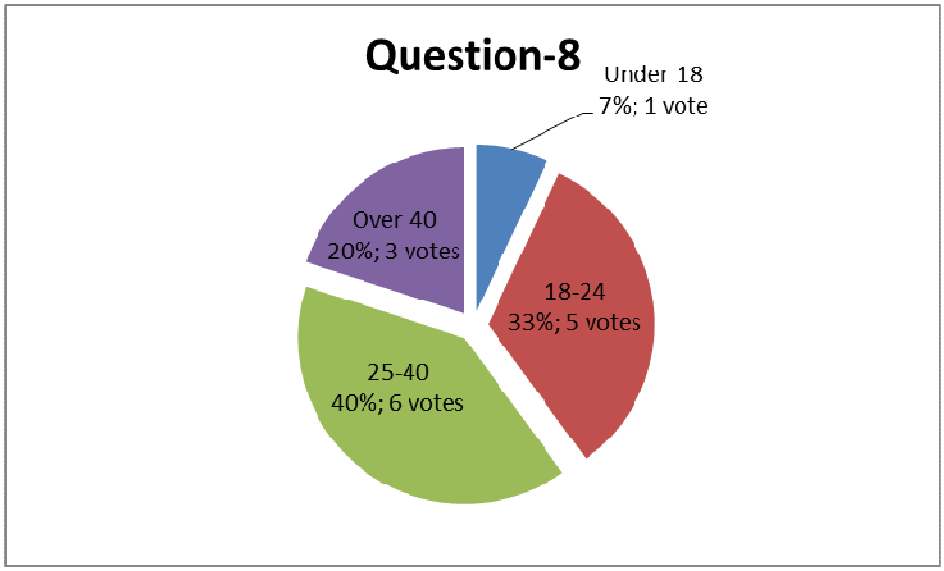


Figure 8 Men's Participants Results of Question 8

Question 8: as shown in Figure 8, forty per cent of the men's participants were between twenty five to forty years old; thirty three per cent of the men's participants

were between eighteen to twenty four years old; twenty per cent of the men's participants were over forty; and only seven per cent were under eighteen years old.

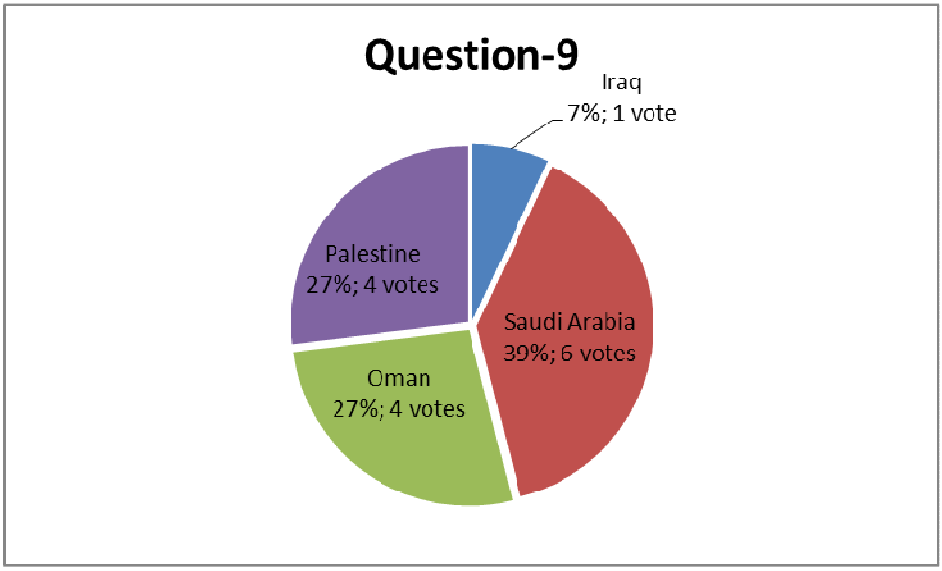


Figure 9 Men's Participants Results of Question 9

Question 9: as shown in Figure 9, thirty nine per cent of the men's participants were from the Kingdom of Saudi Arabia; twenty seven per cent were from Oman; twenty seven per cent were from Palestine; and only seven per cent were from Iraq.

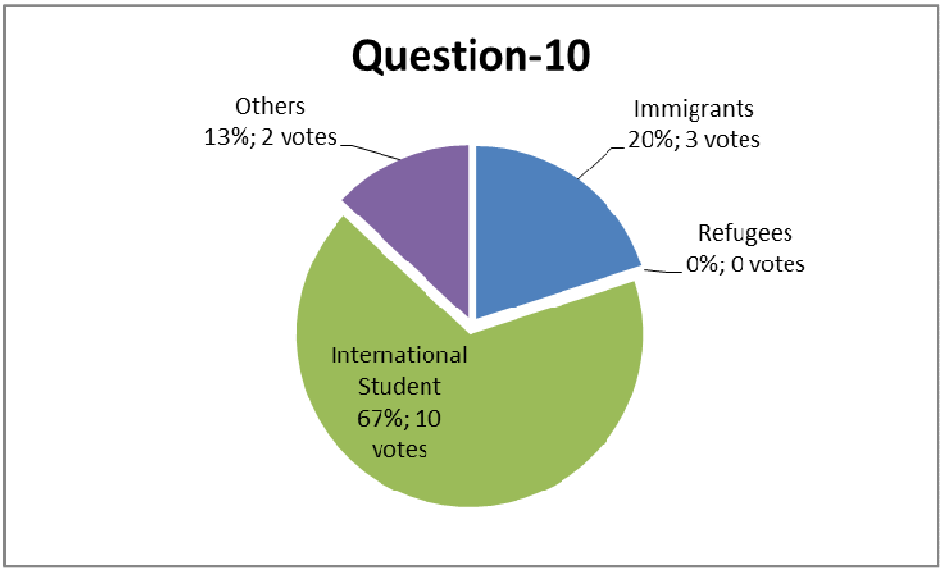


Figure 10 Men's Participants Results of Question 10

Question 10: as shown in Figure 10, sixty seven per cent of the men's participants were international students; twenty per cent were immigrants; thirteen were migrants classified as others; and none of the men's participants were refugees.

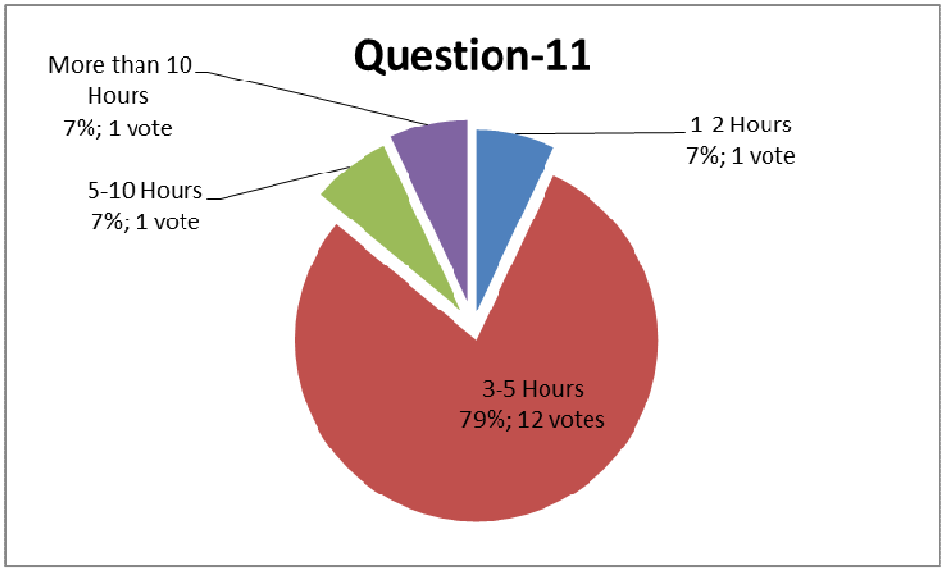


Figure 11 Men's Participants Results of Question 11

Question 11: as shown in Figure 11, seventy nine per cent of the men's participants spend three to five hours online daily; and seven per cent for each of the participants who spend five to ten hours, one to two hours, and more than ten hours daily online.

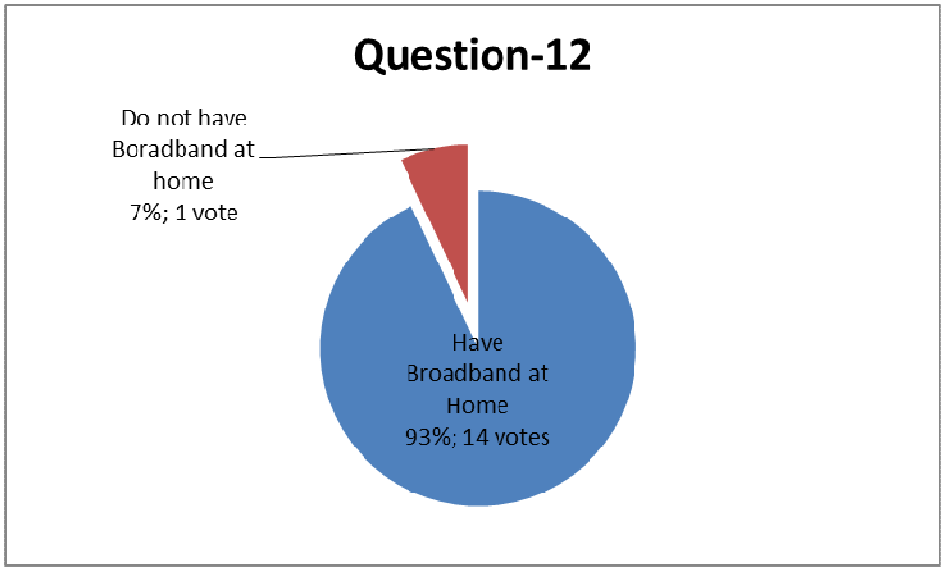


Figure 12 Men's Participants Results of Question 12

Question 12: as shown in Figure 12, ninety three per cent of the men's participants had broadband at home; whereas only seven per cent did not have broadband at home.

Question 13: all of the men's participants believe that it is important to have Internet connection at home.

Question 14: all of the men's participants have a PC at home.

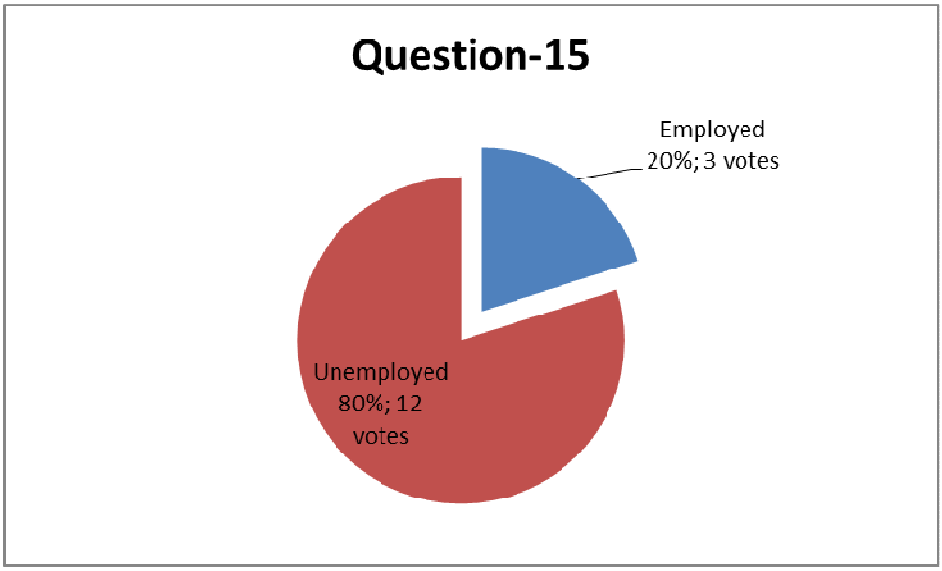


Figure 13 Men's Participants Results of Question 15

Question 15: as shown in Figure 13, eighty per cent of the men's participants were unemployed; whereas only twenty per cent of the men's participants were employed.

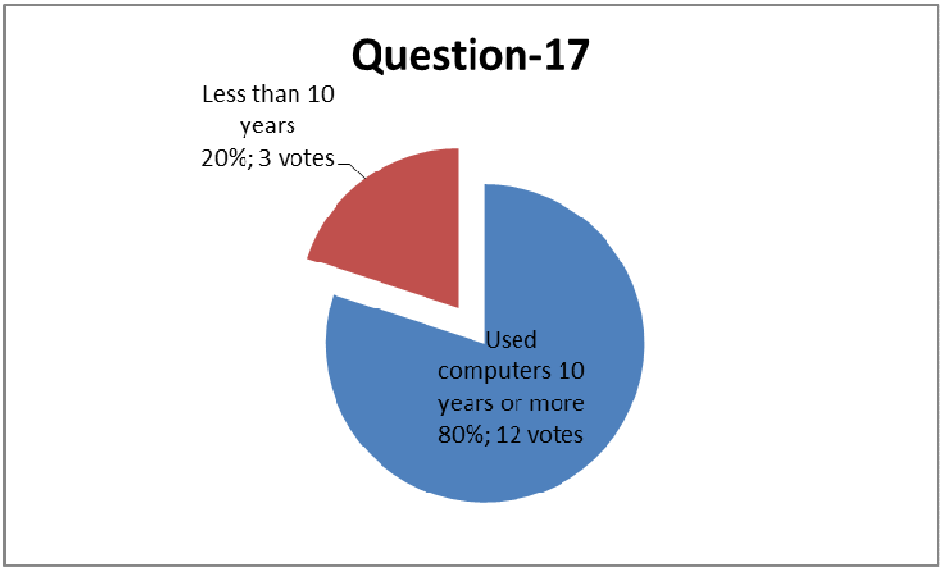


Figure 14 Men's Participants Results of Question 17

Question 17: as shown in Figure 14, eighty per cent of the men's participants used computers for ten years or more; whereas twenty per cent of the men's participants used computers for less than ten years.

Table 1 Men's Participants Comments

Positive Feedback	Negative Feedback
It is great to have such webpage. I hope it	

will exist within this year. Thanks,	
تمني لك التوفيق والنجاحif the website contain more information especially the important one like the immigration and how to connect in emergency and the law of the country I wish you success, and prosperity (Researcher's translation to comments in Arabic)	
	as i'm a computer science student, i found that none of the provided layouts would be really good for this kind of website i'm really happy to participate in your survey and i wish you all the best kind regards
All good.	
اتمني لك التفيق وتحقيق النتاج الطيبه I wish you success and obtain good results (Researcher's translation to Arabic comments)	
good lauck with this survey, may Gad will help you.	
It a good idea for displays English text with it is translation in Arabic in e-government websites.So people will try to look for further information.	
No thanks	

Question 18: forty seven per cent of the men's participants responded with good comments; seven per cent responded with negative comments; and forty six did not make any comments. Table 1 has a list of the comments made by some of the men's participants.

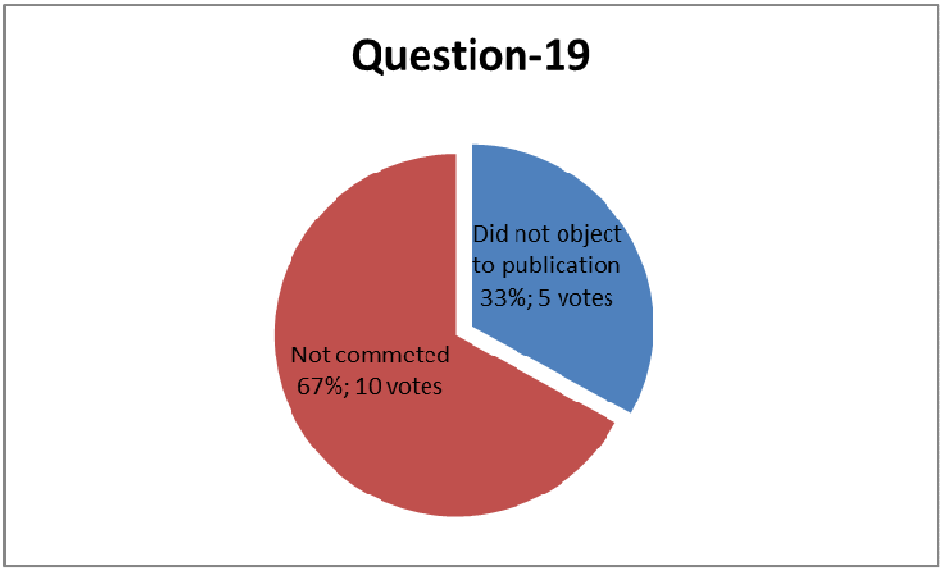


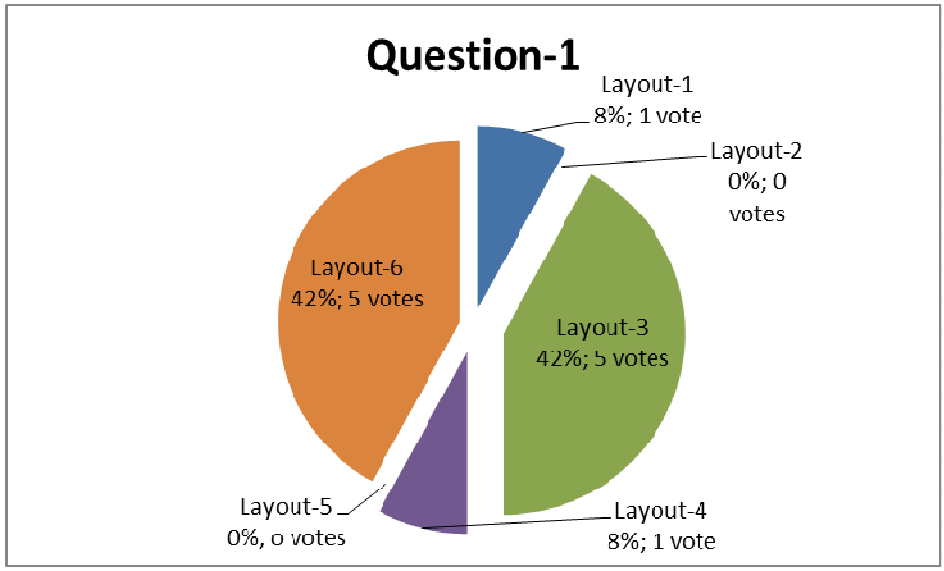
Figure 15 Men's Participants Results of Question 19

Question 19: as shown in Figure 15, sixty seven per cent of the men's participants did not object to publishing the results of this research; whereas 67 per cent did not make any

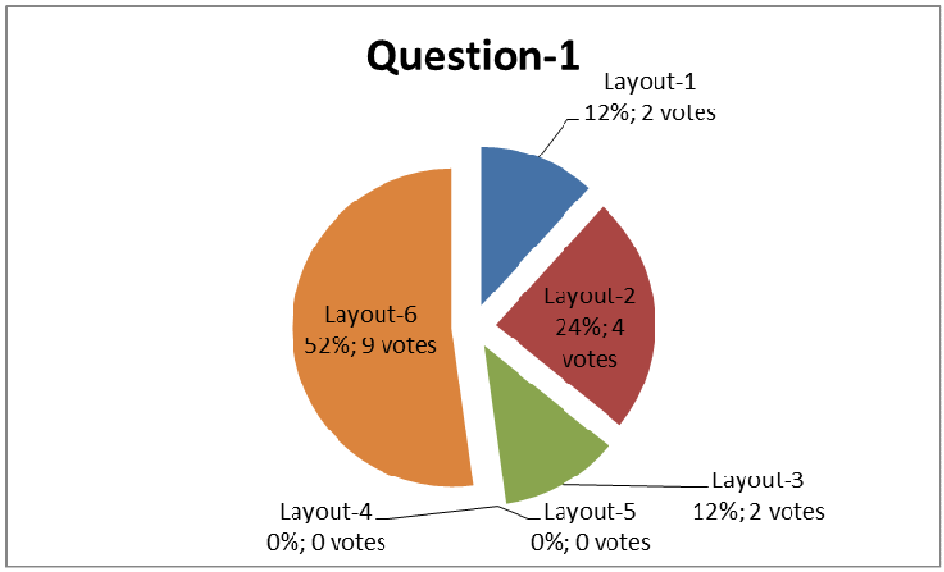
Appendix H The Comparisons Between International Students and Immigrants, Refugees, and Others from Section 4.8.1 and Section 4.8.2

Appendix H The Comparisons Between International Students and Immigrants, Refugees, and Others from Section 4.8.1 and Section 4.8.2

1. The paralingual webpage layout participants' preference, as it was acknowledged in question one.



International Students



Immigrants, Refugees, and Others

Figure 1 A Comparison between Section 4.8.1 and Section 4.8.2 of Question 1

As shown in Figure 1, there are variations in the paralingual webpage layouts preference between the international students and the immigrants, refugees, and others.

2. Ranking or rating the paralingual webpage layouts, as it was acknowledged in question four.

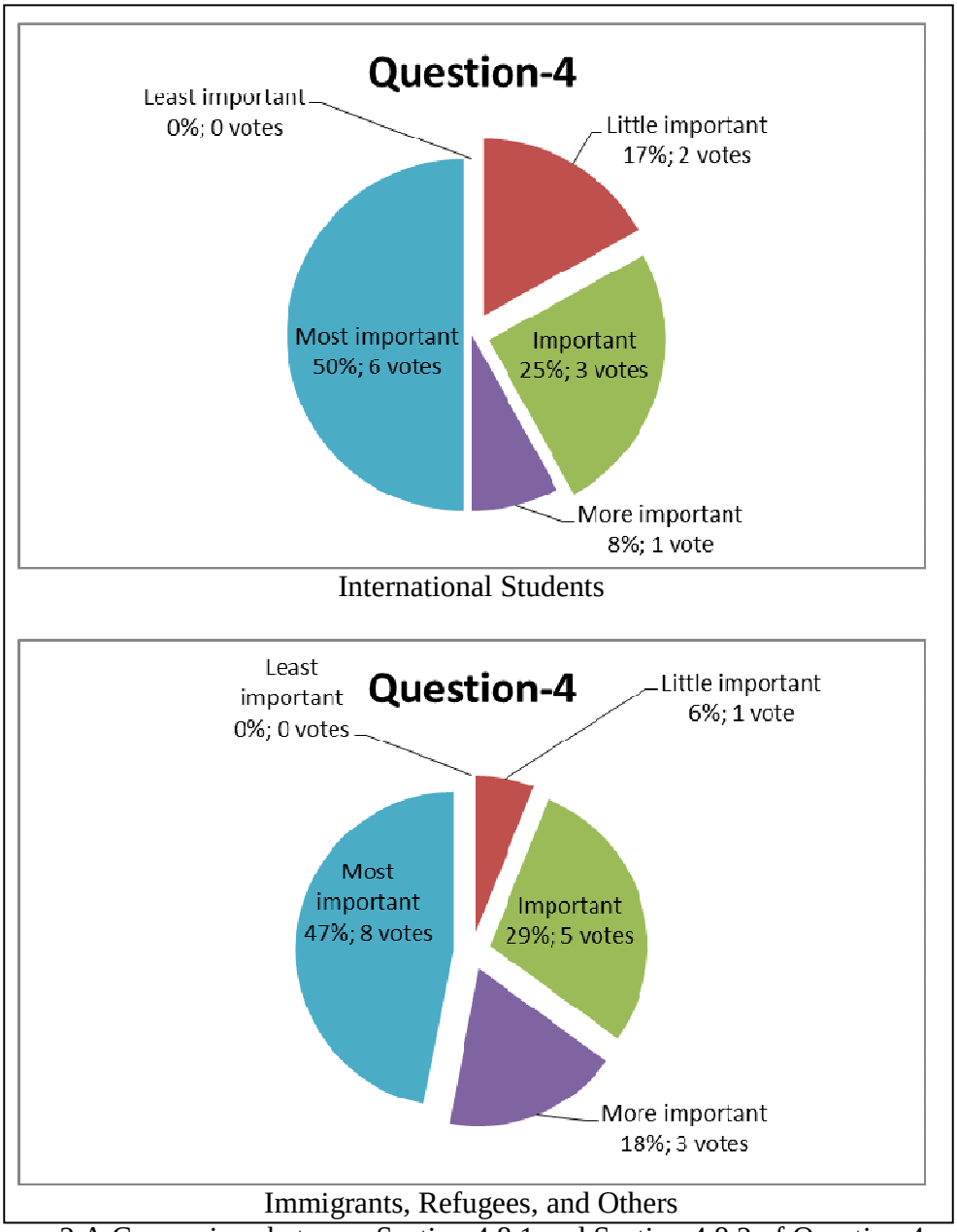
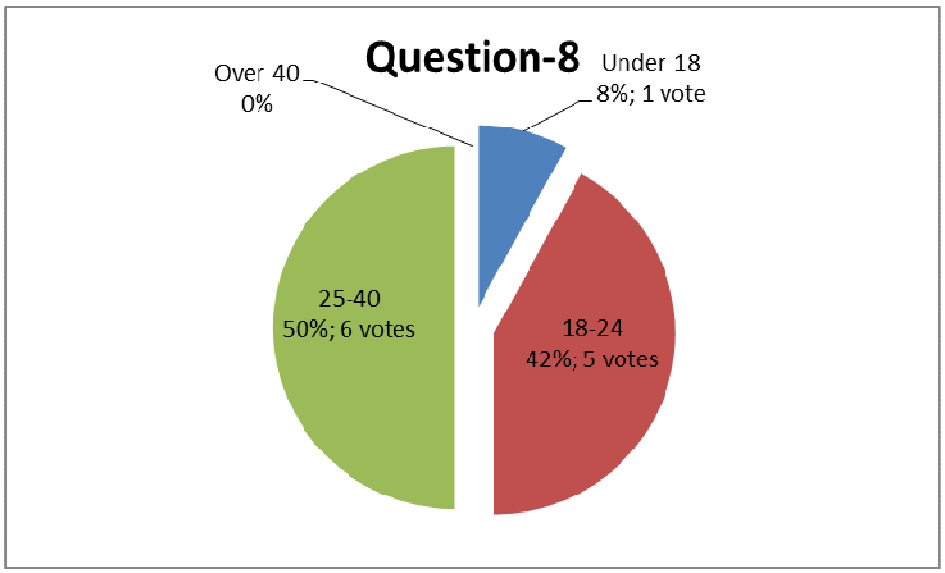


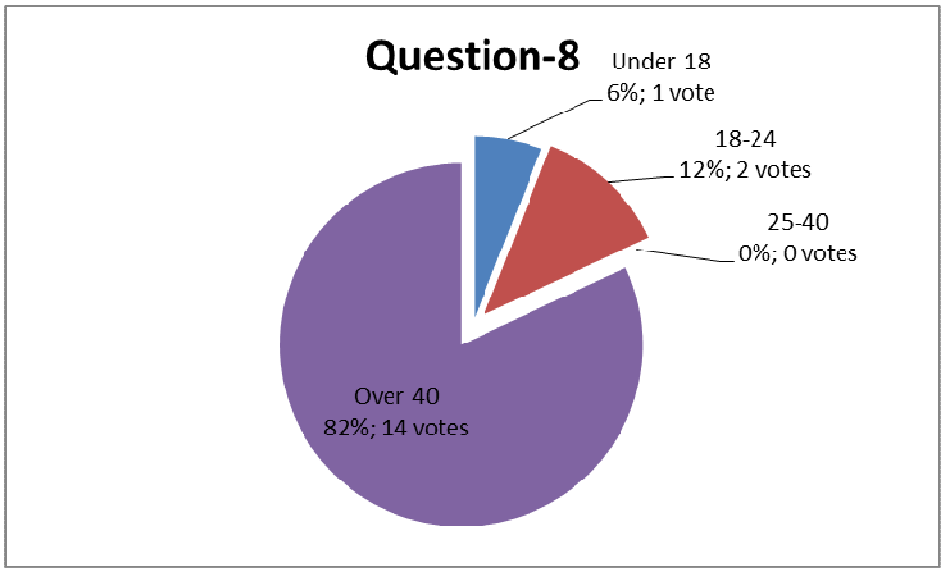
Figure 2 A Comparison between Section 4.8.1 and Section 4.8.2 of Question 4

As shown in Figure 2, the rating of the paralingual webpage layouts was very close in both groups.

3. This relationship shows the participants' age between international students and immigrants, refugees, and others, as acknowledged in question eight.



International Students

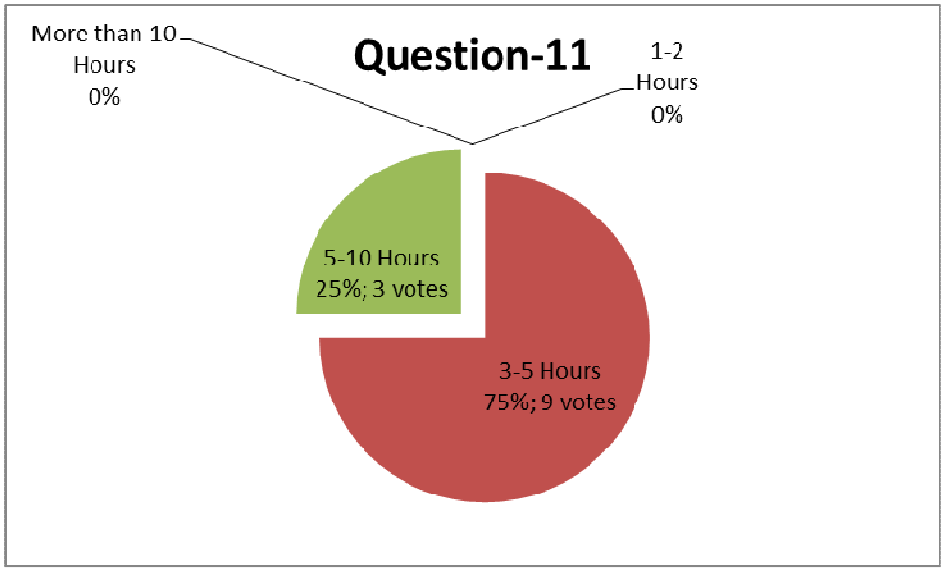


Immigrants, Refugees, and Others

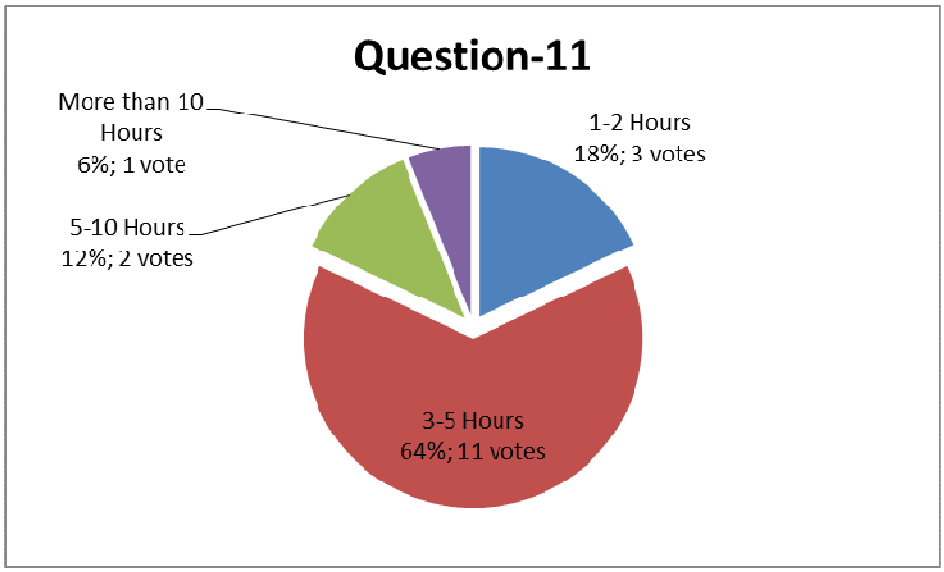
Figure 3 A Comparison between Section 4.8.1 and Section 4.8.2 of Question 8

As shown in Figure 3, there are a vast difference between international students' participants' age and the immigrants, refugees, and others' age.

4. Time spent online daily among international students compared to immigrants, refugees, and others, as acknowledged in question eleven.



International Students



Immigrants, Refugees, and Others

Figure 4 A Comparison between Section 4.81 and Section 4.8.2

As shown in Figure 4, the time spent online daily among international students and immigrants, refugees, and others were not quite similar.

5. Gender comparison between international students and immigrants, refugees, and others, as it was acknowledged in question sixteen.

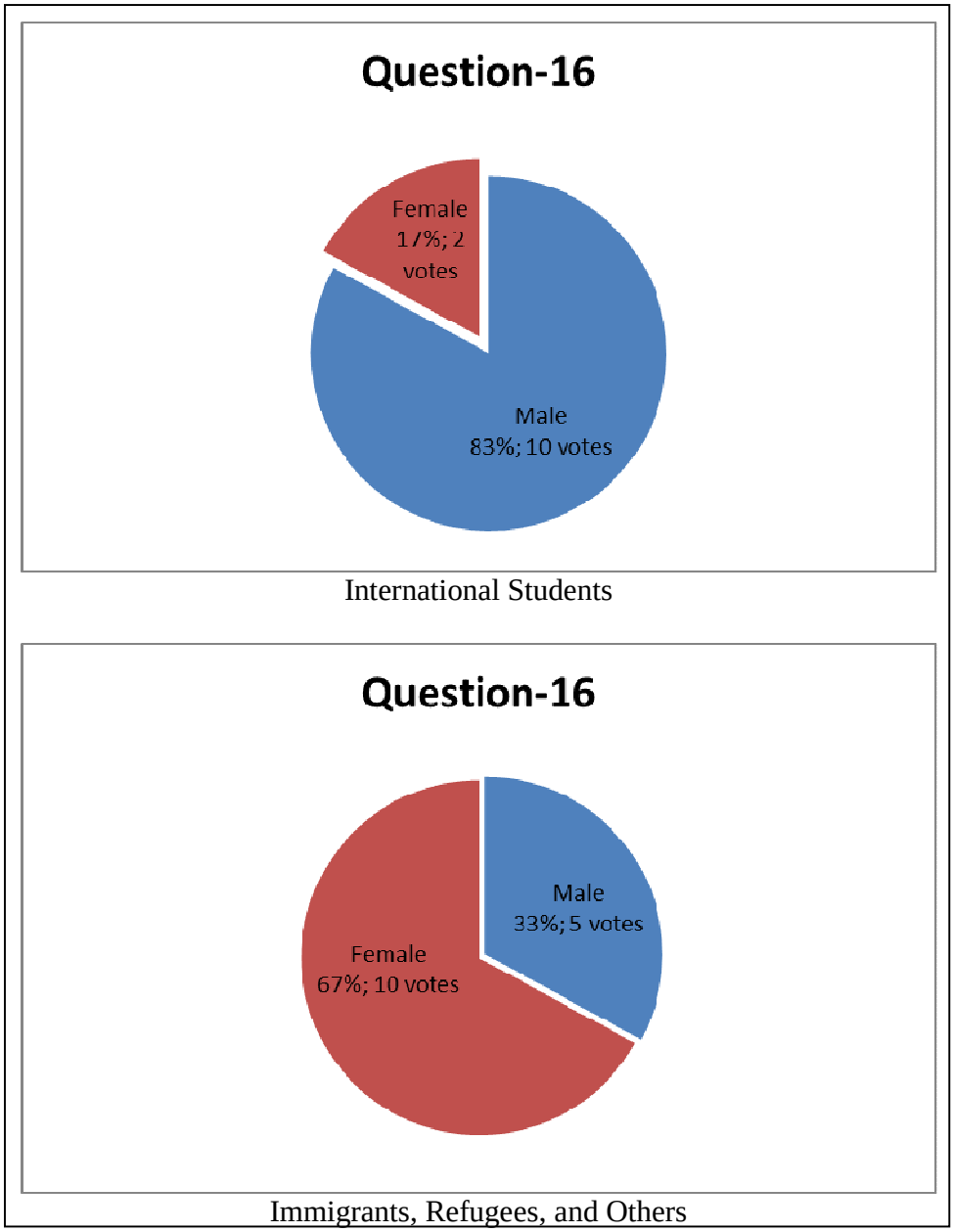


Figure 5 A Comparison between Section 4.8.1 and Section 4.8.2 of Question 16

As shown in Figure 5, there is a huge dissimilarity between international students and immigrants, refugees, and others when it comes to genders' comparison.

6. The number of years that international students have used computers in comparison with immigrants, refugees, and others.

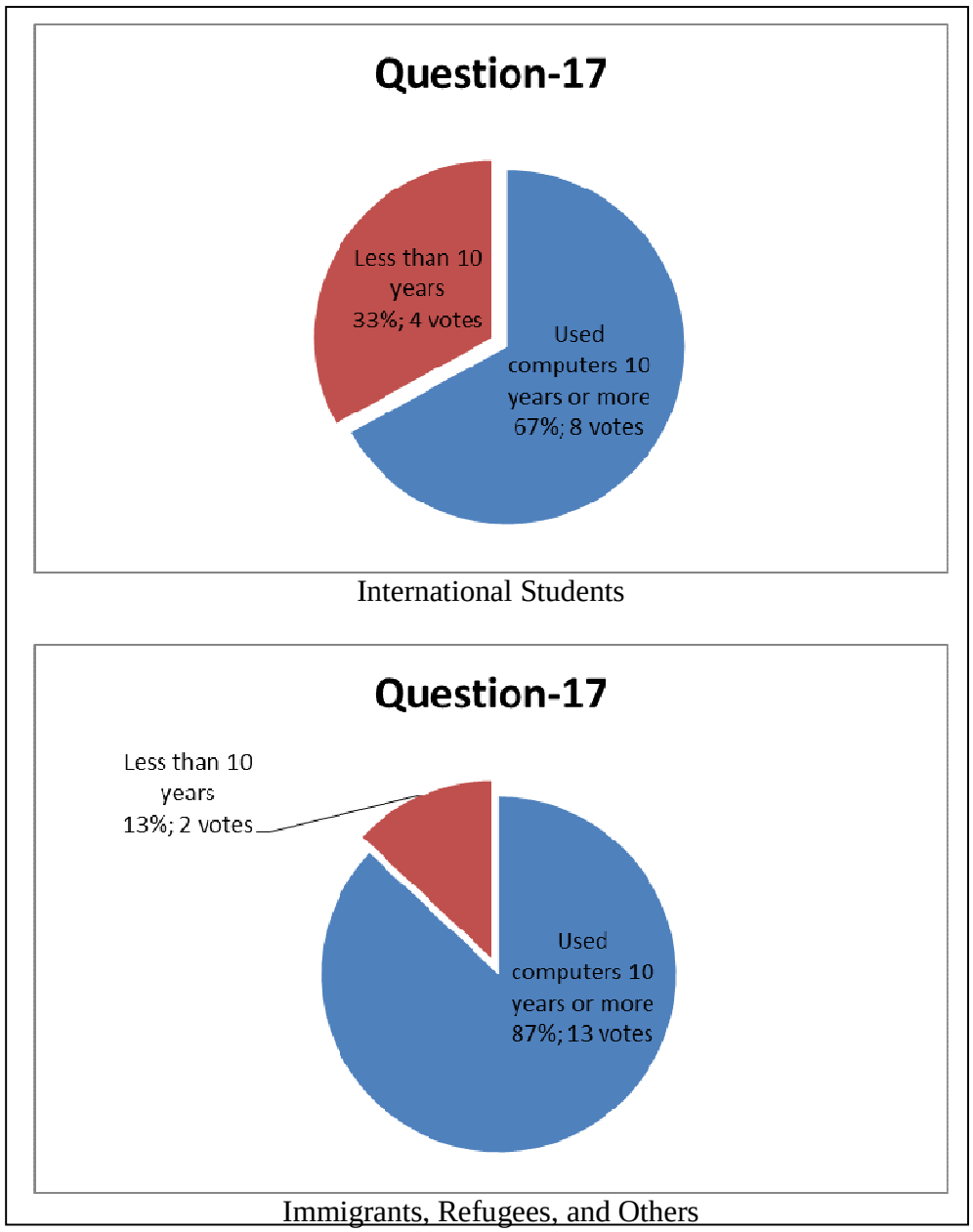


Figure 6 A Comparison between Section 4.8.1 and Section 4.8.2 of Question 17

As shown in Figure 6, the number of international students participants who have used computers for ten years or more, is far less than the number of immigrants, refugees, and others participants who have used computers for ten years or more.

Appendix I The Comparisons Between women and men from Section 4.8.3 and Section 4.8.4

1. The paralingual webpage layout participants' preference, as it was acknowledged in question one.

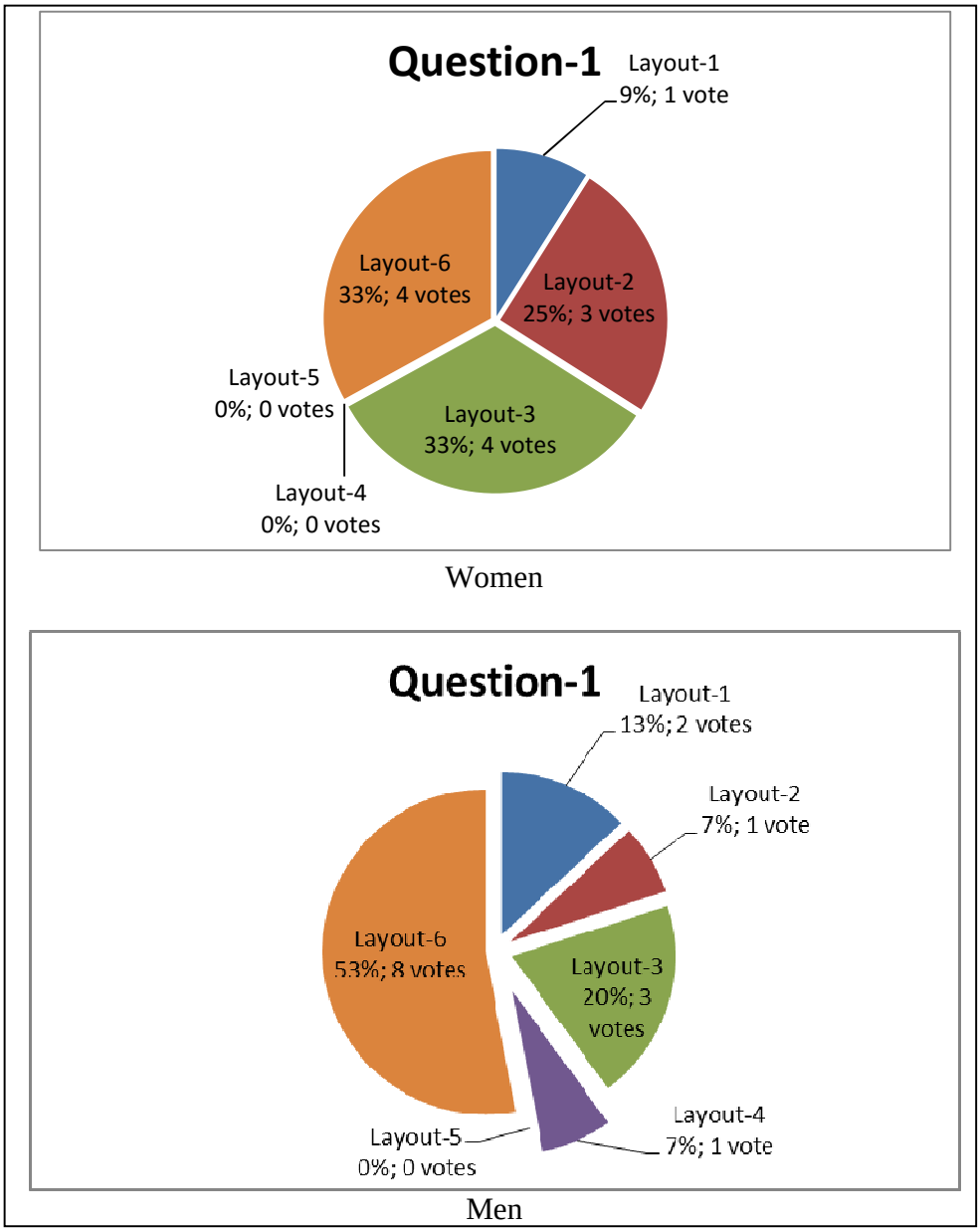


Figure 1 A Comparison between Section 4.8.3 and Section 4.8.4 of Question 1

As shown in Figure 1, the majority of both women and men participants have selected the paralingual webpage layout six.

2. Ranking or rating the paralingual webpage layouts, as it was acknowledged in question four.

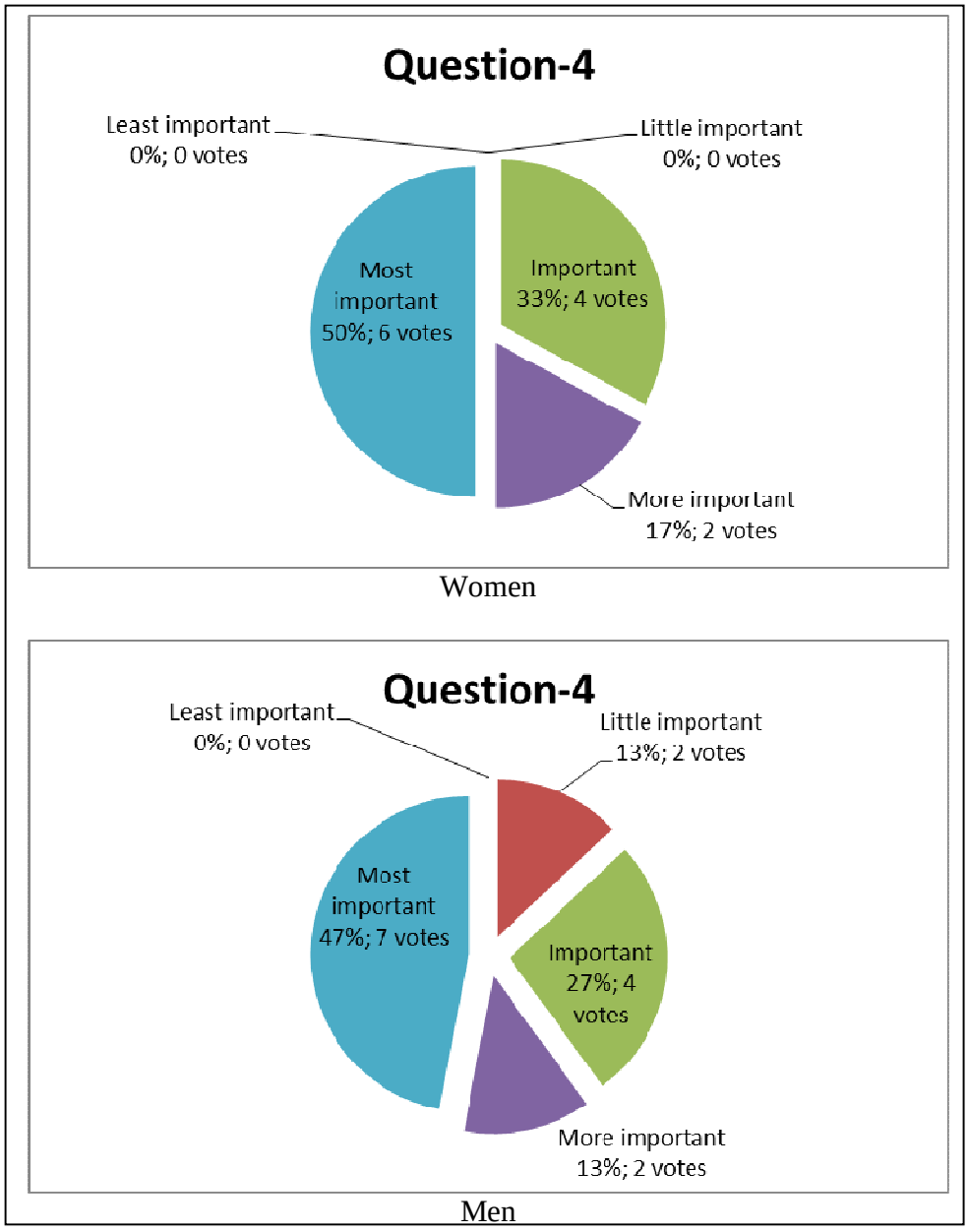


Figure 2 A Comparison between Section 4.8.3 and Section 4.8.4 of Question 4

As shown in Figure 2, both of women and men participants have rated the paralingual webpage layouts as the most important.

3. This relationship shows the participants' age between women and men, as acknowledged in question eight.

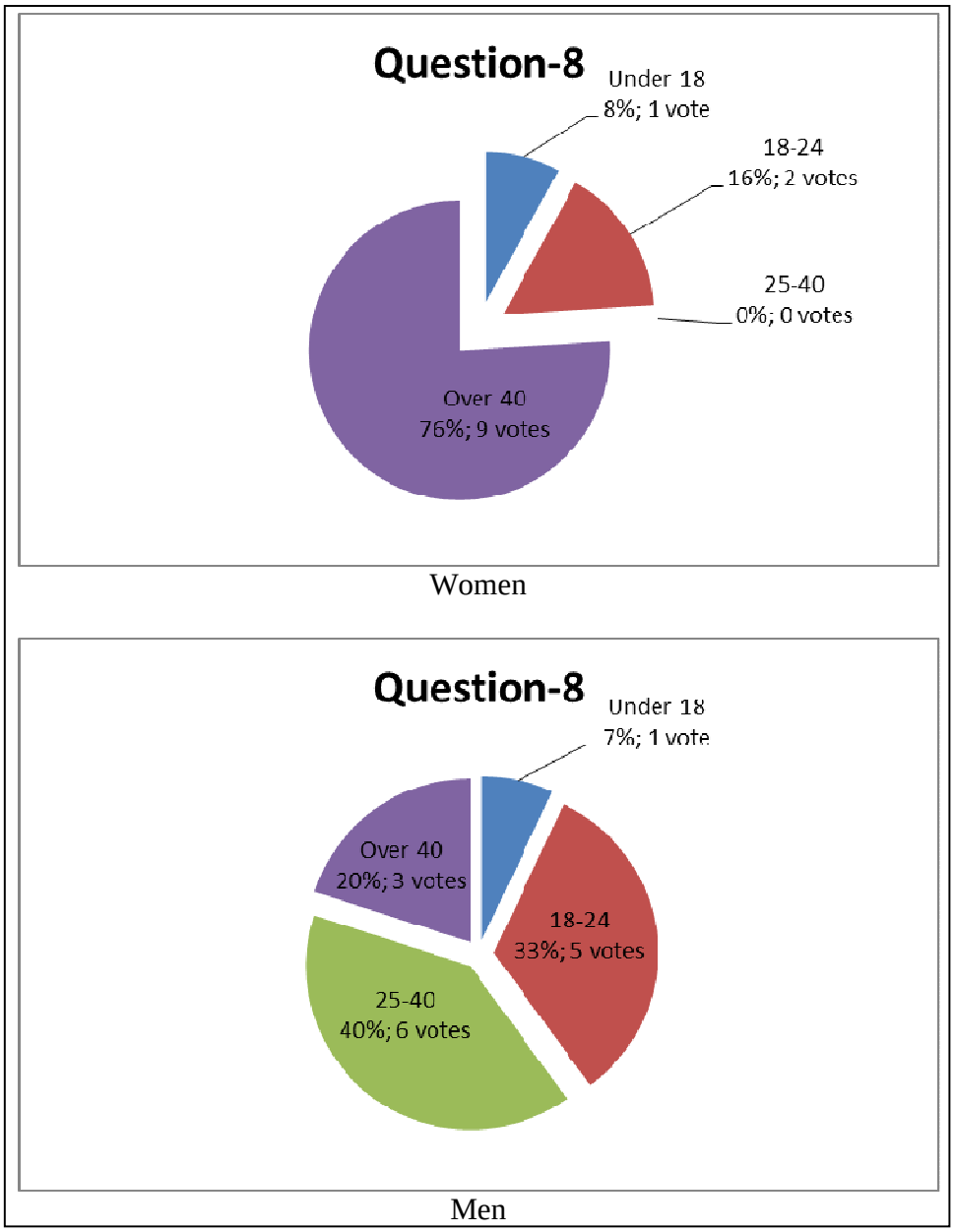


Figure 3 A Comparison between 4.8.3 Section 4.8.4 of Question 8

As shown in Figure 3, the women's participants who were over forty years old were more than the men's participants who were over forty years old.

4. The immigration status of women and men, as acknowledged in question ten.

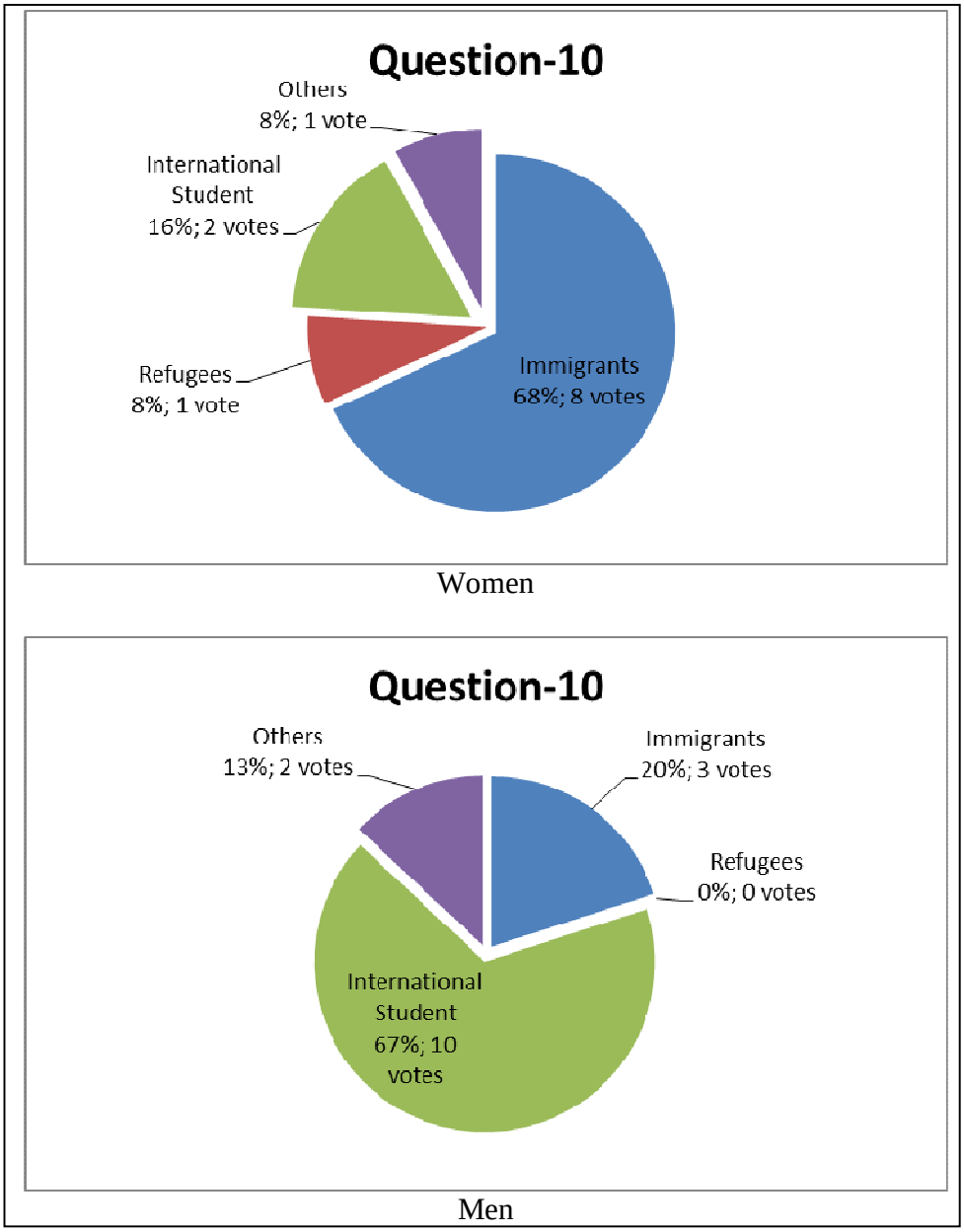


Figure 4 A Comparison between Section 4.8.3 and Section 4.8.4 of Question 10

As shown in Figure 4, the majority of men's participants were international students, whereas the majority of the women's participants were immigrants.

5. Time spent online daily among women compared to men, as acknowledged in question eleven.

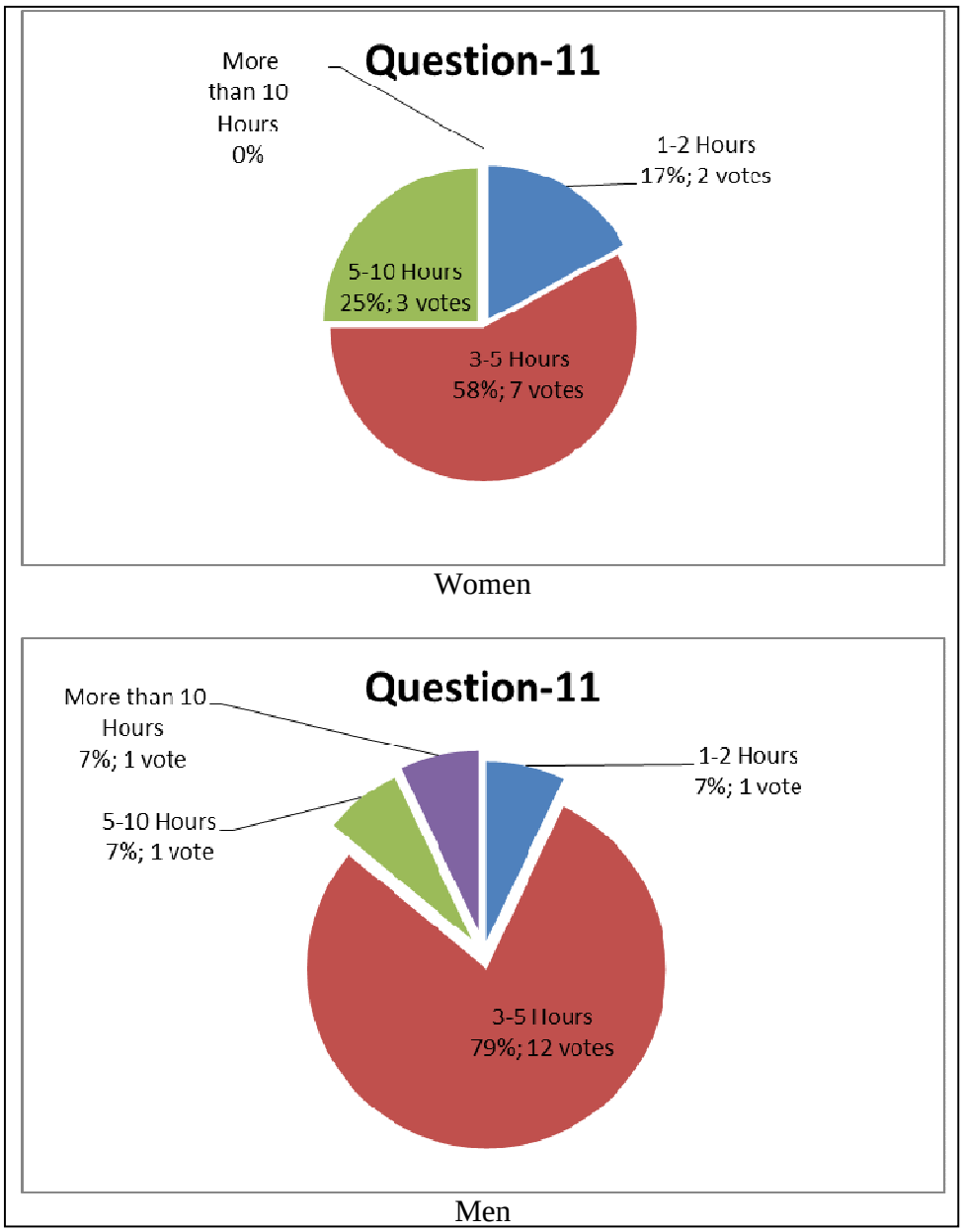


Figure 5 A comparison between Section 4.8.3 and 4.8.4 of Question 11

As shown Figure 5, the number of men's participants who spent three to five hours online daily were more than the women's participants who spent three to five hours online daily.

6. The number of years that women have used computers in comparison with men.

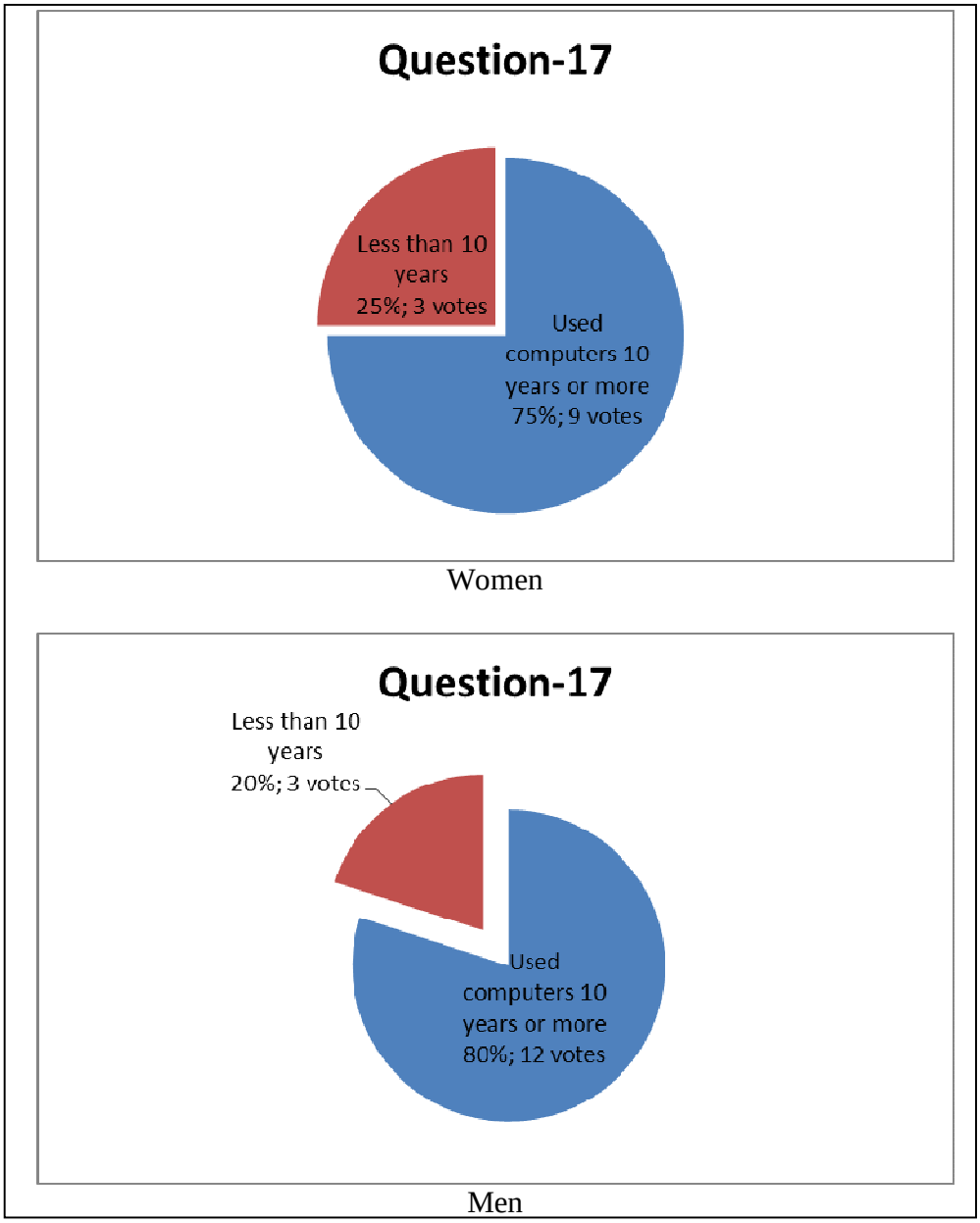


Figure 6 A Comparison between Section 4.8.3 and 4.8.4 of Question 17

As shown in Figure 6, the number of men's participants who used computers ten years or more were more than the number of women's participants who used computers for ten years or more.

Appendix J The technical Specifications of the Mirametrix Eye Tracker

Figure 1 shows the equipment setup of the eye tracker in the HCI lab, where the experiment preformed.

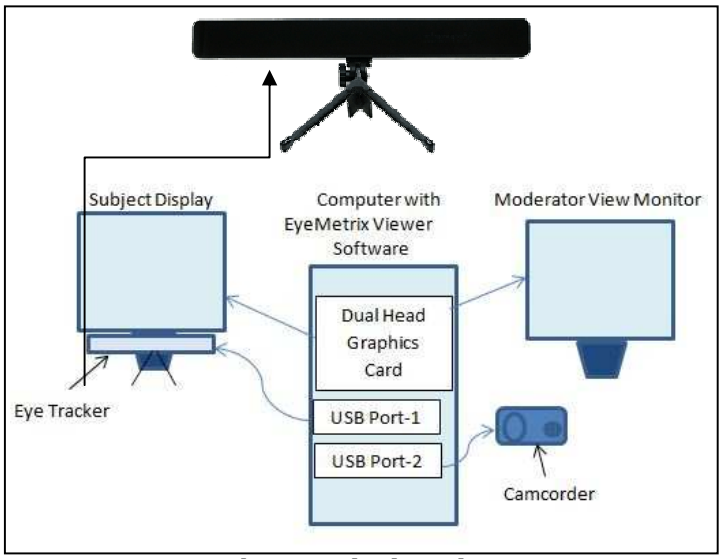


Figure 1 Eye tracker Standard Moderator View Setup

The followings are the steps for setting up the Mirametrix S2 Eye Tracker:

1. First, connect the computer video port-1 to the Subject Display.
2. Connect the computer video port-2 to the Moderator View Monitor.
3. Connect S2 eye tracker to the computer via USB.
4. Position the Eye Tracker beneath the Subject Display (the monitor the participant will be using), should be approximately arms-length from the face of the participants, approximately 65cm (Mirametrix (a), 2011, p. 14).
5. Set the Subject Display as the main display and Moderator View Monitor as the extended desktop.
6. Second, use the User-Guide to install the Tracker software.
7. The Tracker software provides the eye-gaze tracking functionality for determining where the participant is looking on the screen. The main window of Tracker shows a real-time image from the camera with the left and right eye identified (Mirametrix (a), 2011, p. 5).
8. The Calibration button located on the top right hand side as shown in Figure 2 begins the calibration procedure which is required for accurate eye tracking, by looking at a sequence of nine points on the screen. The Depth Estimate bar on the left

hand side indicates the participant's head position, where the centre of the green is the ideal head position (Mirametrix (a), 2011, p. 6).

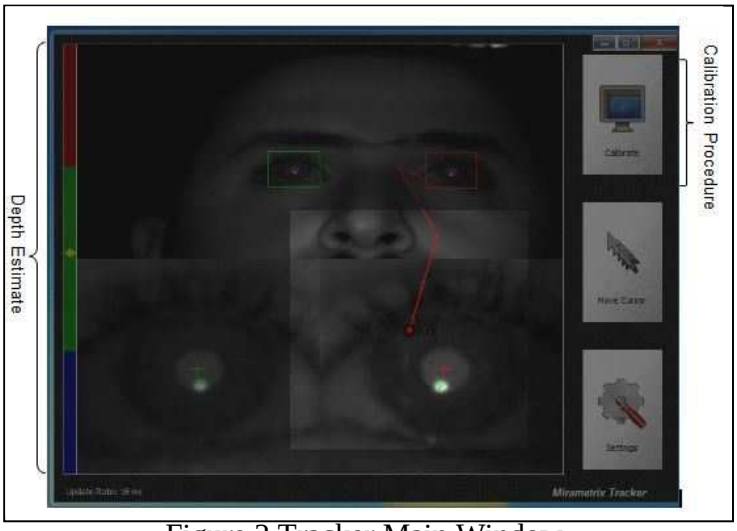


Figure 2 Tracker Main Window

9. The Mirametrix viewer provides fast and efficient method for observing exactly where someone is looking on a screen, the viewer will overlay scan path showing fixations and saccades on a video of the desktop screen. The video recording can be saved for offline viewing (Mirametrix (b), 2011, p. 3).

10. "Fixation Highlight" option was selected in this experiment instead of using the Heatmap option because:

a. This option has not used in eye tracking experiments before.

b. This option was more precise and more accurate.

An example of the Fixation Highlight on the screen is shown in Figure 3

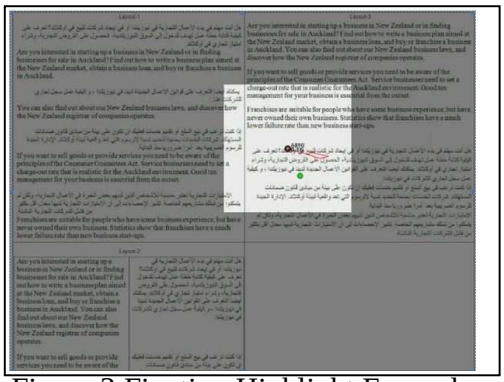


Figure 3 Fixation Highlight Example

1. Figure 4, Figure 5, and Figure 6 show layouts 1, 2, and 3 respectively, layouts similar to them were used in the three separate webpages. Their positions on

each of the webpages were rearranged, and their contents were changed as well, this way the participant would be offered many options.

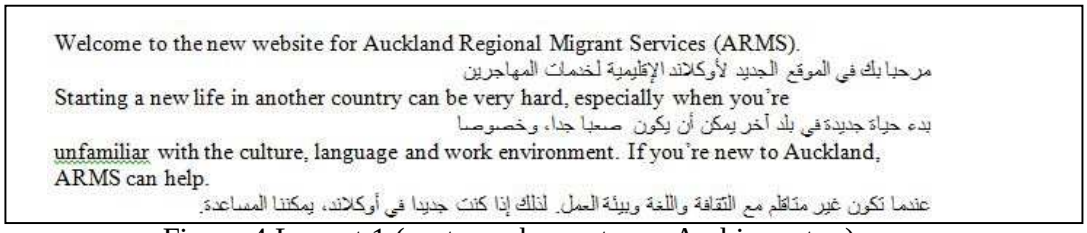


Figure 4 Layout 1 (sentence by sentence Arabic on top)

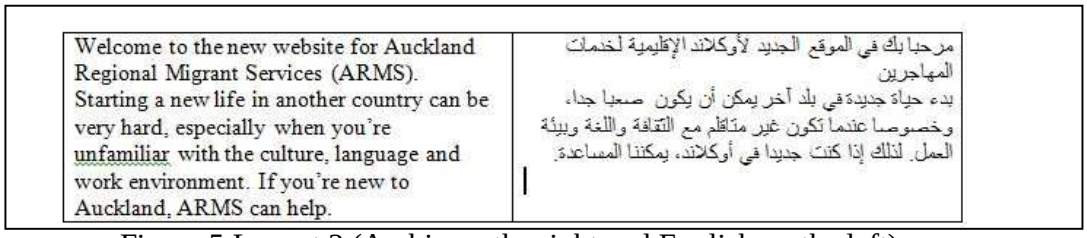


Figure 5 Layout 2 (Arabic on the right and English on the left)

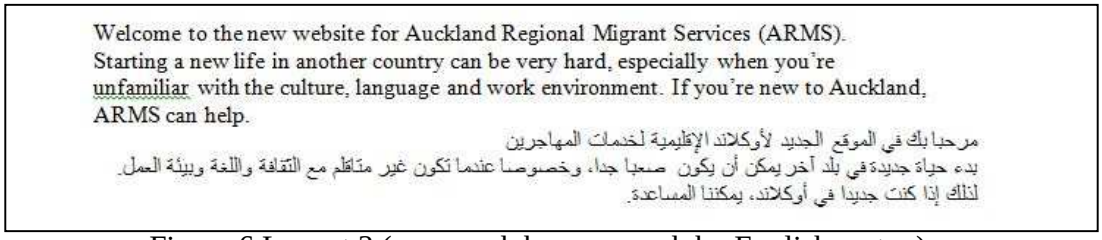


Figure 6 Layout 3 (paragraph by paragraph by English on top)

Appendix K The Eye Tracking Experiment Results

Appendix K The Eye Tracking Experiment Results

Table 1 shows that Participant 1 spent more time reading Layout 3 (paragraph by paragraph English on top) as his preferred layout on all of the three webpages.

Table 1 Participant 1 Video Results

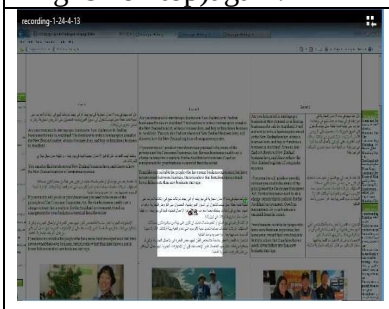
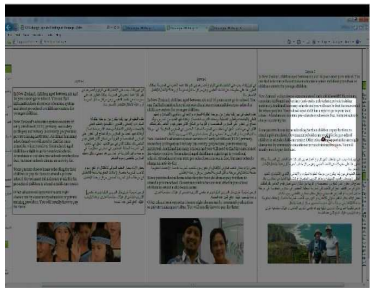
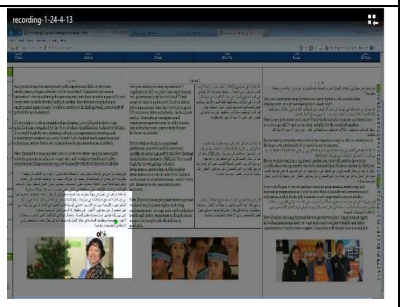
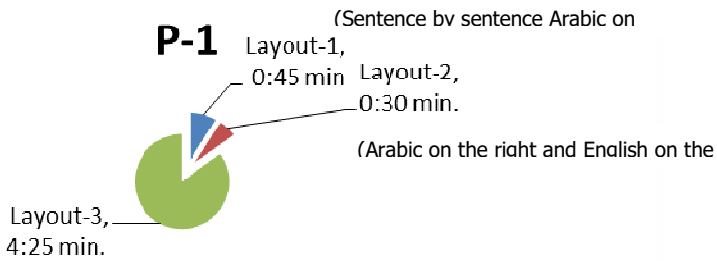
Webpage-1 (Total = 2:15 Minutes)	**Webpage-2 (Total = 1:30 Minutes)**	**Webpage-3 (Total = 2:00 Minutes)**
Area of Interest-1 (AOI-1) P 1 started looking at Layout 3 (paragraph by paragraph English on top)as AOI that was positioned in the middle. Started with the Arabic text then looked to the English text for 1 second. P 1 spent 45 seconds. **AOI-2** After 45 seconds, the second AOI-2 becameLayout 1 (sentence by sentence Arabic on top) for only 15 seconds. **AOI-3** P 1 spent another 1:15 minutes looking at Layout 3 (paragraph by paragraph English on top)again.	**AOI-1** P 1 started looking at Layout 2 (Arabic on the right and English on the left) for 15 seconds. **AOI-2** P 1 looked at Layout 1 (sentence by sentence Arabic on top) for another 15 seconds. **AOI-3** P 1 started reading Layout 3 (paragraph by paragraph English on top)for 1 minute.	**AOI-1** P 1 started looking at Layout 1 (sentence by sentence Arabic on top) for 15 seconds. **AOI-2** P 1 started looking at Layout 2 (Arabic on the right and English on the left) for another 15 seconds. **AOI-3** P 1 continued showing interest in looking at Layout 3 (paragraph by paragraph English on top)for 1:25 minutes.
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**
(Paragraph by paragraph English on		

Table 2 shows that Participant 2 spent more time reading Layout 2 (Arabic on the right and English on the left) as his preferred layout on webpage 2 & 3, and he spent more time reading Layout 3 (paragraph by paragraph English on top)on webpage-1.P 3 did not have different selections on alternate webpages.

Table 2 Participant 2 Video Results

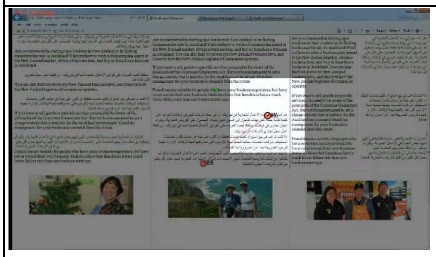
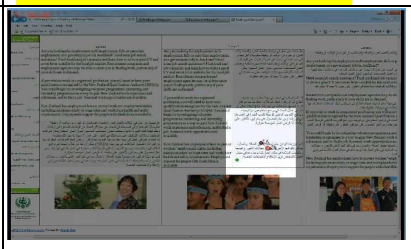
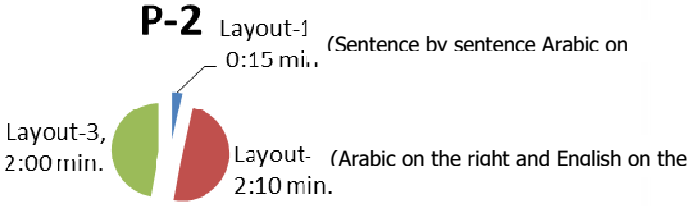
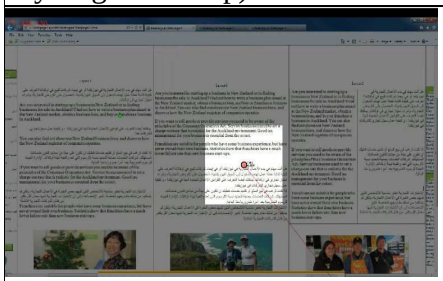
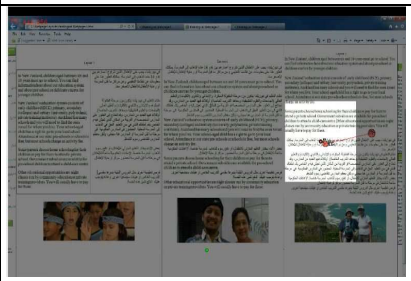
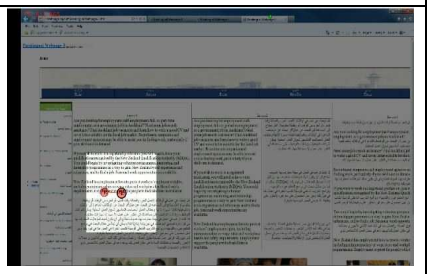
Webpage-1 (Total = 2:00 Minutes)	**Webpage-2 (Total = 1:10 Minutes)**	**Webpage-3 (Total = 0:45 Minutes)**
Area of Interest-1 (AOI-1) P 2 Started strait away reading Layout 3 (paragraph by paragraph English on top) and he spent two minutes reading the Arabic translation.	**AOI-1** P 2 started this time reading Layout 2 (Arabic on the right and English on the left), he spent 48 seconds reading the Arabic translation then he started reading the English text and he spent 22 sends only.	**AOI-1** This time P 2 looked at all three layouts, this action took 15 seconds. **AOI-2** P 2 started reading the English text of Layout 2 (Arabic on the right and English on the left) and after 20 seconds he looked a word in the Arabic translation, then he continued reading Layout 2 (Arabic on the right and English on the left) in English. P 2 spent 45 seconds on reading Layout 2 (Arabic on the right and English on the left). After 15 seconds he looked another word's translation.
		
Webpage-1	**Webpage-2**	**Webpage-3**
(Paragraph by paragraph English on		

Table 3 shows that Participant 3 spent more time reading Layout 3 (paragraph by paragraph English on top)on all of the three pages, and he also looked up the translations of English words in Arabic.

Table 3 Participant 3 Video Results

Webpage-1 (Total = 3:15 Minutes)	**Webpage-2 (Total = 1:30 Minutes)**	**Webpage-3 (Total = 2:00 Minutes)**
Area of Interest-1 (AOI-1) P 3 Spent 30 seconds looking at all three layouts. **AOI-2** P 3 started reading Layout 3 (paragraph by paragraph English on top)the English text, he looked for translation in Arabic. P 3 spent 1:15 minutes on reading Layout 3 (paragraph by paragraph by English on top). **AOI-3** P 3 shifted to reading Layout 1 (sentence by sentence Arabic on top) on the left corner, he spent 30 seconds. **AOI-4** P 3 went back to reading Layout 3 (paragraph by paragraph English on top)positioned in the middle of the page. During reading the English text he looked three times to words' translations in Arabic. P 3 spent 1:30 minutes reading Layout 3 (paragraph by paragraph by English on top).	**AOI-1** P 3 started reading Layout 3 (paragraph by paragraph English on top)positioned on the right hand corner of the screen, he started reading the English text, and looked for words' translations two times. He started reading the Arabic translation. P 3 spent 1:30 minutes.	**AOI-1** P 3 started reading the English text of Layout 3 (paragraph by paragraph by English on top), he spent 1:30 minute and then he looked for Arabic translation of English words three times. He started reading the Arabic text for 30 seconds.
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**

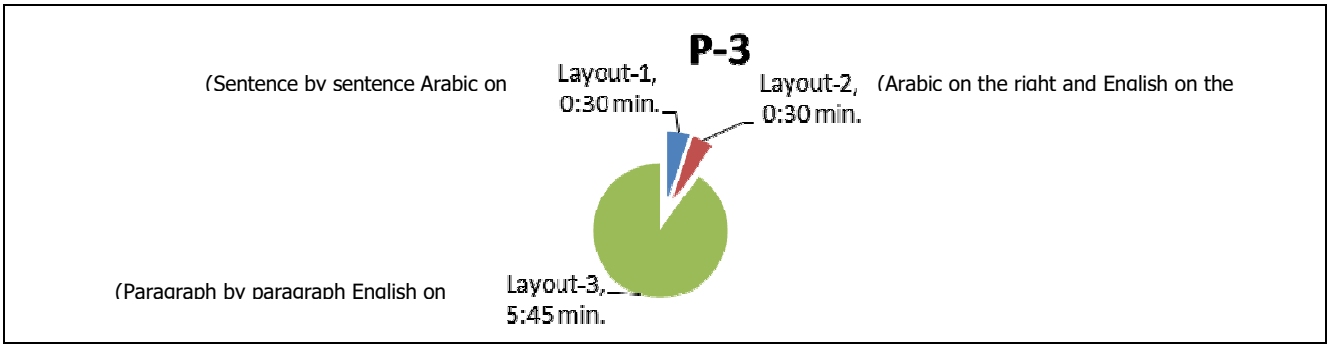
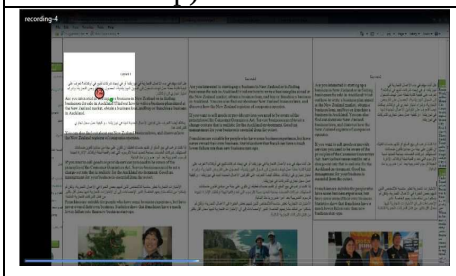
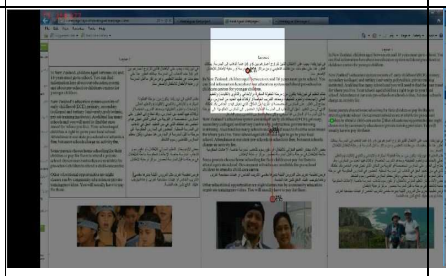
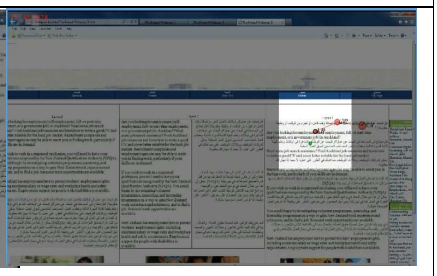


Table 4 shows that Participant 4 spent more time reading Layout 1 (sentence by sentence Arabic on top) on all of the three pages and he looked up the translation of English words in Arabic.

Table 4 Participant 4 Video Results

Webpage-1 (Total = 3:30 Minutes)	Webpage-2 (Total = 2:55 Minutes)	Webpage-3 (Total = 2:15 Minutes)
Area of Interest-1 (AOI-1) P 4 Spent 20 seconds looking at all three layouts. **AOI-2** P 4 started reading Layout 1 (sentence by sentence Arabic on top) the line by line presentation. He looked for difficult English words two times during reading Layout 1 (sentence by sentence Arabic on top). P 4 spent 3:30 minutes on reading Layout 1 (sentence by sentence Arabic on top)	**AOI-1** P 4 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen, and he looked up difficult English words in Arabic three times. P 4 spent 2:55 on reading Layout 1 (sentence by sentence Arabic on top)	**AOI-1** P 4 started reading the English text of Layout 1 (sentence by sentence Arabic on top); he continued reading line by line, the Arabic translation, and then the English text. P 4 spent 2:15 on reading Layout 1 (sentence by sentence Arabic on top).
		
Webpage-1	**Webpage-2**	**Webpage-3**

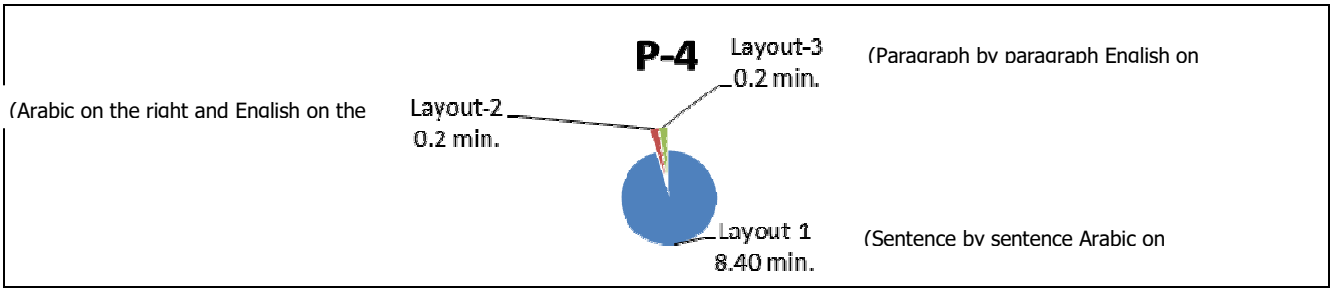


Table 5 shows that Participant 5 spent more time reading Layout 3 (paragraph by paragraph English on top) on webpages 1 &3, and he spent more time reading Layout 2 (Arabic on the right and English on the left) on webpage-2.

Table 5 Participant 5 Video Results

Webpage-1 (Total = 9:08 Minutes)	**Webpage-2 (Total = 7:40 Minutes)**	**Webpage-3 (Total = 4:00 Minutes)**
Area of Interest-1 (AOI-1) P 5 Spent 44 seconds looking at all three layouts. **AOI-2** P 5 started looking at Layout 3 (paragraph by paragraph English on top)for 1:10 minutes. **AOI-3** P 5 is now reading through Layout 2 (Arabic on the right and English on the left). P 5 spent 1:14 on reading Layout 2 (Arabic on the right and English on the left). **AOI-4** P 5 is looking again at Layout 3 (paragraph by paragraph by English on top), and reading the Arabic translation, now reading through the English text. He spent 6:00 minutes reading through Layout 3 (paragraph by paragraph by English on top).	**AOI-1** P 5 started reading Layout 3 (paragraph by paragraph English on top)positioned in the right hand corner of the screen. It took him 3:30 minutes till he changed his AOI. **AOI-2** P 5 started reading through Layout 1 (sentence by sentence Arabic on top) in the middle of the screen. P 5 spent 1:20 minutes on reading Layout 1 (sentence by sentence Arabic on top). **AOI-3** P 5 changed his AOI after 1:35 minutes to reading the English text on Layout 2 (Arabic on the right and English on the left), started with the Arabic text, it took him 1:10 minutes. The he started reading the English text. P 5 looked up for the translation of English words in Arabic. P 5 spent 2:45 minutes reading Layout 2 (Arabic on the right and English on the left).	**AOI-1** P 5 started reading the English text of Layout 1 (sentence by sentence Arabic on top), he continued reading line by line, the Arabic translation, then the English text. P 5 spent 3:00 minutes reading through Layout 1 (sentence by sentence Arabic on top). **AOI-2** P 5 is now reading through Layout 2 (Arabic on the right and English on the left). Stated with the English text, then he looked up the translation of an English word in Arabic. P 5 spent 1 minute reading Layout 2 (Arabic on the right and English on the left). **AOI-3** P 5 started reading through Layout 3 (paragraph by paragraph English on top)starting with the English text. P 5 spent 50 seconds reading through Layout 3 (paragraph by paragraph by English on top). **AOI-4**

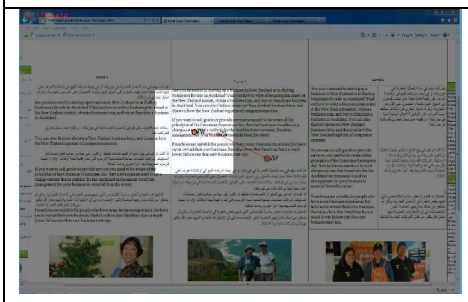
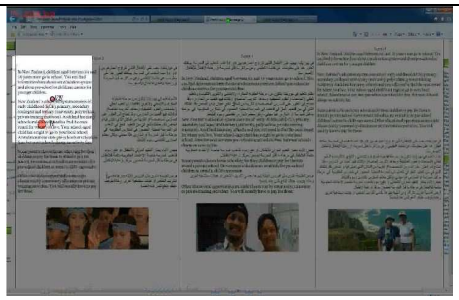
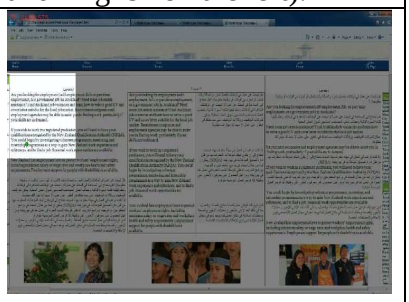
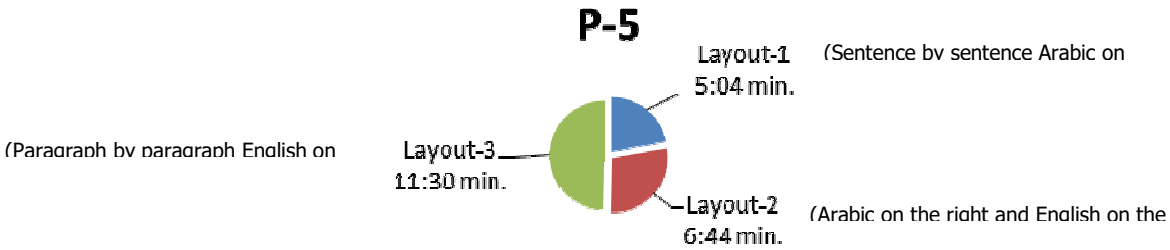
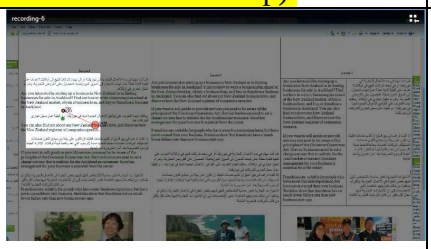
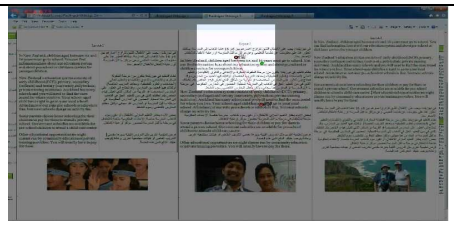
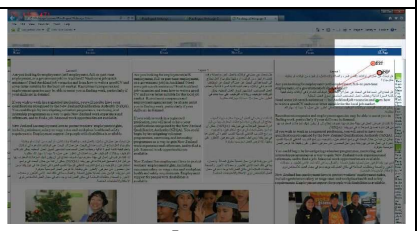
		P 5 again was reading Layout 2 (Arabic on the right and English on the left) started with the Arabic translation, and then started reading the English text. P 5 Looked for translation of English words in Arabic. P 5 spent 2 minutes reading Layout 2 (Arabic on the right and English on the left).
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**
		

Table 6 shows that Participant 6 spent more time reading Layout 1 (sentence by sentence Arabic on top) on all of the three webpages.

Table 6 Participant 6 Video Results

Webpage-1 (Total = 10:45 Minutes)	**Webpage-2 (Total = 10:10 Minutes)**	**Webpage-3 (Total = 8:40 Minutes)**
Area of Interest-1 (AOI-1) P 6 started looking at Layout 1 (sentence by sentence Arabic on top) for 20 seconds then Layout 3 (paragraph by paragraph by English on top), then back to Layout 1 (sentence by sentence Arabic on top) positioned in the left hand corner of the screen. P 6 spent 10:45 minutes on reading Layout 1 (sentence by sentence Arabic on top)	**AOI-1** P 6 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen. P 6 Looked up English words for translation in Arabic at least three times. P 6 spent 10:10 minutes on reading Layout 1 (sentence by sentence Arabic on top).	**AOI-1** P 6 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen. P 6 looked up English words for translation in Arabic three times. P 6 spent 8:40 minutes on reading Layout 1 (sentence by sentence Arabic on top).

<table>
<tr><td>It was easier for P 6 to lookup English words instantaneously translations in Arabic while reading Layout 1 (sentence by sentence Arabic on top).</td><td></td><td></td></tr>
<tr><td> 
Webpage-1</td><td> 
Webpage-2</td><td> 
Webpage-3</td></tr>
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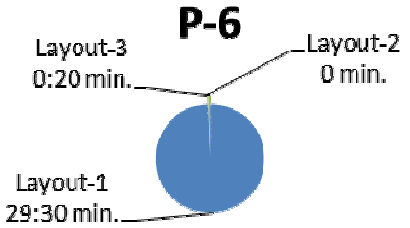
(Sentence by sentence Arabic on
 

(Arabic on the right and English on the</td></tr>
</table>

Table 7 shows that Participant 7 spent more time on reading Layout 1 (sentence by sentence Arabic on top) on webpages 1, 2, and 3.

Table 7 Participant 7 Video Result

Webpage-1 (Total = 3:25 Minutes)	**Webpage-2 (Total = 3:15 Minutes)**	**Webpage-3 (Total = 3:00 Minutes)**
Area of Interest-1 (AOI-1) P 7 started reading Layout 1 (sentence by sentence Arabic on top) for 3:05 minutes, positioned in the left hand corner of the screen. P 7 looked up English words for translation in Arabic two times. **AOI-2** P 7 Changed his AOI to Layout 2 (Arabic on the right and English on the left) for 20 seconds only.	**AOI-1** P 7 started looking at Layout 2 (Arabic on the right and English on the left) positioned in the left hand corner of the screen for 15 seconds **AOI-2** P 7 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen. P 7 took 3:00 minutes reading Layout 1 (sentence by sentence Arabic on top). P 7 looked up English words for translation in Arabic three times.	**AOI-1** P 7 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen. P 7 took 2:15 minutes. P 7 looked up English words for translation in Arabic three times. **AOI-2** P 7 Changed his AOI from Layout 1 (sentence by sentence Arabic on top) to Layout 2 (Arabic on the right and English on the left) only for 30 seconds. **AOI-3** P 7 Changed his AOI to Layout 1 (sentence by sentence Arabic

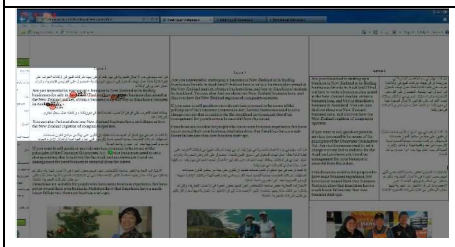
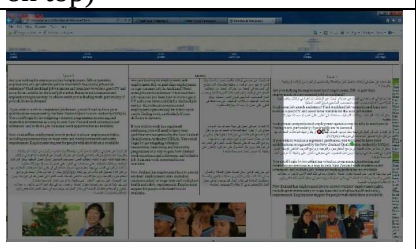
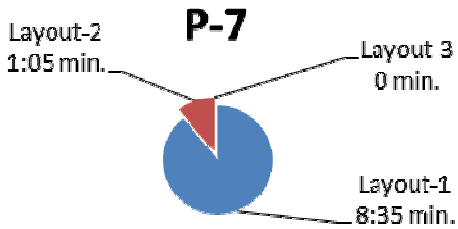
		on top) again and continued reading through it. P 7 took another 15 seconds to continue reading Layout 1 (sentence by sentence Arabic on top)
		
Webpage-1	**Webpage-2**	**Webpage-3**
(Arabic on the right and English on the		(Paragraph by paragraph English on (Sentence by sentence Arabic on

Table 8 shows that Participant 8 spent more time reading Layout 1 (sentence by sentence Arabic on top) on all of the three webpages.

Table 8 Participant 8 Video Results

Webpage-1 (Total = 2:35 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 2:50 Minutes)**
Area of Interest-1 (AOI-1) P 8 looked at all layouts for 10 seconds. **AOI-2** P 8 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the left hand corner of the screen for 2:35 minutes. P 8 looked up English words for translation in Arabic five times.	**AOI-1** P 8 started looking at Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen for 2 minutes. P 8 looked up English words for translation in Arabic five times.	**AOI-1** P 8 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen for 2:50 minutes. P 8 looked up English words for translation in Arabic four times.

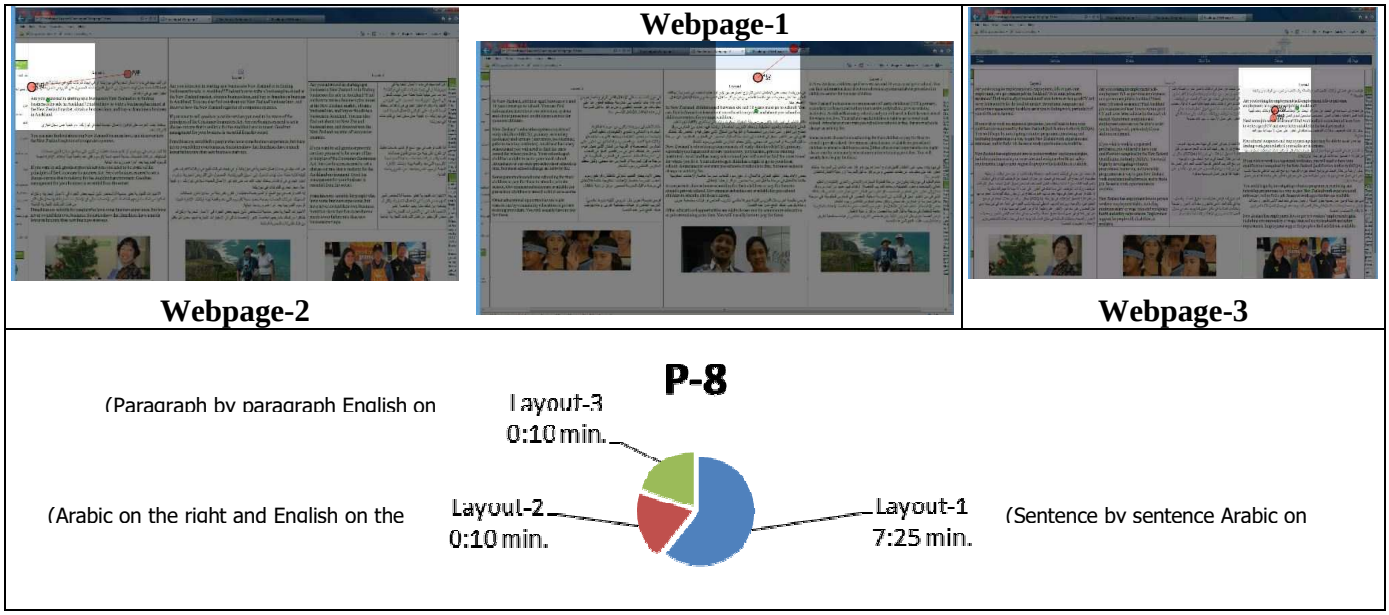
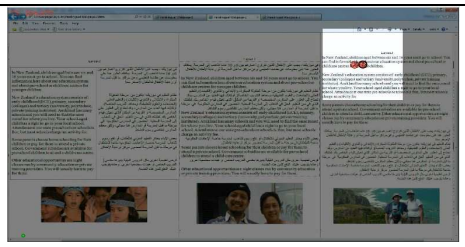
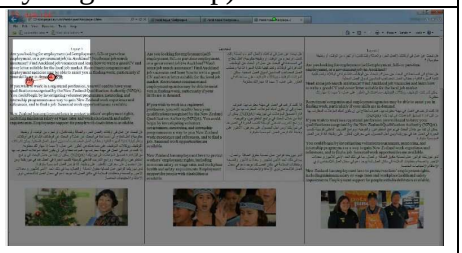


Table 9 shows that Participant 9 spent more time reading Layout 3 (paragraph by paragraph English on top)on all of the three pages.

Table 9 Participant 9 Video Results

Webpage-1 (Total = 3:00 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 2:23 Minutes)**
Area of Interest-1 (AOI-1) P 9 started looking at all three layouts for 30 seconds. **AOI-2** P 9 started reading through the English text of Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen, for three minutes.	**AOI-1** P 9 started reading through Layout 3 (paragraph by paragraph by English on top), positioned on the right hand corner of the screen. P 9 spent 2:00 minutes reading Layout 3 (paragraph by paragraph by English on top).	**AOI-1** P 9 Started looking at Layout 2 (Arabic on the right and English on the left) for one minute. **AOI-2** P 9 started reading through Layout 3 (paragraph by paragraph English on top) positioned in the left hand corner of the screen. P 9 spent 1:23 minutes reading Layout 3 (paragraph by paragraph by English on top).
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**

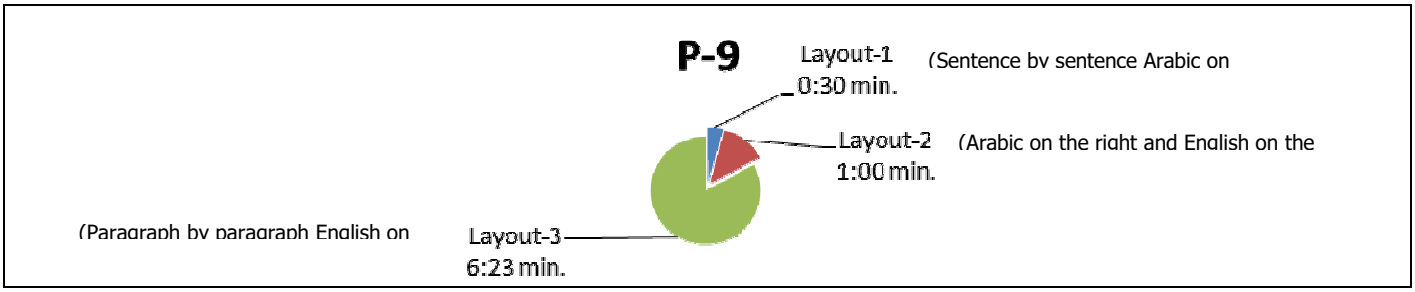
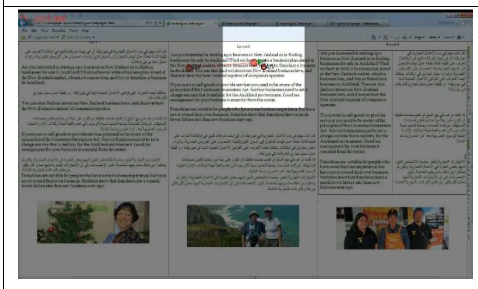
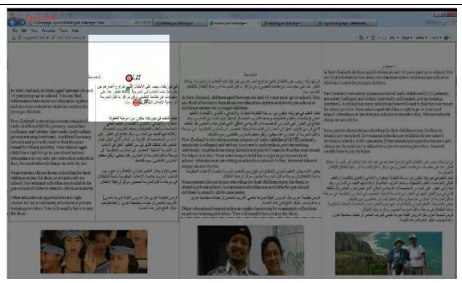
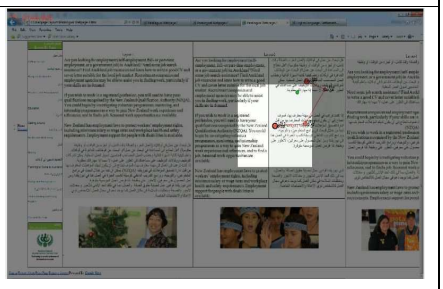


Table 10 shows that Participant 10 spent more time reading Layout 2 (Arabic on the right and English on the left) on webpages 2 & 3 compared to reading Layout 3 (paragraph by paragraph English on top)on webpage-1.

Table 10 Participant 10 Video Results

Webpage-1 (Total =1:55 Minutes)	**Webpage-2 (Total = 1:00 Minutes)**	**Webpage-3 (Total = 2:23 Minutes)**
Area of Interest-1 (AOI-1) P 10 started reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand corner of the screen. He started reading the English text, it took him 55 seconds. Then he started reading the Arabic translation of Layout 2 (Arabic on the right and English on the left). **AOI-2** P 10 started reading through Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen. He read the English text first and it took him 1 minute.	**AOI-1** P 10 started reading through Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, this time he started reading the Arabic translation first. P 10 took 1:00 minute reading Layout 2 (Arabic on the right and English on the left).	**AOI-1** P 10 started reading through Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen for 2 minutes. **AOI** P 10 changed his AOI to Layout 3 (paragraph by paragraph English on top) positioned on the left hand corner of the screen. P 10 took 23 seconds reading through Layout 3 (paragraph by paragraph by English on top).
		
Webpage-1	**Webpage-2**	**Webpage-3**

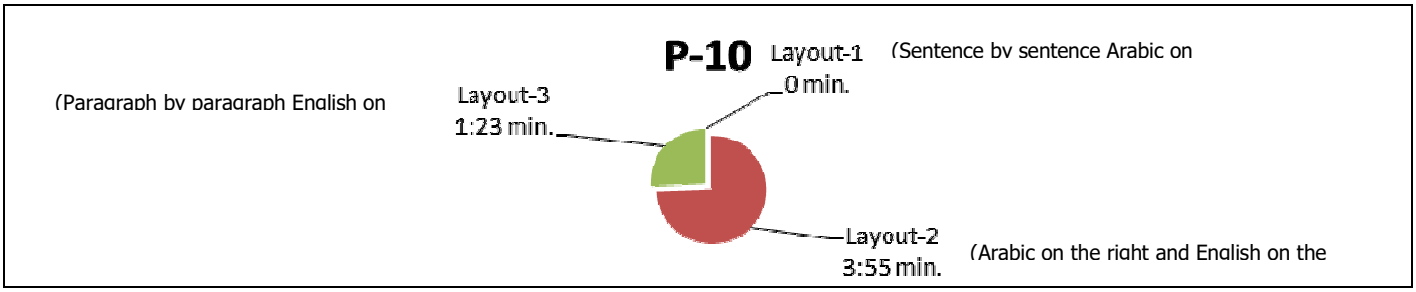
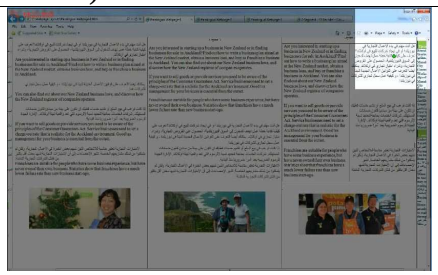
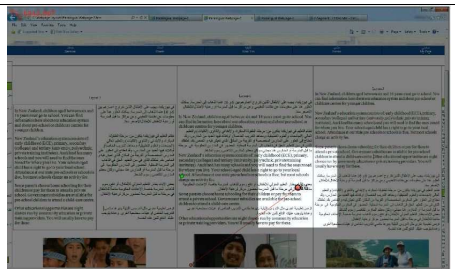
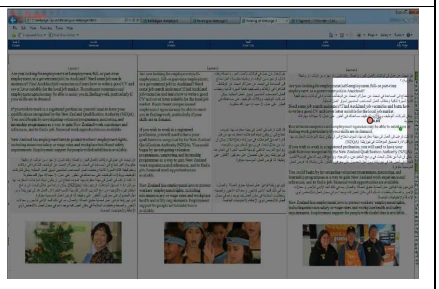


Table 11 shows that Participant 11 more time reading Layout 1 (sentence by sentence Arabic on top) on webpages 2 & 3 compared to the time spent on reading Layout 2 (Arabic on the right and English on the left) on webpage-1.

Table 11 Participant 11 Video Results

Webpage-1 (Total = 1:45 Minutes)	**Webpage-2 (Total = 3:00 Minutes)**	**Webpage-3 (Total = 2:20 Minutes)**
Area of Interest-1 (AOI-1) P 11 started looking at Layout 1 (sentence by sentence Arabic on top) positioned in the left hand side corner of the screen for 20 seconds. **AOI-2** Then P 11 started reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand corner of the screen. He started reading the Arabic translation first; it took him 1:25 minutes. Then he started reading the English text of Layout 2 (Arabic on the right and English on the left).	**AOI-1** P 11 started reading through Layout 1 (sentence by sentence Arabic on top) for 3 minutes positioned in the middle of the screen.	**AOI-1** P 11 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen. P 11 spent 2:20 minutes reading Layout 1 (sentence by sentence Arabic on top).
		
Webpage-1	**Webpage-2**	**Webpage-3**

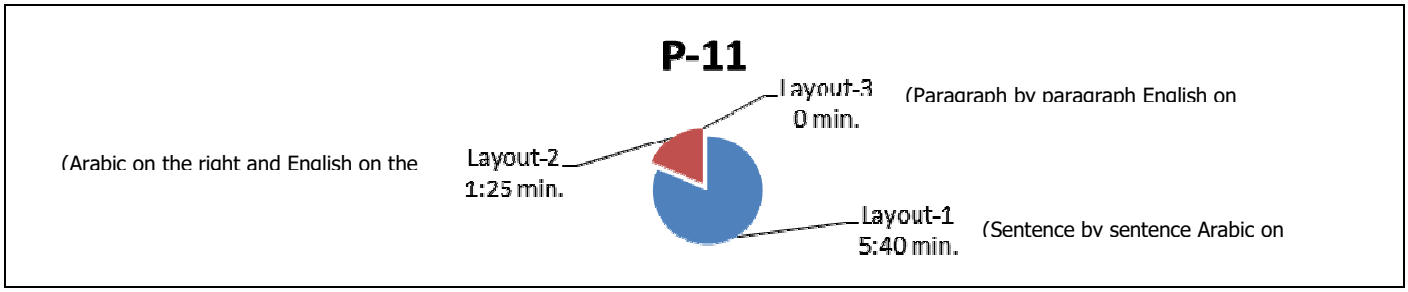
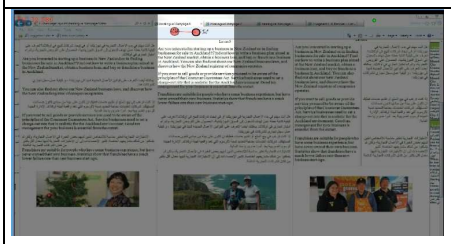
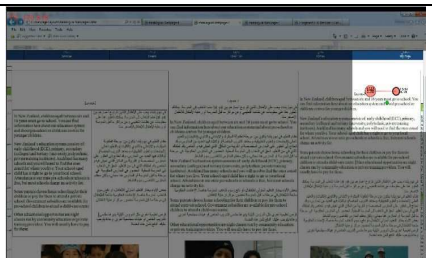


Table 12 shows that Participant 12 spent more time reading Layout 3 (paragraph by paragraph English on top)on webpages 1 & 2 compared with the time spent on reading Layout 2 (Arabic on the right and English on the left) on webpage-3.

Table 12 Participant 12 Video Results

Webpage-1 (Total = 2:27 Minutes)	**Webpage-2 (Total = 2:05 Minutes)**	**Webpage-3 (Total = 2:20 Minutes)**
Area of Interest-1 (AOI-1) P 12 started looking at Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen and he started reading the English text first, and he took 2:27 minutes.	**AOI-1** P 12 started looking at the 3 layouts on webpage-2 for 13 seconds, and then he started reading Layout 3 (paragraph by paragraph English on top) positioned on the right hand corner of the screen, and he started reading the English text first. P 12 took 1:52 minutes on reading Layout 3 (paragraph by paragraph by English on top).	**AOI-1** P 12 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen. P 12 started reading the English text first; and it took him 1: 10 minutes. P 12 started reading the Arabic translation next. Of Layout 2 (Arabic on the right and English on the left). P 12 took 2:20 minutes reading Layout 2 (Arabic on the right and English on the left).
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**

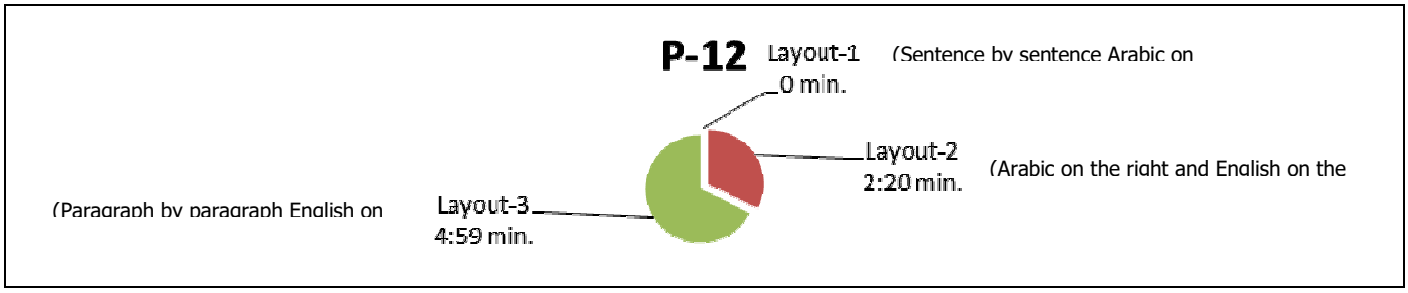
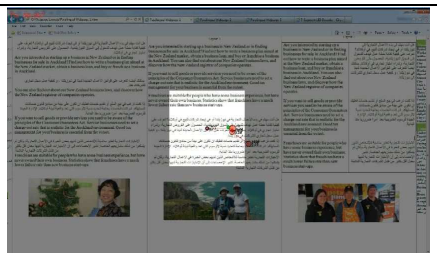
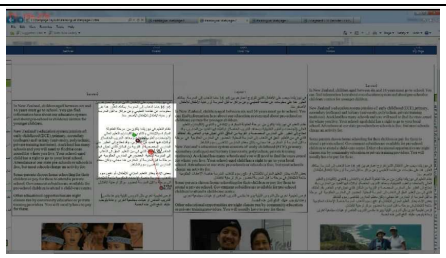
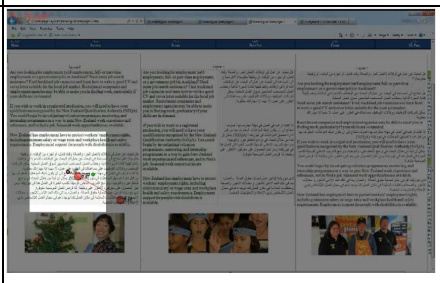


Table 13 shows that Participant 13 spent more time on reading Layout 3 (paragraph by paragraph English on top)on webpages 1 & 3 compared to the time spent on reading Layout 2 (Arabic on the right and English on the left) on webpage-2.

Table 13 Participant 13 Video Results

Webpage-1 (Total = 2:07 Minutes)	**Webpage-2 (Total = 3:23 Minutes)**	**Webpage-3 (Total = 3:53 Minutes)**
Area of Interest-1 (AOI-1) P 13 started reading Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen and he started reading the Arabic translation first, and he took 57 seconds. Then P 13 started reading the English text, and he took 1:10 minutes.	**AOI-1** P 13 started reading Layout 2 (Arabic on the right and English on the left), he started reading the Arabic translation first, and took him 1:11 minutes. P 13 read the English text next, and it took him 2:12 minutes.	**AOI-1** P 13 started reading Layout 3 (paragraph by paragraph English on top) positioned on the left corner of the screen, and he started reading the English text, and it took him 2:00 minutes. Then, P 13 started reading the Arabic translation; and it took him 1 minute. Then, P 13 went back to read the English text of Layout 3 (paragraph by paragraph by English on top), and it took him 53 seconds.
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**

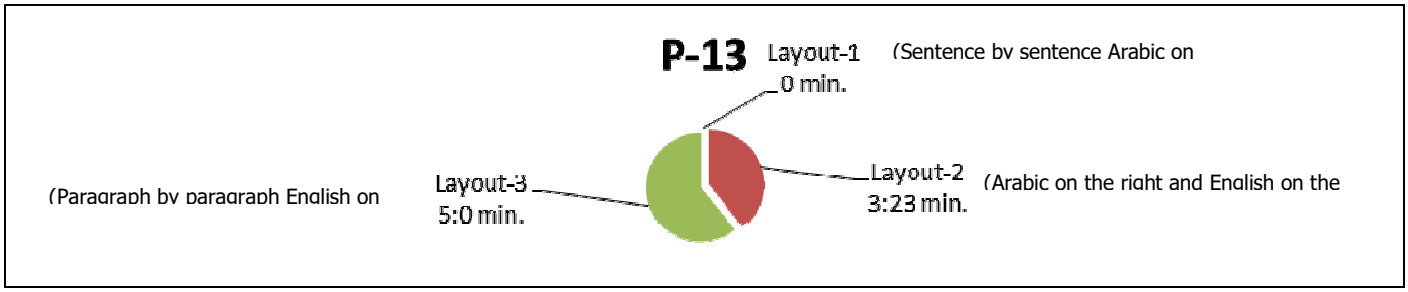
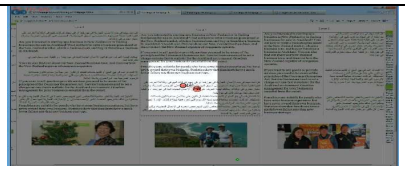
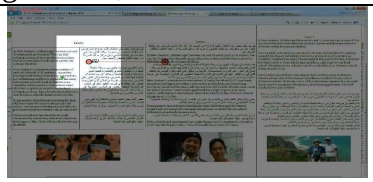
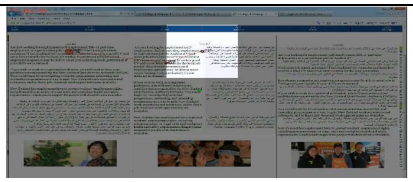


Table 14 shows that Participant 14 spent more time reading Layout 2 (Arabic on the right and English on the left) on webpages 2 & 3 compared with the time spent on reading Layout 3 (paragraph by paragraph English on top)on webpage-1.

Table 14 Participant 14 Video Results

Webpage-1 (Total = 3:00 Minutes)	**Webpage-2 (Total = 6:00 Minutes)**	**Webpage-3 (Total = 1:10 Minutes)**
Area of Interest-1 (AOI-1) P 14 started looking at all three layouts. **AOI-2** P 14 started reading Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen, and she started reading the English text first it took her 1:40 minutes. The P 14 started reading the Arabic translation, and it took her 1:20 minutes.	**AOI-1** P 14 started looking at all three layouts. **AOI-2** P 14 started reading through Layout 3 (paragraph by paragraph English on top) positioned on the right hand corner of the screen, the English text first; it took her 1:10 minutes. **AOI-3** P 14 changed her AOI to Layout 2 (Arabic on the right and English on the left) starting with the Arabic translation first, and it took her 2:50 minutes. Then P 14 started reading the English text, it took her 2 minutes.	**AOI-1** P 14 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and she started reading the Arabic translation, and it took her 1:10 minutes, then the English text.
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**

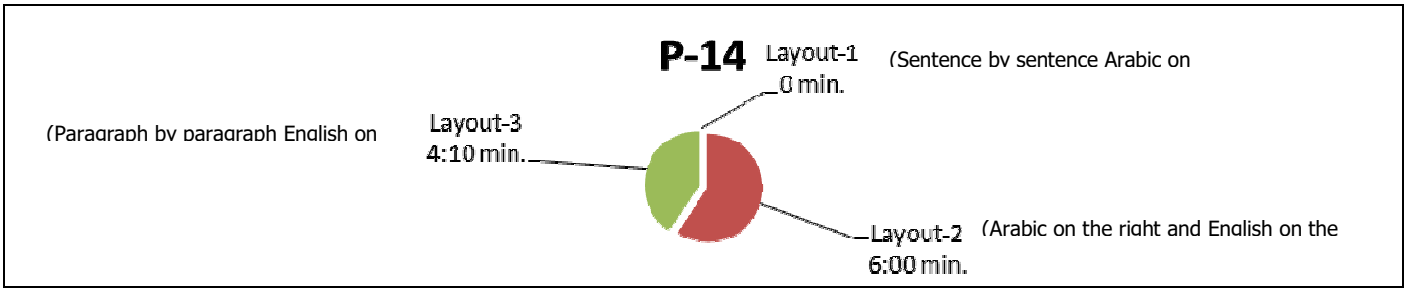


Table 15 shows that Participant 15 spent more time reading Layout 2 (Arabic on the right and English on the left) on all of the three webpages. He has a right glass eye, and the eye tracker camera recorded very unique video of the participant's eyes movements.

Table 15 Participant 15 Video Results

Webpage-1 (Total = 4:49 Minutes)	**Webpage-2 (Total = 4:00 Minutes)**	**Webpage-3 (Total = 3:00 Minutes)**
Area of Interest-1 (AOI-1) P 15 started reading Layout 2 (Arabic on the right and English on the left) positioned in the right hand side of the screen; he started reading the English text. While P 15 was reading Layout 2 (Arabic on the right and English on the left) he seemed as if he was looking at Layout 3 (paragraph by paragraph English on top)positioned in the middle of the screen captured by the eye tracking camera on the viewer, because he has a glass right eye. So when he was looking on the right he was using his left eye to read, but the eye tracker camera reflected the gaze from glass right eye looking further left, because the mouse was pointing to the English text of Layout 2 (Arabic on the right and English on the left) where P 15 was reading. P 15 spent 4:49 minutes on reading Layout 2 (Arabic on the right and English on the left).	**AOI-1** P 15 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text. The eye tracker's camera captured P 15 looking normally at Layout 2 (Arabic on the right and English on the left), because this time the mouse tracking was matching the highlighted eye tracking square. P 15 took 3 minutes to read the English text of Layout 2 (Arabic on the right and English on the left). P 15 took 1 minute to read the Arabic translation. P 15 spent 4 minutes on reading Layout 2 (Arabic on the right and English on the left).	**AOI-1** P 15 started reading Layout 2 (Arabic on the right and English on the left) positioned on the middle of the screen, and he started reading the Arabic translation, and it took him 3 minutes. While P 15 was reading through Layout 2 (Arabic on the right and English on the left) positioned on the right hand corner of the screen the eye tracker was a little off with the mouse tracker.

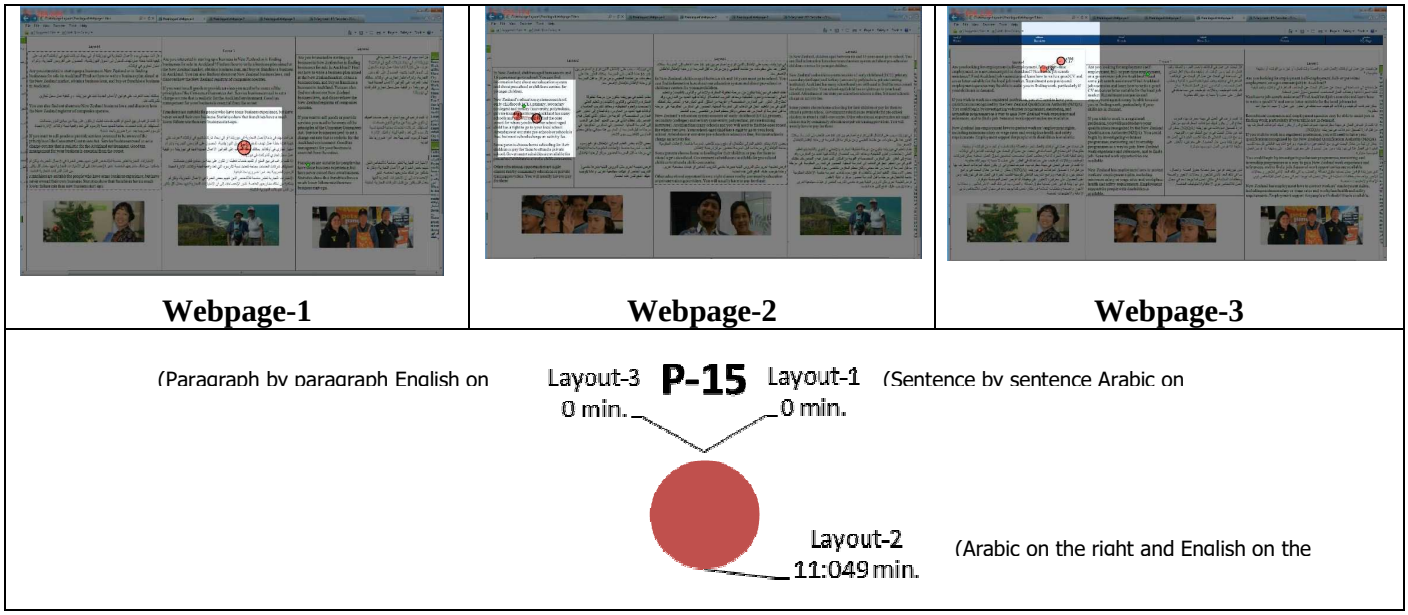
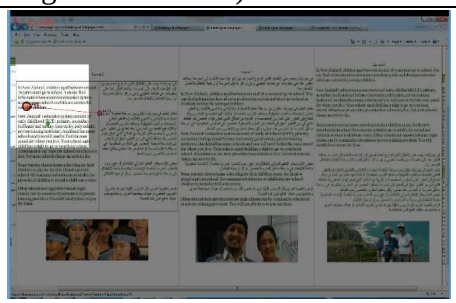
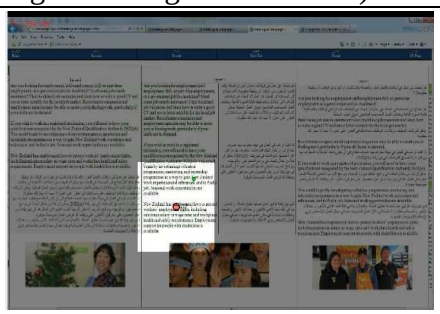


Table 16 shows that Participant 16 spent 3:27 minutes on reading Layout 3 (paragraph by paragraph English on top)on webpage-1, compared with 3:20 minutes that he spent on reading Layout 2 (Arabic on the right and English on the left) on webpages 2 & 3.

Table 16 Participant 16 Video Results

Webpage-1 (Total = 3:27 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 1:20 Minutes)**
Area of Interest-1 (AOI-1) P 16 started reading Layout 3 (paragraph by paragraph English on top) positioned in middle of the screen, he started reading the English text, and it took him 2:27 minutes. P 16 started reading the Arabic translation, it took him 1 minute.	**AOI-1** P 16 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text. P 16 spent 2 minutes on reading Layout 2 (Arabic on the right and English on the left).	**AOI-1** P 16 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and he started reading the English text. P 16 spent 1:20 minutes on reading Layout 2 (Arabic on the right and English on the left).
		
Webpage-1	**Webpage-2**	**Webpage-3**

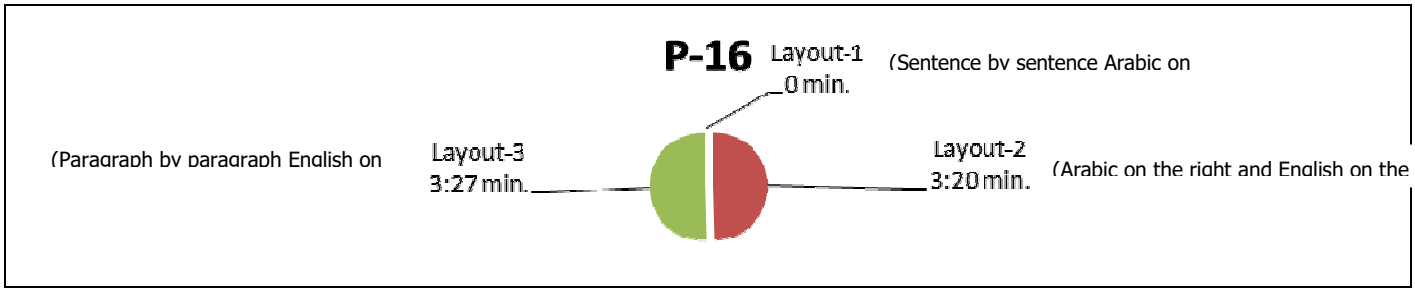
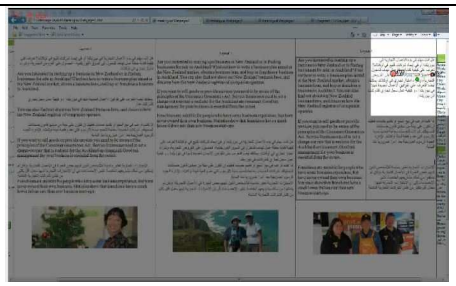
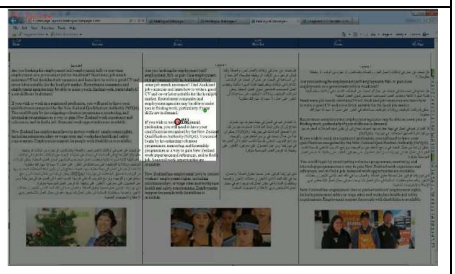


Table 17 shows that Participant 17 spent more time reading Layout 2 (Arabic on the right and English on the left) on all of the webpages.

Table 17 Participant 17 Video Results

Webpage-1 (Total = 3:00 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 1:51 Minutes)**
Area of Interest-1 (AOI-1) P 17 started reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand side of the screen, he started reading the Arabic translation, and it took him 1 minute. P 17 started reading The English text, it took him 2 minutes.	**AOI-1** P 17 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text, and it took him 1 minute. Then P 17 started reading through the Arabic translation of Layout 2 (Arabic on the right and English on the left), and it took him 1 minute.	**AOI-1** P 17 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and he started reading the English text, and it took him 1:51 minutes. Then P 17 started reading the Arabic translation, it took him 1 minute.
		
Webpage-1	**Webpage-2**	**Webpage-3**

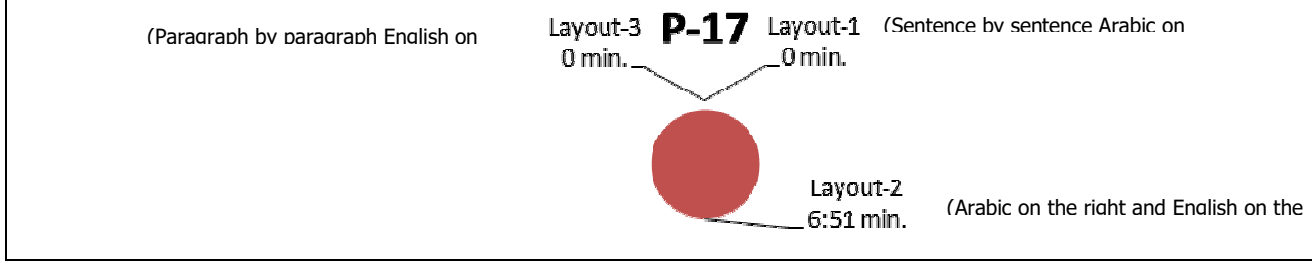


Table 18 shows that Participant 18 spent 2:35 minutes on reading Layout 2 (Arabic on the right and English on the left) on webpages 1 & 2 than 2:25 minutes spent on reading Layout 3 (paragraph by paragraph English on top)on webpages 1 & 3.

Table 18 Participant 18 Video Results

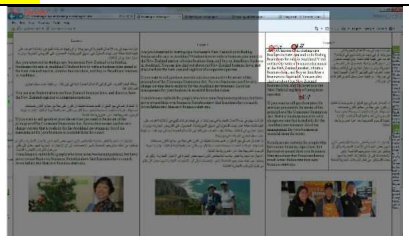
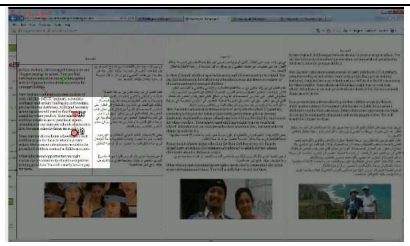
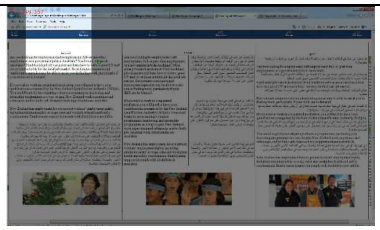
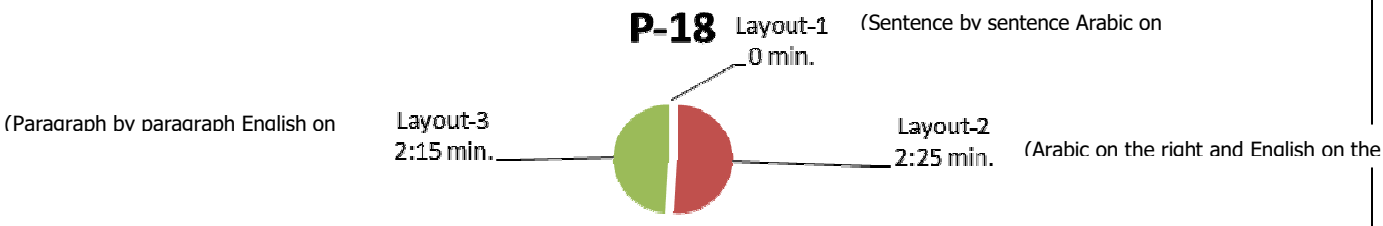
Webpage-1 (Total = 1:25 Minutes)	**Webpage-2 (Total = 1:10 Minutes)**	**Webpage-3 (Total = 2:15 Minutes)**
Area of Interest-1 (AOI-1) P 18 started reading Layout 3 (paragraph by paragraph English on top) positioned in middle of the screen, he started reading the English text, and it took him 10 seconds. **AOI-2** P 18 started reading The English text of Layout 2 (Arabic on the right and English on the left), it took him 1:25 minutes. P 18 looked up the translation of English words in Arabic, three times.	**AOI-1** P 18 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text, and it took him 1:10 minutes.	**AOI-1** P 18 started reading Layout 3 (paragraph by paragraph English on top) positioned on the left hand corner of the screen, and he started reading the English text, and it took him 2:15 minutes. Then P 18 looked up the translation of English words in Arabic.
		
Webpage-1	**Webpage-2**	**Webpage-3**
		

Table 19 shows that Participant 19 spent more time on reading Layout 2 (Arabic on the right and English on the left) on all of the webpages.

Table 19 Participant 19 Video Results

Webpage-1 (Total = 1:56 Minutes)	**Webpage-2 (Total = 4:10 Minutes)**	**Webpage-3 (Total = 2:00 Minutes)**
Area of Interest-1 (AOI-1) P 19 started reading Layout 2	**AOI-1** P 19 started reading Layout 2	**AOI-1** P 19 started reading Layout 2

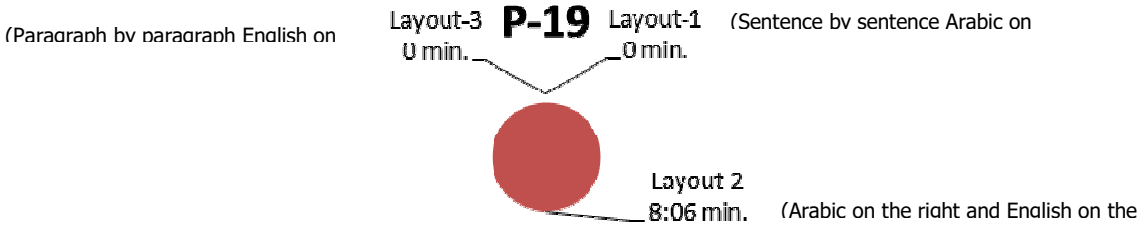
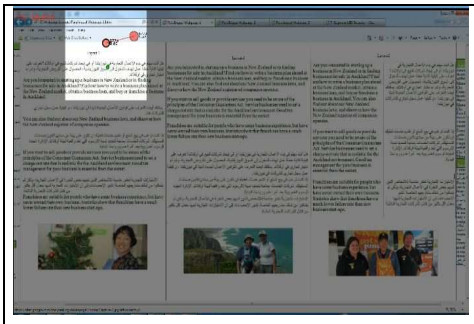
(Arabic on the right and English on the left) positioned on the right hand corner of the screen, she started reading the English text, and it took her 1:56 minutes. P 19 looked up the translation of English words in Arabic, four times.	(Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the Arabic translation first and then she was reading across the English text. P 19 spent 4:10 minutes on reading Layout 2 (Arabic on the right and English on the left). P 19 looked up the translation of English words in Arabic, three times.	(Arabic on the right and English on the left) positioned in the middle of the screen, and she started reading the Arabic translation, and it took her 2:00 minutes. Then P 19 looked up the translation of English words in Arabic two times.
		
Webpage-1	**Webpage-2**	**Webpage-3**
		

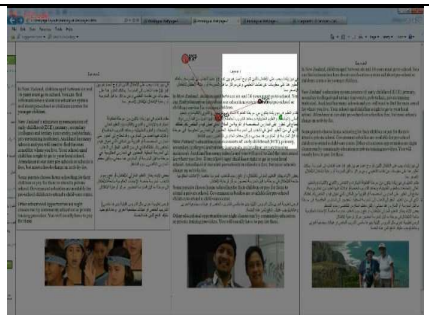
Table 20 shows that Participant 20 spent more time on reading Layout 1 (sentence by sentence Arabic on top) on all of the three webpage.

Table 20 Participant 20 Video Results

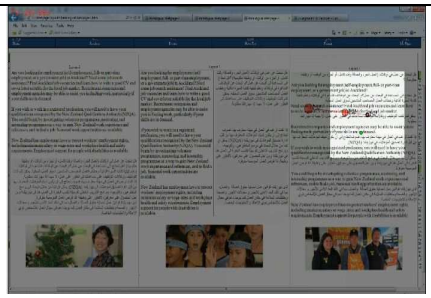
Webpage-1 (Total = 1:56 Minutes)	**Webpage-2 (Total = 1:45 Minutes)**	**Webpage-3 (Total = 1:40 Minutes)**
Area of Interest-1 (AOI-1) P 20 started reading Layout 1 positioned on the left hand side corner of the screen, she started reading the Arabic translation, and it took her 1:56 minutes.	**AOI-1** P 20 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen, and she started reading the Arabic translation first and then she was reading the English text beneath it and spent 1:45 minutes.	**AOI-1** P 20 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and she started reading the Arabic translation, and it took her 1:40 minutes.



Webpage-1



Webpage-2



Webpage-3

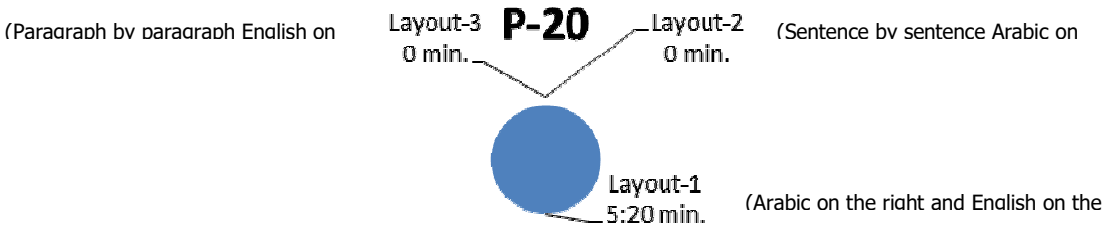


Table 21 shows that Participant 21 spent more time on reading Layout 1 (sentence by sentence Arabic on top) on webpage-1 & 3 than Layout 2 (Arabic on the right and English on the left) on webpage-2.

Table 21 Participant 21 Video Results

Webpage-1 (Total = 1:30 Minutes)	**Webpage-2 (Total = 2:30 Minutes)**	**Webpage-3 (Total = 1:20 Minutes)**
Area of Interest-1 (AOI-1) P 21 started reading Layout 1 positioned on the left hand side corner of the screen, she started reading the Arabic translation, and it took her 1:30 minutes.	**AOI-1** P 21 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and she started reading the English text first and then she was reading the English text next to it, and it took her 1:53 minutes. **AOI-2** P 21 changed her AOI to Layout 1 (sentence by sentence Arabic on top), and took her 37 seconds.	**AOI-1** P 21 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and she started reading the Arabic translation, and it took her 1:20 minutes.

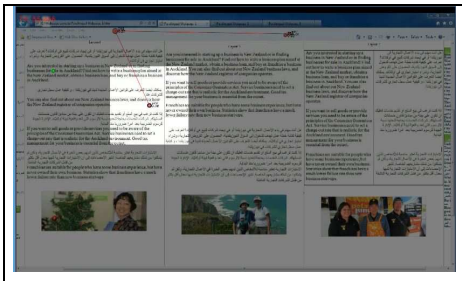
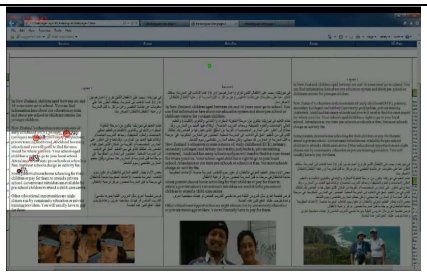
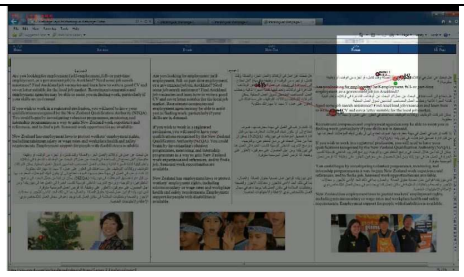
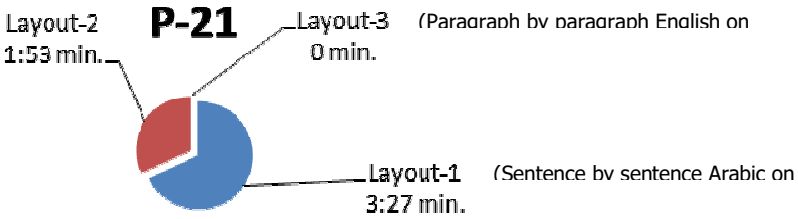
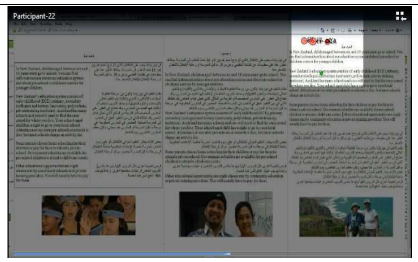
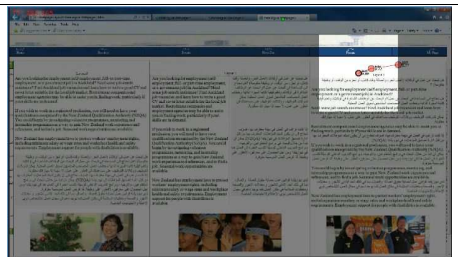
		
Webpage-1	**Webpage-2**	**Webpage-3**
(Arabic on the right and English on the		(Paragraph by paragraph English on (Sentence by sentence Arabic on

Table 22 shows that Participant 22 spent a total of 4:37 minutes reading Layout 3 (paragraph by paragraph English on top)on the three webpages, compared with a total of 2:49 minutes spent on reading Layout 1 (sentence by sentence Arabic on top) on webpages 1 & 3.

Table 22 Participant 22 Video Results

Webpage-1 (Total = 3:25 Minutes)	**Webpage-2 (Total = 1:57 Minutes)**	**Webpage-3 (Total = 2:04 Minutes)**
Area of Interest-1 (AOI-1) P 22 started reading Layout 1 positioned on the left hand side corner of the screen, he started reading the Arabic translation, and it took him 1:45 minutes. **AOI-2** P 22 changed his AOI to reading Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen; it took him 1:40 minutes.	**AOI-1** P 22 started reading Layout 3 (paragraph by paragraph English on top) positioned on the right hand corner of the screen, and he started reading the English text first and then he was reading the English text beneath it, and it took him 1:57 minutes.	**AOI-1** P 22 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and he started reading the Arabic translation, and it took him 1:04 minutes. **AOI-2** P 22 changed his AOI to Layout 3 (paragraph by paragraph by English on top), and it took him 1 minute.
		
Webpage-1	**Webpage-2**	**Webpage-3**

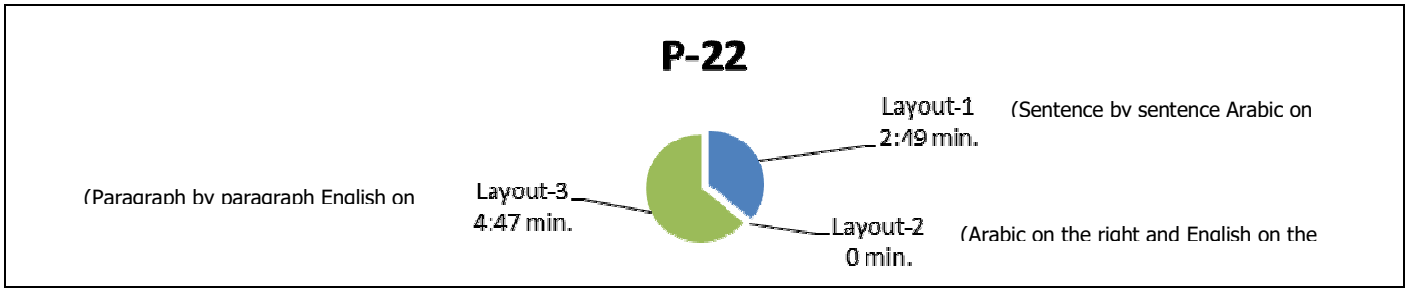
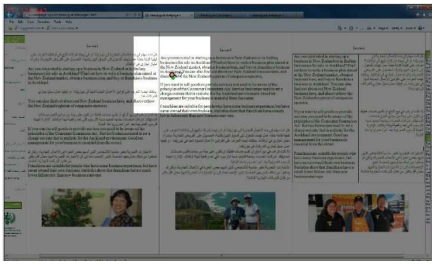
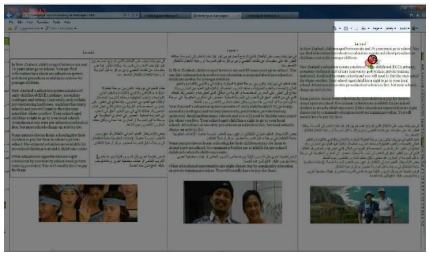
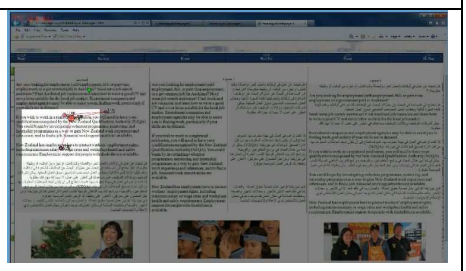


Table 23 shows that Participant 23 spent more time on reading Layout 3 (paragraph by paragraph English on top) on all of the webpages.

Table 23 Participant 23 Video Results

Webpage-1 (Total = 4:35 Minutes)	Webpage-2 (Total = 2:20 Minutes)	Webpage-3 (Total = 3:20 Minutes)
Area of Interest-1 (AOI-1) P 23 started reading Layout 1 positioned on the left hand side corner of the screen, he started reading the Arabic translation, and it took him 1:25 minutes. **AOI-2** P 23 changed his AOI to reading Layout 3 (paragraph by paragraph English on top) positioned in the middle of the screen; it took him 3:10 minutes.	**AOI-1** P 23 started reading Layout 3 (paragraph by paragraph English on top) positioned on the right hand corner of the screen, and he started reading the English text first and then he was reading the Arabic translation beneath it, and it took him 2:20 minutes.	**AOI-1** P 23 started reading Layout 3 (paragraph by paragraph English on top) positioned on the left hand side of the screen, and he started reading the English text, and it took him 3:20 minutes.
		
Webpage-1	**Webpage-2**	**Webpage-3**

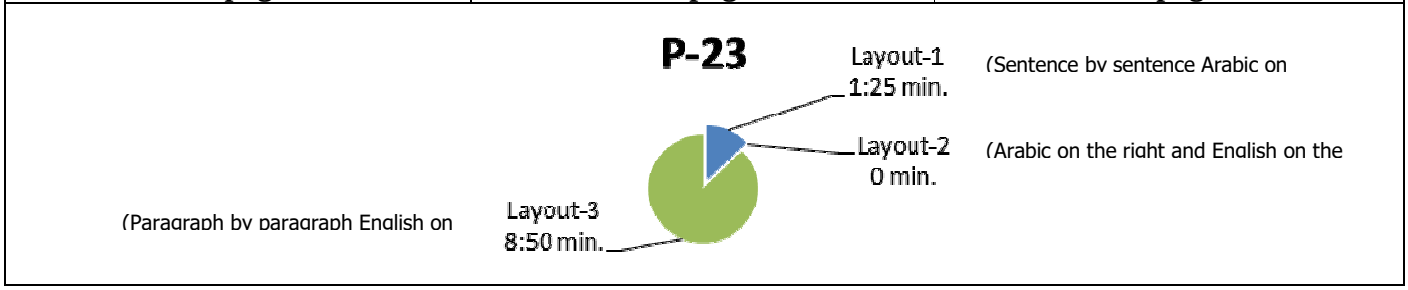
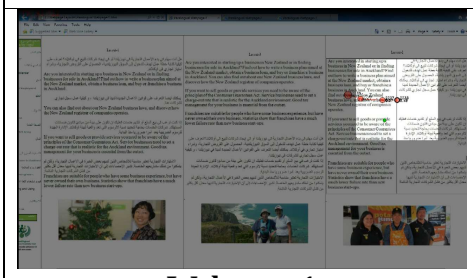
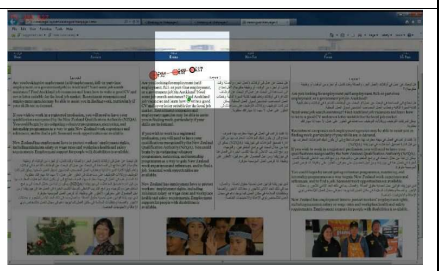
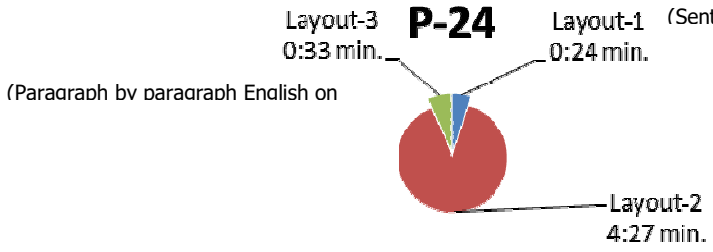


Table 24 shows that Participant 24 spent more time on reading Layout 2 (Arabic on the right and English on the left) on all of the three webpages.

Table 24 Participant 24 Video Results

Webpage-1 (Total = 1:44 Minutes)	Webpage-2 (Total = 1:25 Minutes)	Webpage-3 (Total = 2:10 Minutes)
Area of Interest-1 (AOI-1) P 24 started reading Layout 1 positioned on the left hand side corner of the screen, he started reading the Arabic translation, and it took him 24 seconds. **AOI-2** P 24 changed his AOI to reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand side of the screen; started reading the English text, and it took him 1:20 minutes. P 24 looked up translation of English words in Arabic two times.	**AOI-1** P 24 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand side corner of the screen, and he started reading the English text first, and it took him 1:25. P 24 looked up translation of English words in Arabic one time.	**AOI-1** P 24 started reading Layout 3 (paragraph by paragraph English on top) positioned on the left hand side of the screen, and he started reading the English text, and it took him 33 seconds. **AOI-2** P 24 changed his AOI to Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, he started reading the English text, and it took him 1:37 minutes. P 24 looked up translation of English words in Arabic three times.
 **Webpage-1**	 **Webpage-2**	 **Webpage-3**
		

Appendix K The Eye Tracking Experiment Results

Appendix L Research Information Sheet (English)

Localization Provision: Arabic Speakers' Preference for different paralingual Webpage Layout

Hello, my name is Fouad Shiblaq; I am a PhD student in the School of Computing & Mathematical Science at The University of Waikato (Hamilton).

I would like to invite you to participate in the research I am conducting, which called "Localization Provision in New Zealand: Arabic Speakers' Preference between six different paralingual Webpage layouts".

The research is designed to test participants' (Arabic Speakers) preference on paralingual webpage layout among three different layouts, and you need to select your preferred one.

The experiment consists of using an eye-tracking technique in order to record the eyes gaze on the preferred layout on a webpage, followed by a short interview.

The date for conducting this experiment has not been commenced, though there is possibility for this event to take place in March 2013. However the exact date has not been proclaimed yet.

Your participation will be highly appreciated, because it will help e-government's websites developers to gain insights on Arabic Speakers' preference on paralingual webpage layout.

If you have any questions in regards to the project, please feel free to contact any of the followings:

1. Fouad Shiblaq (Researcher); Phone: 443 3577; Email: shib@vodafone.co.nz
2. Professor Mark Apperley (Chief Supervisor); Phone: 838 4466 ext. 4528; Email: m.apperley@cs.waikato.ac.nz
3. Dr. Te Taka Keegan (Associate Supervisor); Phone 838 4466 ext. 4420; Email: tetaka@waikato.ac.nz

Research Information Sheet (Arabic)

توفير خدمة محلية في نيوزلندا: إختيار تصميم نموذجي للترجمة من بين ستة تصاميم على صفحة الويب للمتحدثين بالعربية

مرحباً، إسمي فؤاد شبلاق أعمل للحصول على شهادة الدكتوراه من جامعة وايكاتو في هاملتون قسم علوم الكمبيوتر و الرياضيات.

أود دعوتك للمشاركة في بحثي العلمي تحت عنوان:

توفير خدمة محلية في نيوزلندا: إختيار تصميم نموذجي للترجمة من بين عدة تصاميم على صفحة الويب للمتحدثين بالعربية

الهدف من هذا البحث هو التعرف على أفضل تصميم يفضله المتحدثين بالعربية عند تصفح صفحة للويب تحتوي على ترجمة باللغتين العربية و الإنجليزية، وذلك بإختيار التصميم المفضل من بين التصاميم الستة الموجودة في الشكل-1 على صفحة-2.

للتمكن من تسجيل حركة العين للمشارك خلال إختيار التصميم المفضل سوف يتم إستخدام تقنية تتبع العين وهي عبارة عن كاميرا تثبت على جهاز الحاسوب؛ كما يثبت جهاز تتبع يحتوي على ضوء لتتمكن الكاميرا من رصده و تسجيله.

لم يتم تحديد موعد إجراء تجربة إستخدام تقنية تتبع العين حتى الأن ، ولكن من المتوقع أن تكون في شهر مارس 2012.

أود أن أحثك علي المشاركة، لأن مشاركتك تعتبر محل تقدير حيث أنها سوف تساهم في إختيار التصميم الأفضل، مما سيساعد القائمين على تصاميم صفحات الويب المترجمة، لإختيار التصميم المفضل للمتحدثين باللغة العربية.

الرجاء الإتصال بأحد الأشخاص التالية أسمائهم إذا كان لديك أية إستفسارات بخصوص هذا البحث:

1. فؤاد شبلاق (باحث)؛ نلفون:094433577 البريد الإلكتروني: shib@clear.net.nz
2. بروفسور مارك إبلي (المشرف الرئيس على البحث)؛ تليفون: 8384466 تحويله: 4528 البريد الإلكتروني: m.apperley@waikato.ac.nz
3. دكتور تي تاكا كيجان (المشرف المساعد على البحث)؛ تليفون: 8384466 تحويله: 4420؛ البريد الإلكتروني: tetaka@waikato.ac.nz

Appendix M Consent Form (English)

Localization Provision in New Zealand: Arabic Speakers preference between six Para-lingual Webpage Layouts

I have read the information sheet that was given to me, and I understand what this research is about. The researcher (Fouad Shiblaq) has explained to me that I will remain anonymous at all times, and that this research does not expose me to any emotional or physical harm.

I can withdraw at any time prior to the completion of this research. It was explained to me that the interview would be taped and transcribed.

I understand that I will be offered to read the executive summary of the final research report.

Researcher Name: Fouad Shiblaq;

shib@clear.net.nz

Research Chief Supervisor: Professor Mark Apperley;

mapperle@waikato.ac.nz

Research Associate Supervisor: Dr. Te Taka Keegan;

tetaka@waikato.ac.nz

I give my consent to participate in this research;

Participant

Name……...

Signature…….Date……

……

Consent Form (Arabic)

Localisation Provision in New Zealand: Arabic Speakers' Preference between six Para-lingual Webpage Layouts
توفير خدمة محلية في نيوزلندا: إختيار تصميم نموذجي للترجمة من بين ستة تصاميم على صفحة الويب للمتكلمين بالعربية

أقر أنا الموقع أدناه أنني إستلمت و قرأت وثيقة المعلومات بخصوص هذا البحث وأنني أدرك كينونة هذا البحث.

لقد أوضح لي السيد فؤاد شبلاق بأن بياناتي الشخصية ستبقى سرية ولن يتم ذكرها على الإطلاق في البحث وبأنني لن أتعرض لأية أضرار نفسية أو جسدية.

وأنه بإمكاني الإنسحاب في أي وقت من هذا البحث قبل إتمامه و أنني على علم بأن المقابلة الشخصية سوف يتم تسجيلها و كتابتها.

كما أنه تم إخطاري بأنني سوف أطلع على الملخص التنفيذي لهذا البحث.

Research Chief Supervisor: Professor. Mark Apperley **mapperle@waikato.ac.nz**

Research Associate Supervisor: Dr. Te Taka Keegan **tetaka@waikato.ac.nz**

I give my consent to participate in this research;

Participant's

Signature…….Date……..

Appendix N The Interview Questions

Date: **Participant #:** **Time:**

Q 1 Gender

○ Male ○ Female

Q 2 Legal Status & Ethnicity:

○ Immigrant ○ Refugee ○ International Student ○ Others

Q 3 Age?

○18-23 ○ 24-29 ○ 30-35 ○ 36-39 ○ 40 and up

Q 4 What is your English proficiency? What is your educational backgrounds?

○ Excellent ○ Good ○ Fair ○ Poor

Q 5 How long have you lived in New Zealand?

Q 6 Do you have Internet at home?

○ Yes ○ No

If not? ○ Social & economic barriers ○ Others

Q 7 What language do you usually use when browsing the Internet?

☐ Arabic ☐ English ☐ Other

Q 8 How many years have you been using the Internet?

Q 9 What do you use the Internet for?

☐ Email ☐ Internet browsing ☐ Communicating with family members overseas ☐ News ☐ Maps direction ☐ Tickets reservation ☐ Legal information & issues ☐ Employment ☐ Entertainment such as music & movies ☐ Education ☐ Internet banking

Q 10 What sort of information do you look for on the Internet?

Q 11 Do you usually look for information online using e-government?

(Examples: use of IT by government agencies like IRD, MIA, etc.)

○ Yes ○ No **How often?** ○ Once a week ○ More than once a week ○ Infrequently ○ Never

Why not? ☐ Lack of technical & Internet knowledge ☐ Inadequate English language ☐ Unaware of the information available on e-government

Q 12 Which layout do you prefer? Why? Which one would you go for second choice?

○ Layout 1 (sentence by sentence Arabic on top): Line by line Arabic on top Layout 2 (Arabic on the right and English on the left) (Arabic on the right and English on the left) (Arabic on the right and English on the left): Arabic on right, English on left

○ Layout 3 (paragraph by paragraph by English on top) (paragraph by paragraph English on top)(paragraph by paragraph by English on top): The whole text English on top Second Choice

Q 13 If paralingual websites are available, are you more likely to change how often you browse e-government? Why? How paralingual websites would benefit you?

○ Yes ○ No

Q 14 Have you participated in the online survey designed for this research?
○Yes ○No
Q 15 If you answered Yes to Q 14, have you selected the same choice in this experiment too?
○Yes ○No ○ I do not recall ○Not Applicable
Q 16 What are the reasons would you say that discourages you from accessing e-government? □Unaware of the information available □The English language barrier
Q 17 What are the benefits of paralingual websites?
□ Employment search □ Access e-government more often □Creates trust in the government □ Could be used as an educational tool □ Provides newcomers with important information □Saves time when looking for important information □ Others

Appendix O Participants' Interview Results Presented in Tables

Table 1 shows the interview results of Participant 1.

Table 1 Participant 1 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	Work Permit	36-39	Doctor	Excellent	7 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	15 Years	Email ---------- Internet Browsing ---------- Communicating with family members overseas News ---------- Maps direction ---------- Ticket Reservation ---------- - Legal Information ---------- - Employment ---------- Entertainment ---------- Education ---------- Internet Banking	Yes Infrequently	N/A
Paralingual Webpage Layouts					

1st Choice	2nd Choice	Likely to change in E-government	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on top)	None	No	I use the English language all the time.	No	Employment search --- Access e-government more often --- Creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 1:

1. Demographics: P 1 is a male; he is on a work permit; age is within 36-39; educational background is medical doctor; he has been living in New Zealand for seven years.

2. Internet Usage: P 1 has an Internet at home; he uses Arabic and English languages to browse the Internet; he is been using the Internet for fifteen years; he uses the Internet for Email, Internet Browsing, Communicating with family members overseas, News, Maps direction, Ticket Reservation, Legal Information,

Employment, Entertainment, Education, Internet Banking; He infrequently uses E-government.

3. Paralingual Webpage Layouts: Layout 1 (paragraph by paragraph English on top) was the most preferred layout as 1st choice for P 1, and he did not have a 2nd choice; P 1 would not change his usage of E-government, if paralingual websites were available, he uses the English language all of the time; P 1 did not participate in the online websurvey that was conducted using Facebook on the Internet the results are available in chapter four; P 1 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, Saves time when looking for important information.

Table 2 shows the interview results of Participant 2.

Table 2 Participant 2 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	24-29	Master Degree	Excellent	1 Month
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	10 Years	Email ---------- Internet Browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Legal Information ----------	Yes Infrequently	N/A

			Employment ---------- Education ---------- Internet Banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right and English on the left)	Layout 3 (paragraph by paragraph English on top))	No	The English is easier to use.	No	Employment search ---------- Access e-government more often ---------- Provides newcomers with important information ---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 2:

1. Demographics: P 2 is a male; international student; age is within 24-29; educational background is a master degree; his English language proficiency is excellent; he has been living in New Zealand for one months.

2. Internet Usage: P 2 has an Internet at home; he uses Arabic and English languages to browse the Internet; he is been using the Internet for ten years; he uses the Internet for: Email, Internet Browsing, Communicating with family members overseas , News, Maps direction, Legal Information, Employment, Education, Internet Banking; He infrequently uses E-government.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 2, and his second choice was

Layout 3 (paragraph by paragraph English on top); P 2 would not change his usage of E-government, if paralingual websites were available, English is easier for him; P 2 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 2 selected these benefits of paralingual websites: Employment search, Access e-government more often, Provides newcomers with important information, and Saves time when looking for important information

Table 3 shows the interview results of Participant 3.

Table 3 Participant 3 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language School	Fair	4 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	6 Years	Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Legal information & issues ---------- Education ---------- Internet banking	Yes the Arabic ones, such as the consulate of my country.	Unaware of the information available in English ---------- The English language barrier

Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on top))	Layout 1 (sentence by sentence Arabic on top)	Yes	Paralingual websites would help in looking up the translation of difficult words.	No	Employment search --- Access e-government more often --- Creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 3:

1. Demographics: P 3 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for four months.

2. Internet Usage: P 3 has an Internet at home; he uses Arabic and English languages to browse the Internet; he is been using the Internet for more than six years; he uses the Internet for Internet browsing, Communicating with family members overseas, News, Maps direction, Legal information & issues, Education, and Internet banking; He uses the Arabic E-government to update his status with the consulate of his

country; the reason for not using English E-government in New Zealand for example for the Immigration is being unaware of the information available due to the English language barrier.

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top)was the most preferred layout as 1st choice for P 3, and his second choice was Layout 1 (sentence by sentence Arabic on top); P 3 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 3 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 3 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 4 shows the interview results of Participant 4

Table 4 Participant 4 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language School	Good	3.5 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	7 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction	No	Inadequate English language and Unaware of the information available on e-government

			---------- Legal information & issues ---------- Education ---------- - Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence Arabic on top)	None	Yes	Paralingual websites would help in looking up the translation of difficult words.	No	Employment search ---------- Access e-government more often ---------- - Creates trust in the government ---------- Could be used as an educational tool ---------- - Provides newcomers with important information Saves time when looking for important information

The followings are summaries of interview results of Participant 4:

1. Demographics: P 4 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for three and half months.

2. Internet Usage: P 4 has an Internet at home; he uses Arabic and English languages to browse the Internet; he is been using the Internet for seven years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Legal information & issues, Education, and Internet banking; He does not use E-government; the reason for not using English E-government due to inadequate English language, and unaware of the information available.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence Arabic on top) was the most preferred layout as 1st choice for P 4, and no second choice; P 4 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 4 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 4 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 5 shows the interview results of Participant 5.

Table 5 Participant 5 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language School	Good	1.5 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	6 Years	Email Internet browsing ----------	Yes Arabic E-government Once a	Unaware of the information available and

			Communicating with family members overseas --- News --- Legal information & issues --- Entertainment such as music & movies --- Education	week	the English language barrier.
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right and English on the left)	Layout 1 (sentence by sentence Arabic on top)	Yes	Paralingual websites would help in looking up the translation of difficult words.	No	Employment search --- Creates trust in the government --- Could be used as an educational tool --- Saves time when looking for important information.

The followings are summaries of interview results of Participant 5:

1. Demographics: P 5 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for one and half months.

2. Internet Usage: P 5 has an Internet at home; he uses Arabic and English languages to browse the Internet; he is been using the Internet for six years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Legal information & issues, Entertainment such as music & movies, and Education; He does not use E-government in English; the reason for not using English E-government due to inadequate English language, and unaware of the information available.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 5, and Layout 1 (sentence by sentence Arabic on top) as second choice; P 5 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 5 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 5 selected these benefits of paralingual websites: Employment search, Creates trust in the government, Could be used as an educational tool, and Saves time when looking for important information.

Table 6 shows the interview results of Participant 6.

Table 6 Participant 6 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language School	Fair	4 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic	12 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas	No	Unaware of the information available.

			---------- News ---------- Tickets reservation ---------- Entertainment such as music & movies ---------- Education Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence Arabic on top)	None	Yes	Paralingual websites would help in looking up the translation of difficult words.	No	Creates trust in the government ---------- Could be used as an educational tool ---------- Saves time when looking for important information.

The followings are summaries of interview results of Participant 6:

1. Demographics: P 6 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for four months.

2. Internet Usage: P 6 has an Internet at home; he uses the Arabic language to browse the Internet; he is been using the Internet for twelve years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Tickets reservation, Entertainment such as music & movies, and Education; He does

not use E-government in English; the reason for not using English E-government due to inadequate English language, and unaware of the information available.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence Arabic on top) was the most preferred layout as 1st choice for P 6, and no second choice; P 6 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 6 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 6 selected these benefits of paralingual websites: Creates trust in the government, Could be used as an educational tool, and Saves time when looking for important information.

Table 7 shows the interview results of Participant 7.

Table 7 Participant 7 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School and English Language School	Good	3 Weeks
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	English	10 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Tickets	Yes Infrequently	N/A

			reservation --- Legal information & issues --- Employment --- Entertainment such as music & movies --- Education --- Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence Arabic on top)	Layout 2 (Arabic on the right and English on the left)	Yes	Paralingual websites would help in looking up the translation of difficult words.	No	Employment search --- Access e-government more often Creates trust in the government --- Could be used as an educational too --- l Provides newcomers with important information --- Saves time

					when looking for important information

The followings are summaries of interview results of Participant 7:

1. Demographics: P 7 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for three weeks.

2. Internet Usage: P 7 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for ten years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; He uses E-government infrequently.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence Arabic on top) was the most preferred layout as 1st choice for P 7, and his second choice was Layout 2 (Arabic on the right and English on the left) ; P 7 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 7 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 7 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 8 shows the interview results of Participant 8.

Table 8 Participant 8 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language	Fair	3 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government

Yes	Arabic & English	10 Years	Email --- Internet browsing --- Communicating with family members overseas --- News --- Maps direction --- Tickets reservation --- Legal information & issues --- Employment Entertainment such as music & movies --- Education --- Internet banking	No	The English language barrier
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence Arabic on top)	Layout 3 (paragraph by paragraph English on top)	Yes	Paralingual websites would help in looking up the translation of difficult words.	No	Employment Search --- Access e-government more often Creates trust in the government ---

					Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 8:

1. Demographics: P 8 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for three months.

2. Internet Usage: P 8 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for ten years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; He does not use E-government.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence Arabic on top) was the most preferred layout as 1st choice for P 8, and his second choice was Layout 3 (paragraph by paragraph English on top) ; P 8 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 8 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 8 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 9 shows the interview results of Participant 9.

Table 9 Participant 9 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language School	Fair	1 Month
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic	8 Years	Email --- Internet browsing --- Communicating with family members overseas --- Legal information & issues --- Employment Entertainment such as music & movies --- Education	Yes Infrequently	N/A
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on top)	Layout 2 (Arabic on the right and English on the	Yes	Paralingual websites would help in looking up the translation of difficult	No	Employment search --- Access e-government more often

	left)		words.		---------- Creates trust in the government ---------- Could be used as an educational tool ---------- Provides newcomers with important information ---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 9:

1. Demographics: P 9 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for one month.

2. Internet Usage: P 9 has an Internet at home; he uses the Arabic language to browse the Internet; he is been using the Internet for eight years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet; He uses E-government infrequently, but he still unaware of the information available on e-government

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top) was the most preferred layout as 1st choice for P 9, and his second choice was Layout 2 (Arabic on the right and English on the left); P 9 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 9 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 9 selected these benefits of paralingual websites:

Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 10 shows the interview results of Participant 10.

Table 10 Participant 10 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Students	24-29	High School & English Language School	Fair	1.5 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	English	10 Years	Email --- Internet browsing --- Communicating with family members overseas --- News --- Entertainment such as music & movies --- Education	Yes Infrequently	N/A
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right and English	Layout 3 (paragraph by paragraph English	Yes	Paralingual websites would help in looking up the translation of	No	Employment search --- Access e-government

on the left)	on top)		difficult words.		more often --- Creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 10:

1. Demographics: P 10 is a male; international student; age is within 24-29; educational background is high school and still studying at an English language school; he has been living in New Zealand for one year and a half.

2. Internet Usage: P 10 has an Internet at home; he uses the English language to browse the Internet; he is been using the Internet for ten years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Entertainment such as music & movies, and Education; He uses E-government infrequently.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 10, and his second choice was Layout 3 (paragraph by paragraph English on top); P 10 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to translate difficult words in English into Arabic; P 10 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 10 selected these benefits of paralingual websites:

Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 11 shows the interview results of Participant 11.

Table 11 Participant 11 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	High School & English Language School	Good	7 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	7 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- Maps direction ---------- Tickets reservation ---------- Entertainment such as music & movies ---------- Education ---------- Internet banking	No	Inadequate English language ---------- Unaware of the information available on e-government.
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-governmen	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites

		t Usage			
Layout 2 (Arabic on the right and English on the left)	Layout 1 (sentence by sentence Arabic on top)	Yes	Easy to read.	No	Employment search --- Access e-government more often --- Creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 11:

1. Demographics: P 11 is a male; international student; age is within 18-23; educational background is high school and still studying at an English language school; he has been living in New Zealand for seven months.

2. Internet Usage: P 11 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for seven years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, Maps direction, Tickets reservation, Entertainment such as music & movies, Education, and Internet banking; He does not use E-government.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 11, and his second choice was Layout 1 (sentence by sentence Arabic on top); P 11 would use E-government more often, if paralingual websites were available, the main reason for that is it would be

easier to read; P 11 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 11 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 12 shows the interview results of Participant 12.

Table 12 Participant 12 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	30-35	High School Degree studying at English Language School	Excellent	3 Weeks
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	17 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Tickets reservation ---------- Employment ----------	Yes Infrequently	N/A

			Entertainment such as music & movies --- Education --- Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on top)	Layout 2 (Arabic on the right and English on the left)	Yes	Easy to read	No	Employment search --- Access e-government more often --- Creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 12:

1. Demographics: P 12 is a male; international student; age is within 30-35; educational background is high school and still studying at an English language school; he has been living in New Zealand for three weeks.

2. Internet Usage: P 12 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for seventeen years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Employment, Entertainment such as music & movies, Education, and Internet banking; He uses E-government infrequently.

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top) was the most preferred layout as 1st choice for P 12, and his second choice was Layout 2 (Arabic on the right and English on the left); P 12 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 12 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 12 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 13 shows the interview results of Participant 13.

Table 13 Participant 13 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	30-35	High School & English Language School	Excellent	1 Month
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
No Using Internet on Mobile	Arabic & English	17 Years	Email ---------- Internet browsing	Yes Once a week.	N/A

Phone.			---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Tickets reservation ---------- Employment ---------- Entertainment such as music & movies ---------- Education ---------- Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on top)	Layout 2 (Arabic on the right and English on the left)	Yes	Easy to read.	No	Employment search ---------- Access e-government more often ---------- Creates trust in the government ---------- Could be used as an educational tool ----------

					Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 13:

1. Demographics: P 13 is a male; international student; age is within 30-35; educational background is high school and still studying at an English language school; he has been living in New Zealand for one month.

2. Internet Usage: P 13 Does not have an Internet at home, he uses his 3-G mobile phone for Internet access; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for seventeen years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Employment, Entertainment such as music & movies, Education, and Internet banking; he uses E-government once a week.

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top) was the most preferred layout as 1st choice for P 13, and his second choice was Layout 2 (Arabic on the right and English on the left); P 13 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 13 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 13 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 14 shows the interview results of Participant 14.

Table 14 Participant 14 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ

Female	Immigrant	40 and up	Master Degree Student	Excellent	7 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	14 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Tickets reservation ---------- Legal information & issues ---------- Employment ---------- Entertainment such as music & movies ---------- Education ---------- Internet banking	Yes Once a week	N/A
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph	Layout 2	N/A	Easy to read.	No	Employment search

by paragraph English on top)	(Arabic on the right and English on the left)				---------- Access e-government more often ---------- Creates trust in the government ---------- Could be used as an educational tool ---------- Provides newcomers with important information ---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 14:

1. Demographics: P 14 is a female; immigrant; age is 40 and up; educational background is studying master degree; she has been living in New Zealand for seven years.

2. Internet Usage: P 14 has an Internet at home; she uses the Arabic and English languages to browse the Internet; she is been using the Internet for fourteen years; she uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; she uses E-government once a week.

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top) was the most preferred layout as 1st choice for P 14, and her second choice was Layout 2 (Arabic on the right and English on the left); P 14 would not affect her use of E-government, if paralingual websites were available, but it would be easier to

read; P 14 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 14 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 15 shows the interview results of Participant 15.

Table 15 Participant 15 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	24-29	BS degree Student	Excellent	4 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	17 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Tickets reservation ---------- Legal information & issues ---------- Employment ----------	Yes Infrequently	N/A

			Entertainment such as music & movies ---------- Education ---------- Internet		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right and English on the left)	None	Yes	Easy to Read	No	Employment search ---------- Access e-government more often ---------- creates trust in the government ---------- Could be used as an educational tool ---------- Provides newcomers with important information ---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 15:

1. Demographics: P 15 is a male; international student; age is within 24-29; educational background is BS degree student; he has been living in New Zealand for four years.

2. Internet Usage: P 15 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for seventeen years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; he uses E-government infrequently.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 15, and he did not have a second choice; P 15 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 15 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 15 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 16 shows the interview results of Participant 16.

Table 16 Participant 16 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	24-29	BS Degree Student	Excellent	5 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	12 Years	Email ---------- Internet browsing ---------- Communicating with family	Yes Infrequently	The English language barrier

			members overseas --- News --- Maps direction --- Tickets reservation --- Legal information & issues --- Entertainment such as music & movies --- Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right and English on the left)	Layout 3 (paragraph by paragraph English on top)	Yes	Easy to read.	No	Employment search --- Access e-government more often --- creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important

					information ---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 16:

1. Demographics: P 16 is a male; international student; age is within 24-29; educational background is BS degree student; he has been living in New Zealand for five years.

2. Internet Usage: P 16 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for twelve years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Entertainment such as music & movies, and Internet banking; he uses E-government infrequently.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 16, and his second choice was Layout 3 (paragraph by paragraph English on top); P 16 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 16 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 16 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 17 shows the interview results of Participant 17.

Table 17 Participant 17 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	24-29	BS Degree Student	Excellent	4.5 Years

Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	12 Years	Email --- Internet browsing --- Communicating with family members overseas --- News --- Maps direction Tickets reservation --- Legal information & issues --- Employment --- Entertainment such as music & movies --- Education --- Internet banking	No	The English language barrier
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right	Layout 3 (paragraph by paragraph English on	Yes	Easy to read.	No	Employment search --- Access e-government

and English on the left)	top)				more often --- creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 17:

1. Demographics: P 17 is a male; international student; age is within 24-29; educational background is BS degree student; he has been living in New Zealand for four and a half years.

2. Internet Usage: P 17 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for twelve years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; he does not use E-government, due to the English language barrier.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 17, and his second choice was Layout 3 (paragraph by paragraph English on top); P 17 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 17 did not participate in the online websurvey that was conducted

using Facebook on the Internet, the results are available in chapter four; P 17 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 18 shows the interview results of Participant 18.

Table 18 Participant 18 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	40 and up	BS Electronic Engineering & Studying at the English School	Fair	8 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	10 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News Maps direction ---------- Internet banking	Yes Infrequently	Inadequate English language
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout	None	Yes	Easy to read.	No	Employment

2 (Arabic on the right and English on the left)					search --- Access e-government more often --- creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 18:

1. Demographics: P 18 is a male; international student; age is 40 and up; educational background is BS degree in Electronics and studying at an English language School; he has been living in New Zealand for eight months.

2. Internet Usage: P 18 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for ten years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, and Internet banking; he uses E-government infrequently, due to the English language barrier.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 18, and he did not have a second choice; P 18 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 18 did not

participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 18 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 19 shows the interview results of Participant 19.

Table 19 Participant 19 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Female	International Student	18-23	BS Degree And studying at an English Language School	Good	9 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	10 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Employment ---------- Entertainment such as music & movies ---------- Education	No	The English language barrier
Paralingual Webpage Layouts					

1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right and English on the left)	None	Yes	Easy to read	No	Employment search --- Access e-government more often --- creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 19:

1. Demographics: P 19 is a female; international student; age is within 18-23; educational background is BS degree in Electronics and studying at an English language School; she has been living in New Zealand for nine months.

2. Internet Usage: P 19 has an Internet at home; she uses the Arabic and English languages to browse the Internet; she is been using the Internet for ten years; she uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Employment, Entertainment such as music &

movies, and Internet banking; she does not use the E-government due to the English language barrier.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 19, and she did not have a second choice; P 19 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 19 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 19 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 20 shows the interview results of Participant 20.

Table 20 Participant 20 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Female	International Student	30-35	Master in Chemistry & studying at the English Language School	Good	8 Months
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	10 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ----------	Yes Infrequently	Inadequate English language

			Employment --- Entertainment such as music & movies --- Education		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence Arabic on top)	Layout 2 (Arabic on the right and English on the left)	Yes	Easy to read	No	Employment search --- Access e-government more often --- creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 20:

1. Demographics: P 20 is a female; international student; age is within 30-35; educational background is Master degree in Chemistry and studying at an English language School; she has been living in New Zealand for eight months.

2. Internet Usage: P 20 has an Internet at home; she uses the Arabic and English languages to browse the Internet; she is been using the Internet for ten years; she uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Employment, Entertainment such as music & movies, and Education; she uses E-government infrequently, due to the English language barrier.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence Arabic on top) was the most preferred layout as 1st choice for P 20, and Layout 2 (Arabic on the right and English on the left) was her second choice; P 20 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 20 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 20 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 21 shows the interview results of Participant 21.

Table 21 Participant 21 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Female	Immigrant	40 and up	Master in Mathematics	Excellent	16 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	16 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ----------	Yes Infrequently	Unaware of the information available on e-government

			News --- Maps direction --- Tickets reservation --- Legal information & issues --- Employment --- Entertainment such as music & movies --- Education --- Internet		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 1 (sentence by sentence Arabic on top)	Layout 2 (Arabic on the right and English on the left)	Yes	Easy to read	Yes She did not recall what her selection was in the online websurvey	Employment search --- Access e-government more often creates trust in the government --- Could be used as an educational tool --- Provides newcomers with important information

					---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 21:

1. Demographics: P 21 is a female; immigrant; age is 40 and up; educational background is Master degree in Mathematics; she has been living in New Zealand for sixteen years.

2. Internet Usage: P 21 has an Internet at home; she uses the Arabic and English languages to browse the Internet; she is been using the Internet for sixteen years, since she moved to New Zealand with her family; she uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; she uses E-government infrequently, because she was unaware of the information available on e-government.

3. Paralingual Webpage Layouts: Layout 1 (sentence by sentence Arabic on top) was the most preferred layout as 1st choice for P 21, and Layout 2 (Arabic on the right and English on the left) was her second choice; P 21 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 21 participated in the online websurvey that was conducted using Facebook on the Internet, but she did not recall what her selection was, the results are available in chapter four; P 21 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 22 shows the interview results of Participant 22.

Table 22 Participant 22 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	BS Degree student	Excellent	3.5 Years
Internet Usage					

Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	Arabic & English	8 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Tickets reservation ---------- Legal information & issues ---------- Employment ---------- Entertainment such as music & movies ---------- Education ---------- Internet banking	No	Unaware of the information available on e-government
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on	Layout 2 (Arabic on the right and English	Yes	Easy to read	Yes He selected Layout 3 (paragraph by	Employment search ---------- Access e-government

top)	on the left)			paragraph English on top) The same selection as the eye tracking experiment.	more often ---------- creates trust in the government ---------- Could be used as an educational tool ---------- Provides newcomers with important information ---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 22:

1. Demographics: P 22 is a male; international student; age is within 18-23; educational background is BS degree student; he has been living in New Zealand for three and a half years.

2. Internet Usage: P 22 has an Internet at home; he uses the Arabic and English languages to browse the Internet; he is been using the Internet for eight years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; he did not use E-government, because he was Unaware of the information available on e-government.

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top) was the most preferred layout as 1st choice for P 22, and Layout 2 (Arabic on the right and English on the left) was his second choice; P 22 would use E-government more often, if paralingual websites were available, the main reason for that is it would

be easier to read; P 22 participated in the online websurvey that was conducted using Facebook on the Internet, and his selection was the same as the selection he made in the eye tracking experiment, the results are available in chapter four; P 22 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 23 shows the interview results of Participant 23.

Table 23 Participant 23 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	BS Degree student	Excellent	2 Years
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	English	8 Years	Email ---------- Internet browsing ---------- Communicating with family members overseas ---------- News ---------- Maps direction ---------- Tickets reservation ---------- Legal information & issues ---------- Employment	Yes Infrequently	N/A

			---------- Entertainment such as music & movies ---------- Education ---------- Internet banking		
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 3 (paragraph by paragraph English on top)	Layout 2 (Arabic on the right and English on the left)	Yes	Easy to read	No	Employment search ---------- Access e-government more often ---------- creates trust in the government ---------- Could be used as an educational tool ---------- Provides newcomers with important information ---------- Saves time when looking for important information

The followings are summaries of interview results of Participant 23:

1. Demographics: P 23 is a male; international student; age is within 18-23; educational background is BS degree student; he has been living in New Zealand for two years.

2. Internet Usage: P 23 has an Internet at home; he uses the English languages to browse the Internet; he is been using the Internet for eight years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; he uses the E-government infrequently.

3. Paralingual Webpage Layouts: Layout 3 (paragraph by paragraph English on top) was the most preferred layout as 1st choice for P 23, and Layout 2 (Arabic on the right and English on the left) was his second choice; P 23 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 23 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 23 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Table 24 shows the interview results of Participant 24.

Table 24 Participant 24 Interview Results

Demographics					
Gender	Legal Status	Age	Education	English Proficiency	Time Lived in NZ
Male	International Student	18-23	BS Degree Student	Excellent	1 Year
Internet Usage					
Internet at Home	Browsing Language	Number of Years	For	E-government Usage	Reasons for not using E-government
Yes	English	8 Years	Email ---------- Internet browsing ----------	No	Unaware of the information available on e-

			Communicating with family members overseas --- News --- Maps direction --- Tickets reservation --- Legal information & issues --- Employment --- Entertainment such as music & movies --- Education --- Internet banking		government
Paralingual Webpage Layouts					
1st Choice	2nd Choice	Likely to change in E-government Usage	Uses of Paralingual websites	Participation in Online Websurvey	Benefits of Paralingual Websites
Layout 2 (Arabic on the right and English on the left)	Layout 3 (paragraph by paragraph English on top)	Yes	Easy to read	No	Employment search --- Access e-government more often --- creates trust in the government --- Could be used as an educational

					tool --- Provides newcomers with important information --- Saves time when looking for important information

The followings are summaries of interview results of Participant 24:

1. Demographics: P 24 is a male; international student; age is within 18-23; educational background is BS degree student; he has been living in New Zealand for one years.

2. Internet Usage: P 24 has an Internet at home; he uses the English languages to browse the Internet; he is been using the Internet for eight years; he uses the Internet for: Email, Internet browsing, Communicating with family members overseas, News, Maps direction, Tickets reservation, Legal information & issues, Employment, Entertainment such as music & movies, Education, and Internet banking; he uses the E-government infrequently.

3. Paralingual Webpage Layouts: Layout 2 (Arabic on the right and English on the left) was the most preferred layout as 1st choice for P 24, and Layout 3 (paragraph by paragraph English on top) was his second choice; P 24 would use E-government more often, if paralingual websites were available, the main reason for that is it would be easier to read; P 24 did not participate in the online websurvey that was conducted using Facebook on the Internet, the results are available in chapter four; P 24 selected these benefits of paralingual websites: Employment search, Access e-government more often, Creates trust in the government, Could be used as an educational tool, Provides newcomers with important information, and Saves time when looking for important information.

Appendix P The Participants' Interview Themes presented in Diagrams and their Analysis

The interview themes of Participant 1 are shown in Figure 1.

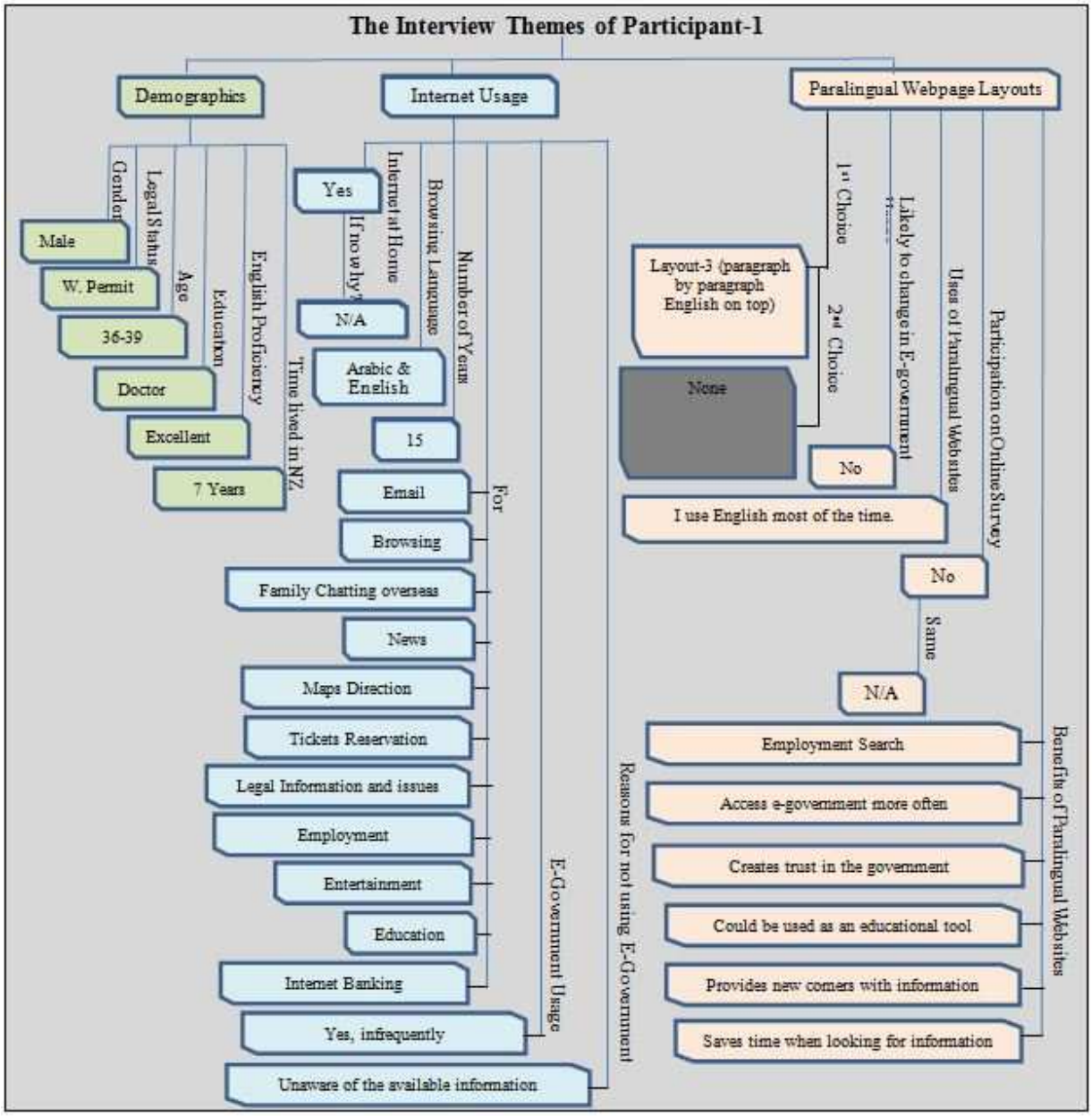


Figure 1 The Interview Themes of Participant 1

The interview themes of Participant 2 are shown in Figure 2.

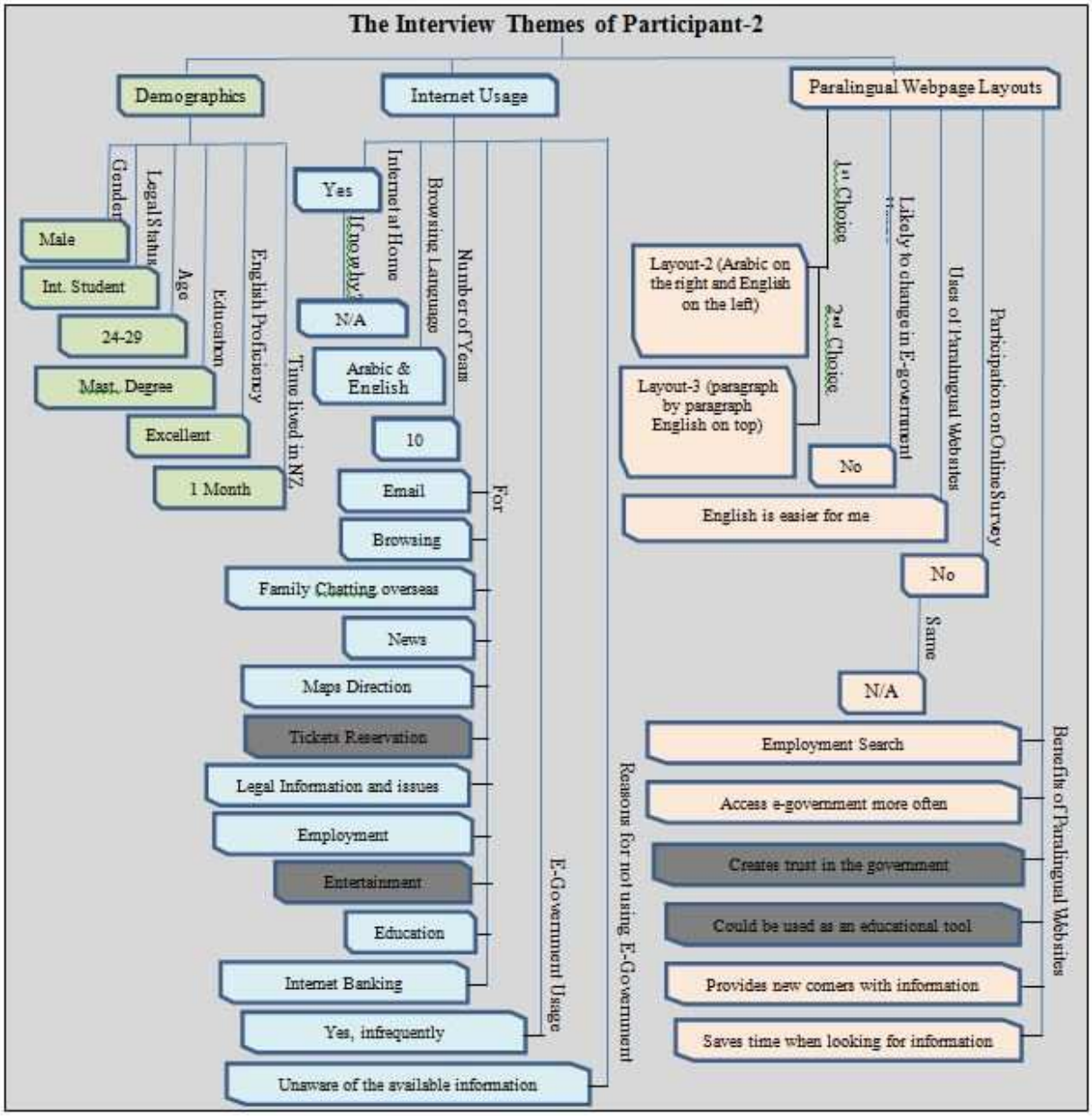


Figure 2 The Interview Themes of Participant 2

The interview themes of Participant 3 are shown in Figure 3.

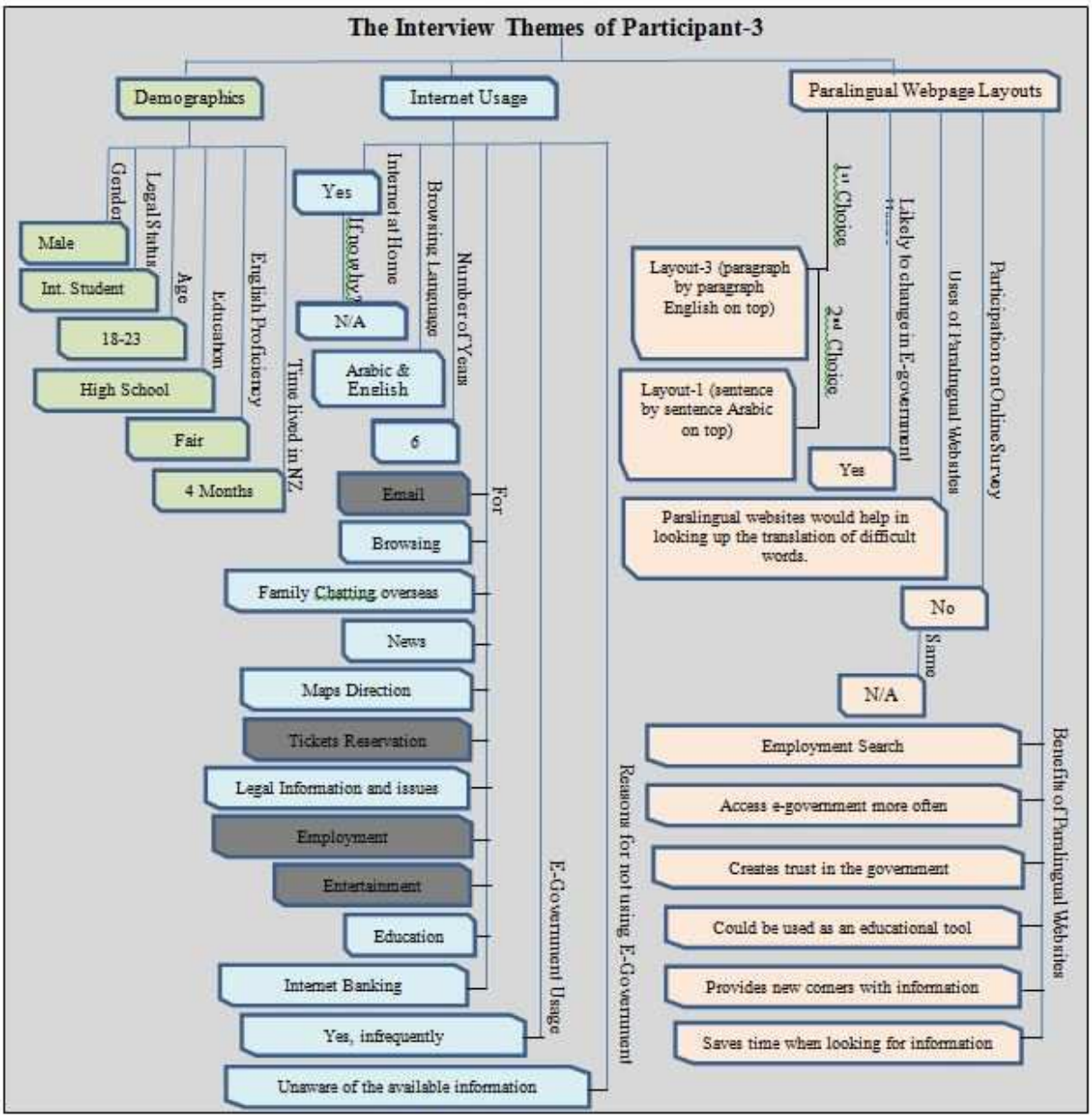


Figure 3 The Interview Themes of Participant 3

The interview themes of Participant 4 are shown in Figure 4.

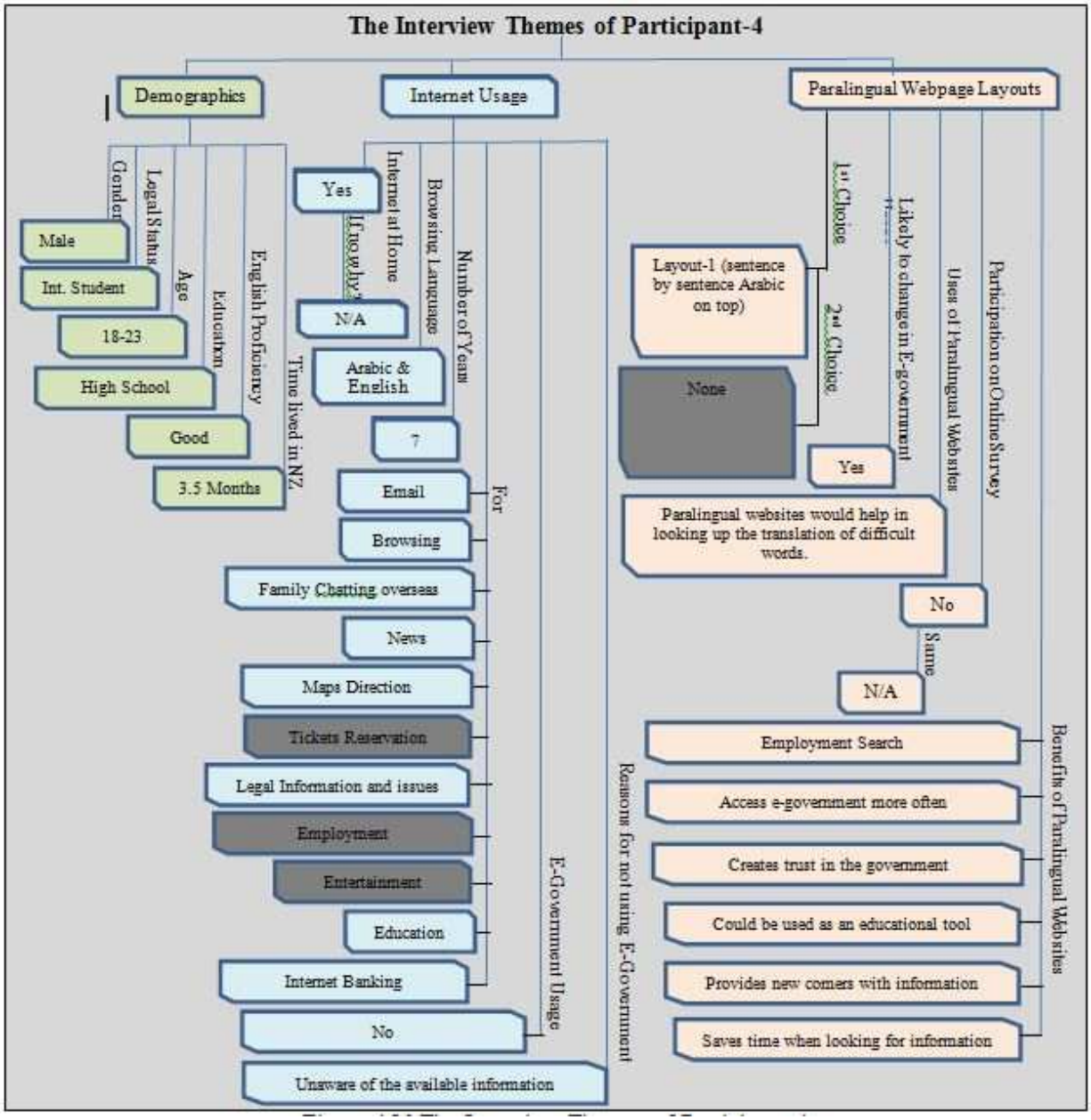


Figure 4 The Interview Themes of Participant 4

The interview themes of Participant 5 are shown in Figure 5.

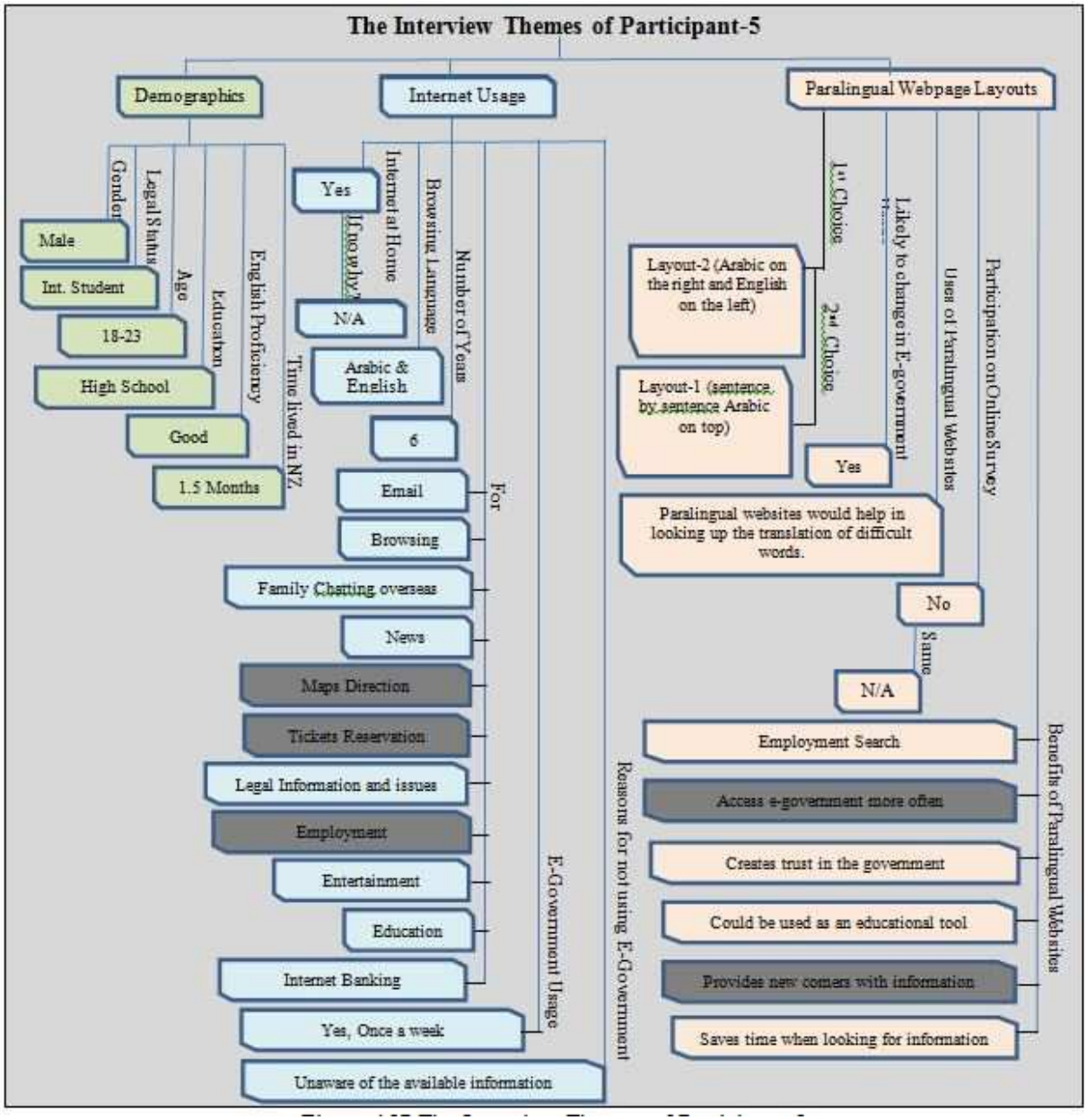


Figure 5 The Interview Themes of Participant 5

The interview themes of Participant 6 are shown in Figure 6.

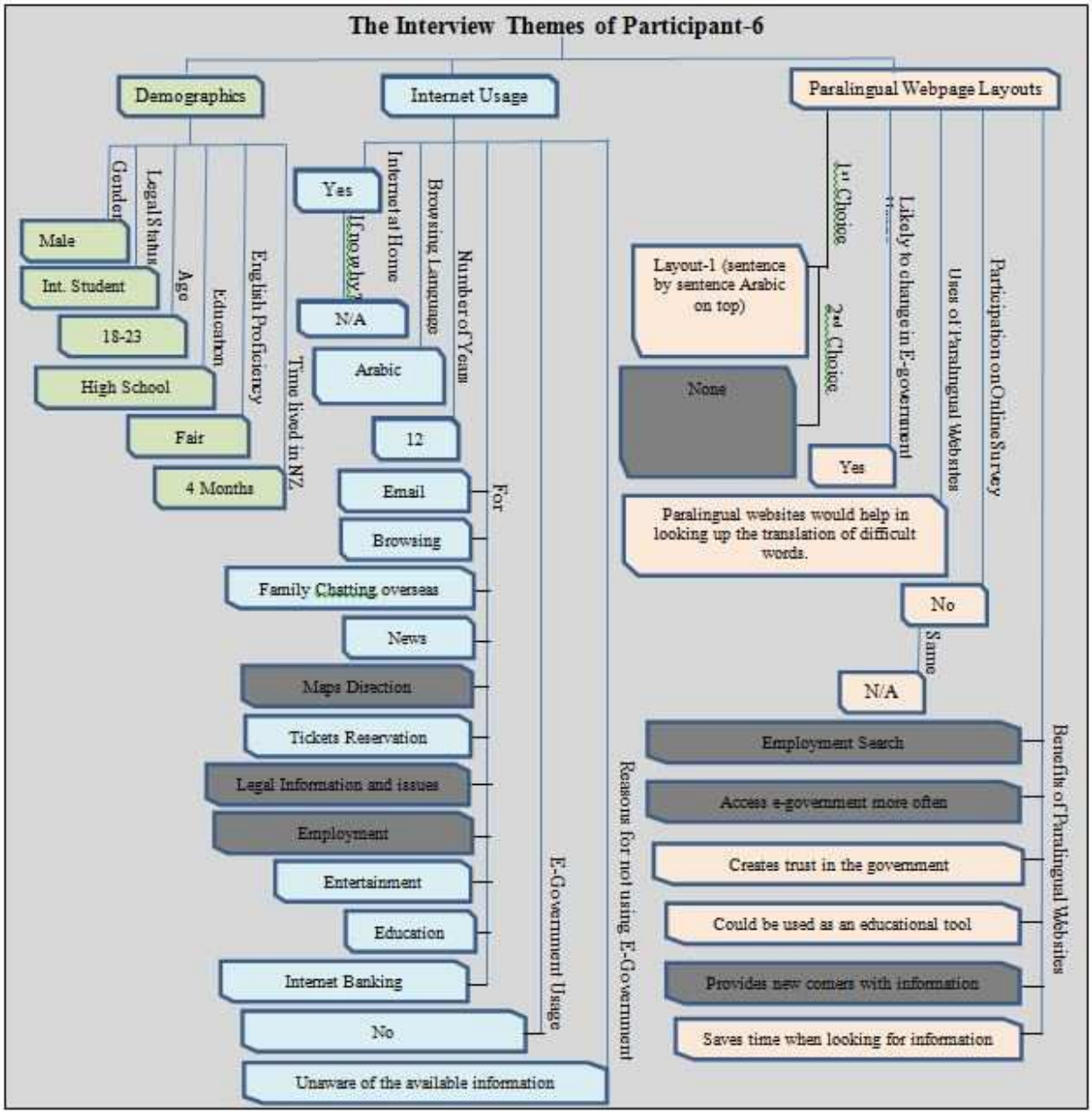


Figure 6 The Interview Themes of Participant 6

The interview themes of Participant 7 are shown in Figure 7.

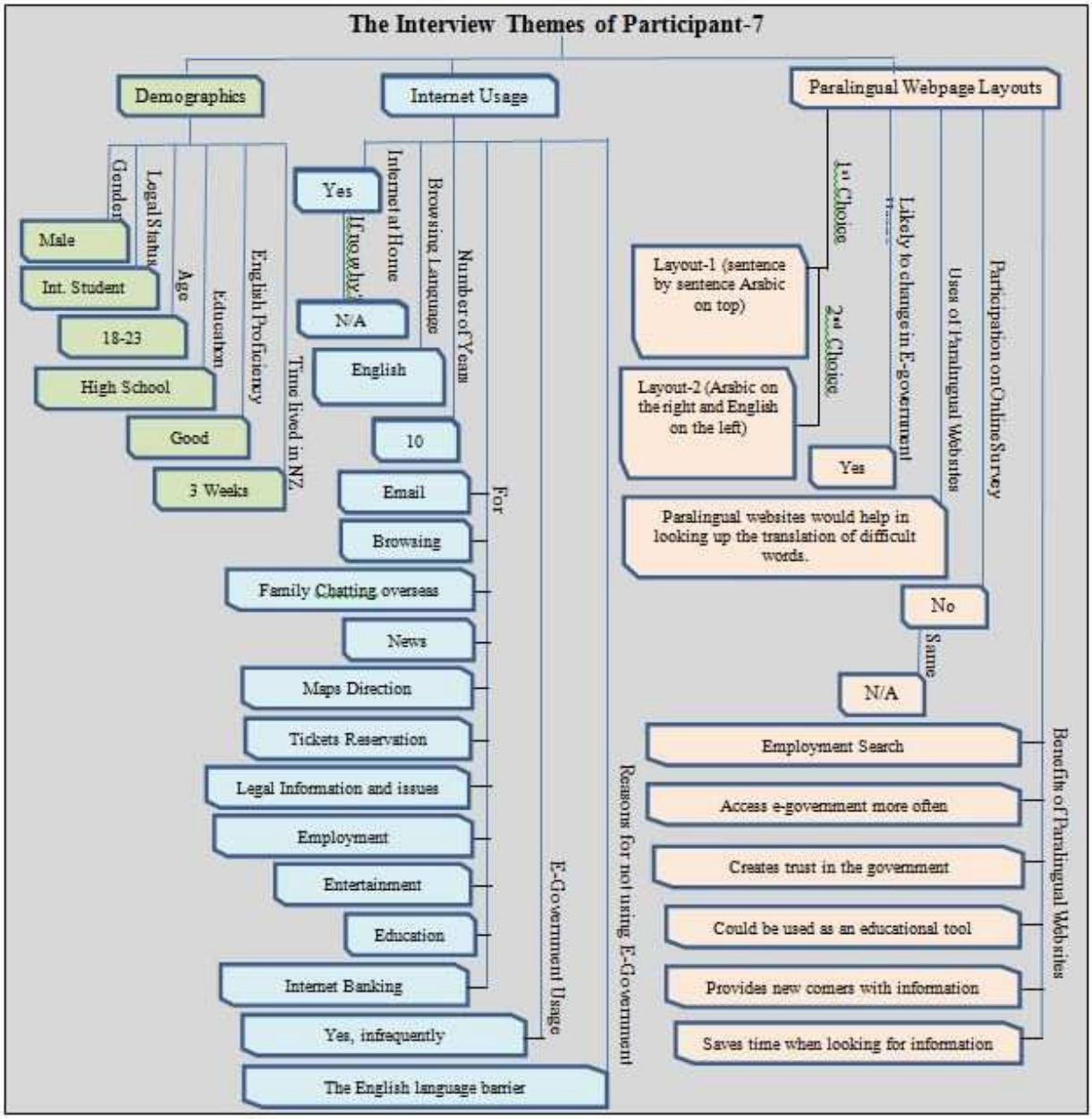


Figure 7 The interview themes of Participant 7

The interview themes of Participant 8 are shown in Figure 8.

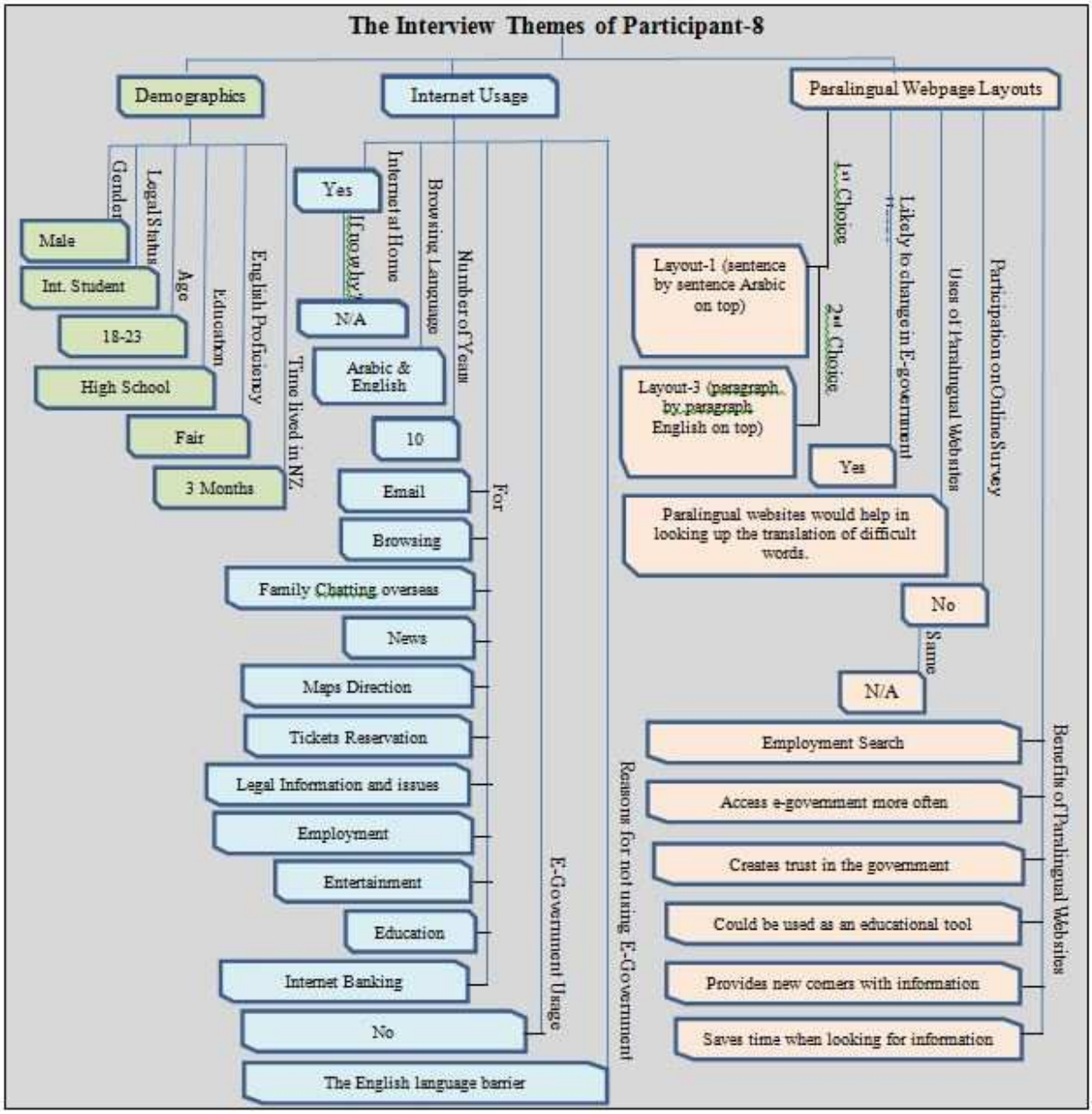


Figure 8 The Interview Themes of Participant 8.

The interview themes of Participant 9 are shown in Figure 9.

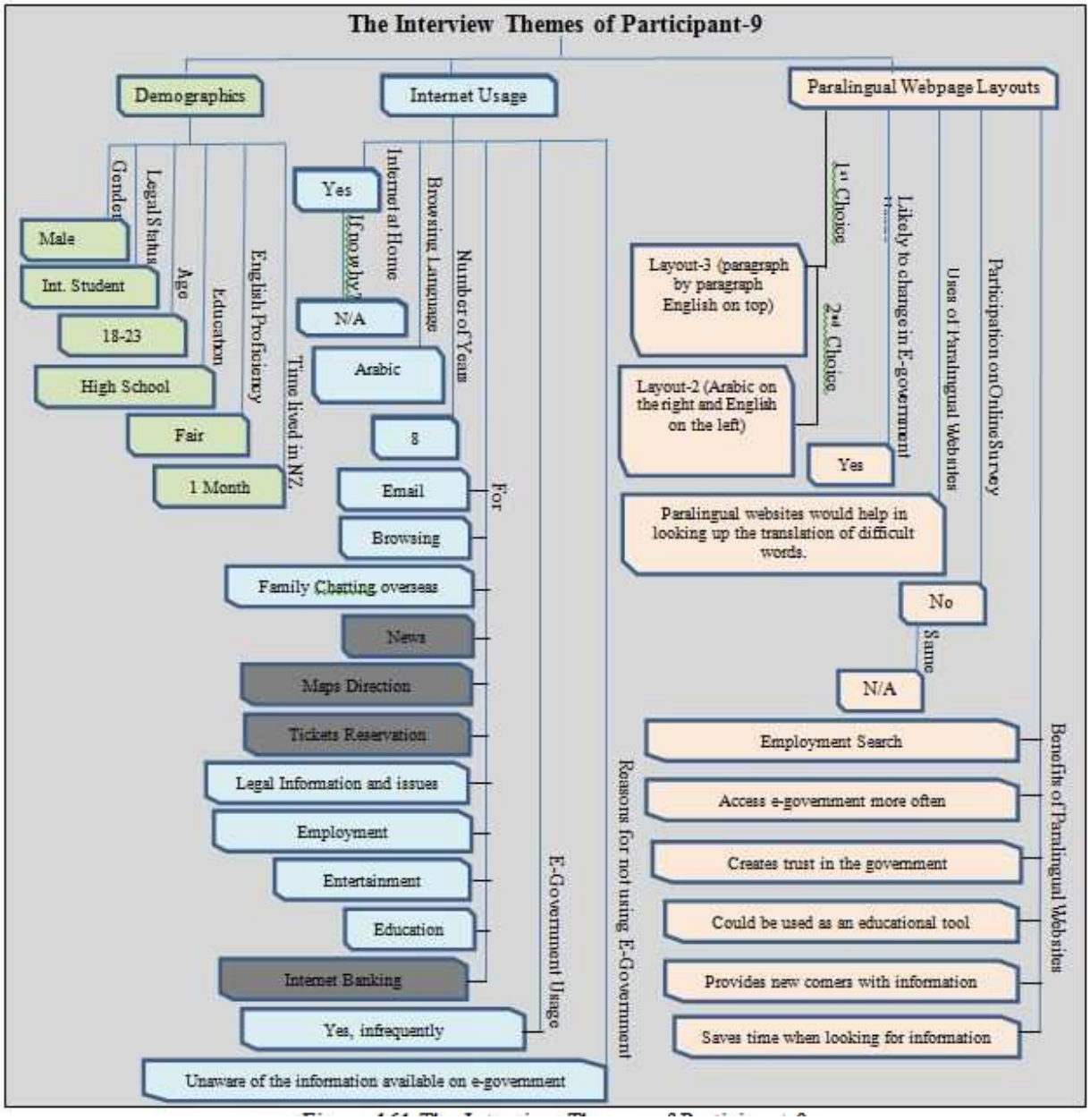


Figure 9 The Interview Themes of Participant 9.

The interview themes of Participant 10 are shown in Figure 10.

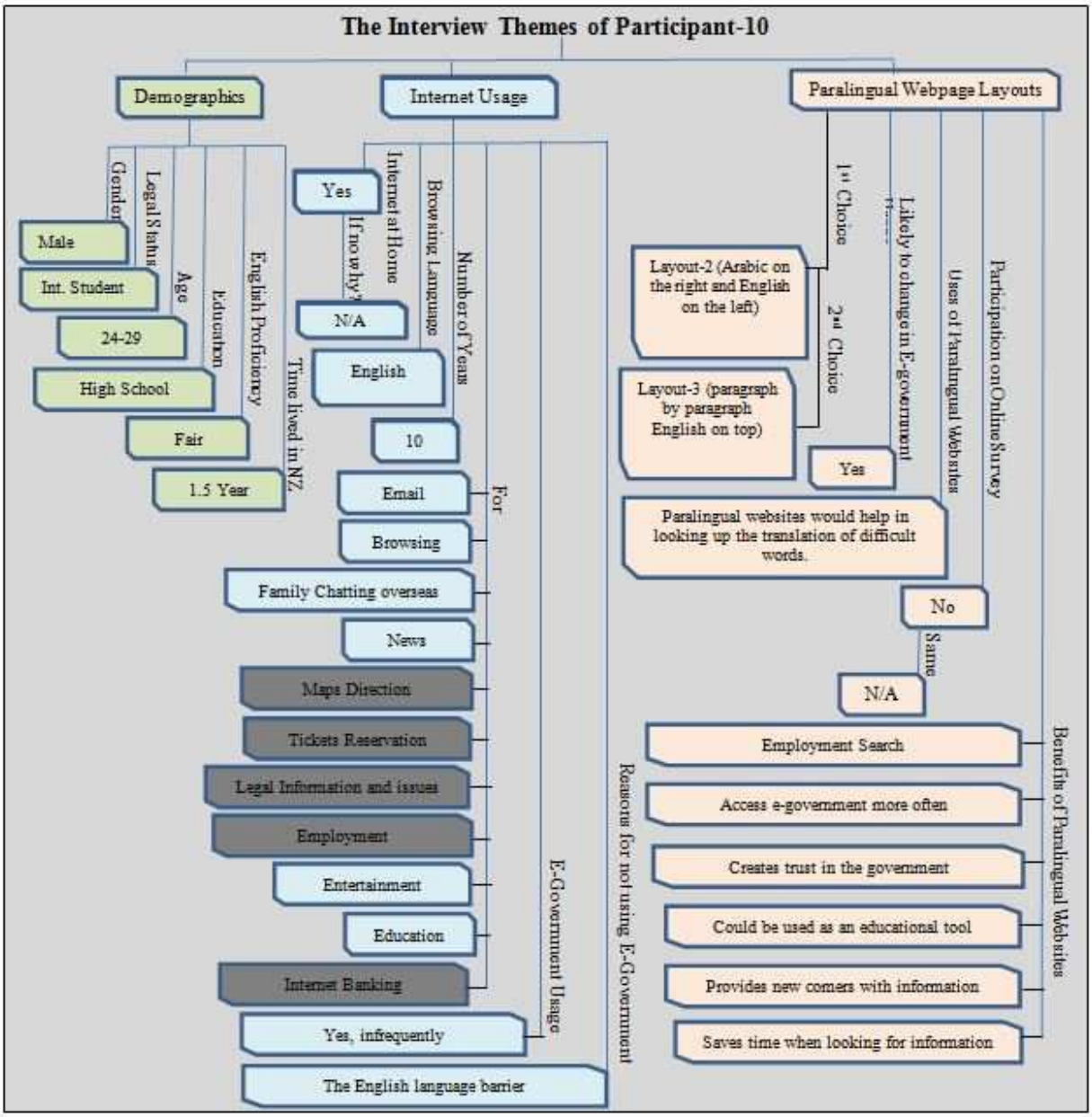


Figure 10 The Interview Themes of Participant 10.

The interview themes of Participant 11 are shown in Figure 11.

Appendix P The Participants' Interview Themes presented in Diagrams and their Analysis

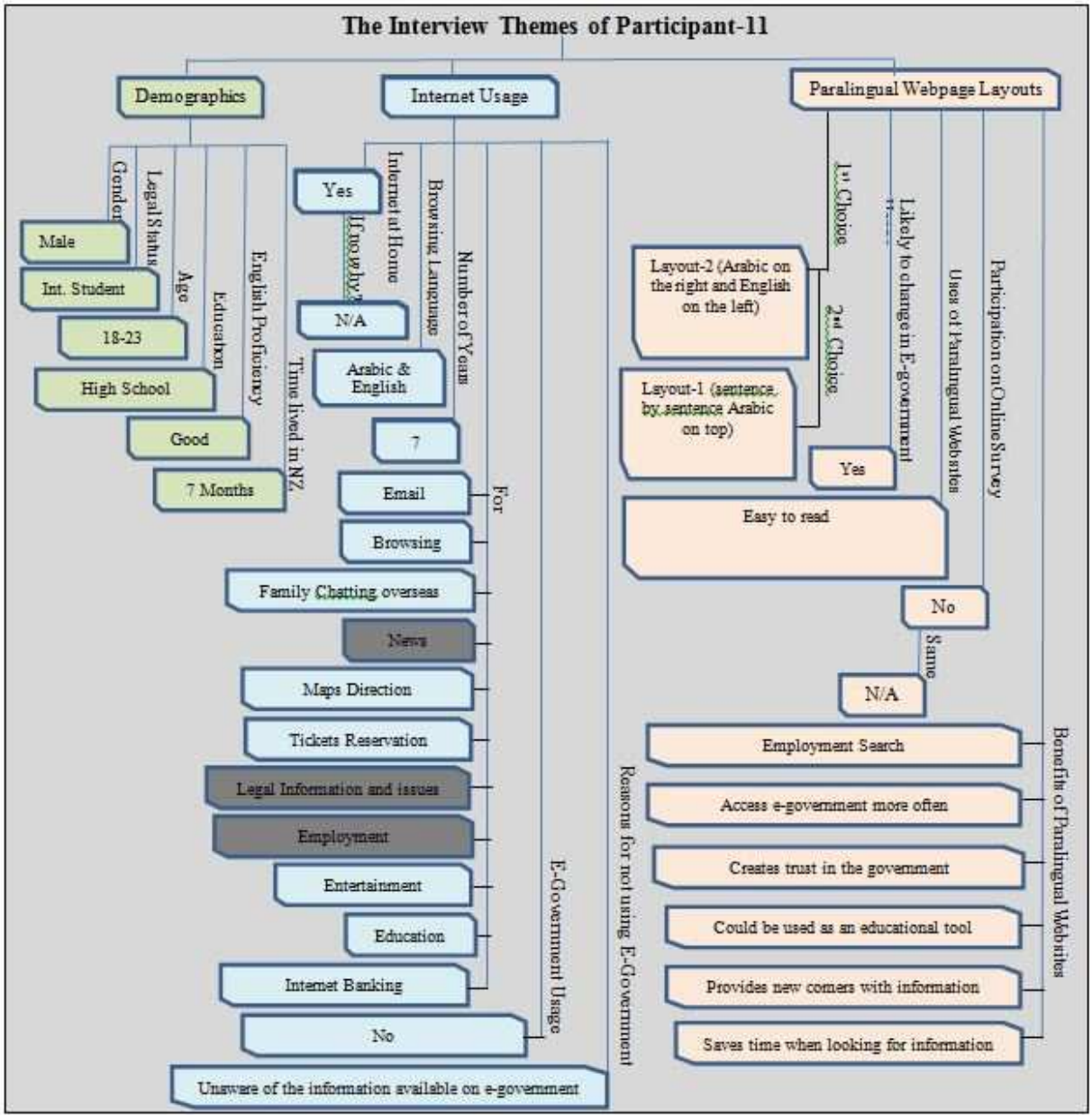


Figure 11 The Interview Themes of Participant 11.

The interview themes of Participant 12 are shown in Figure 12.

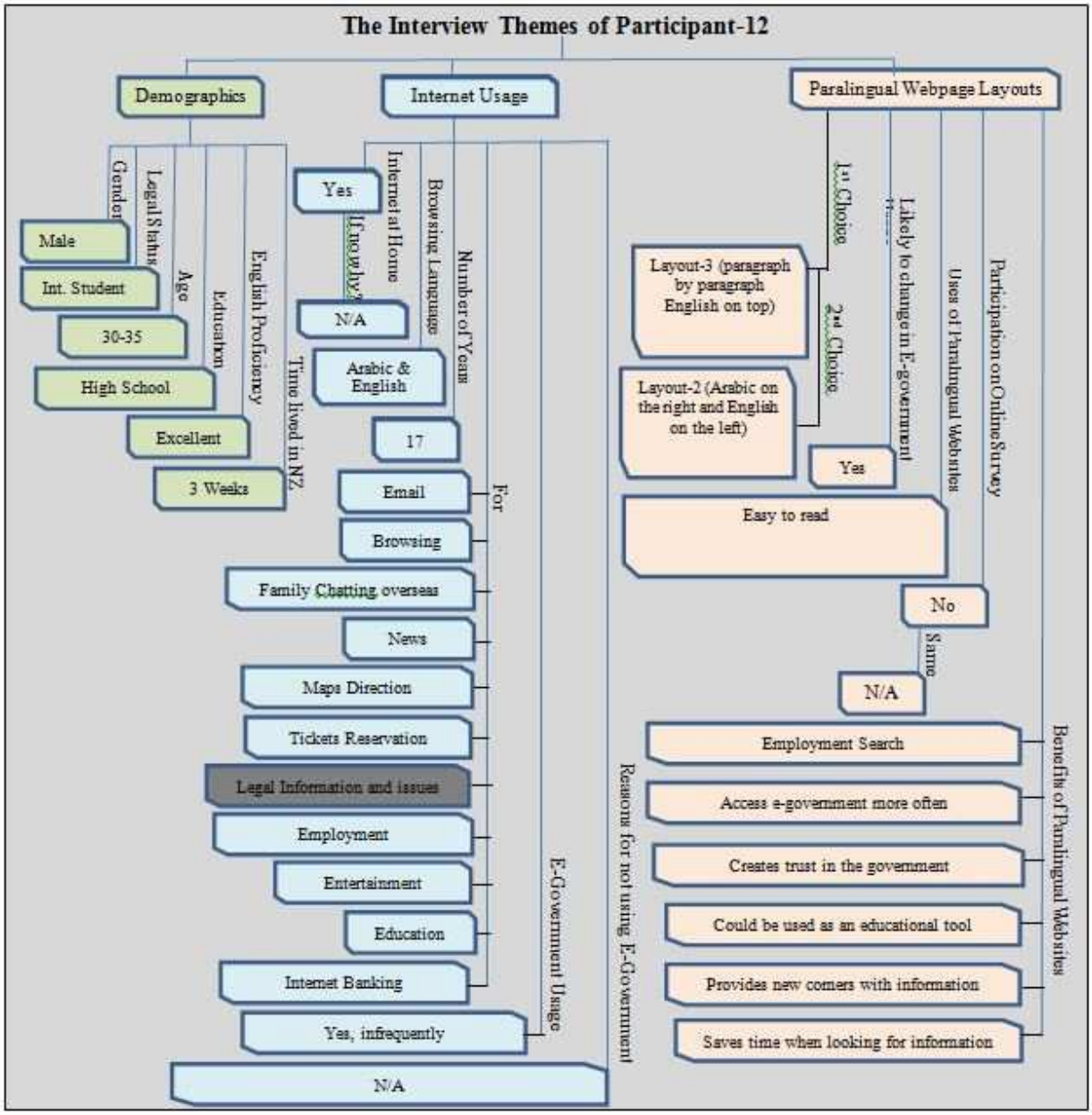


Figure 12 The Interview Themes of Participant 12.

The interview themes of Participant 13 are shown in Figure 13.

Appendix P The Participants' Interview Themes presented in Diagrams and their Analysis

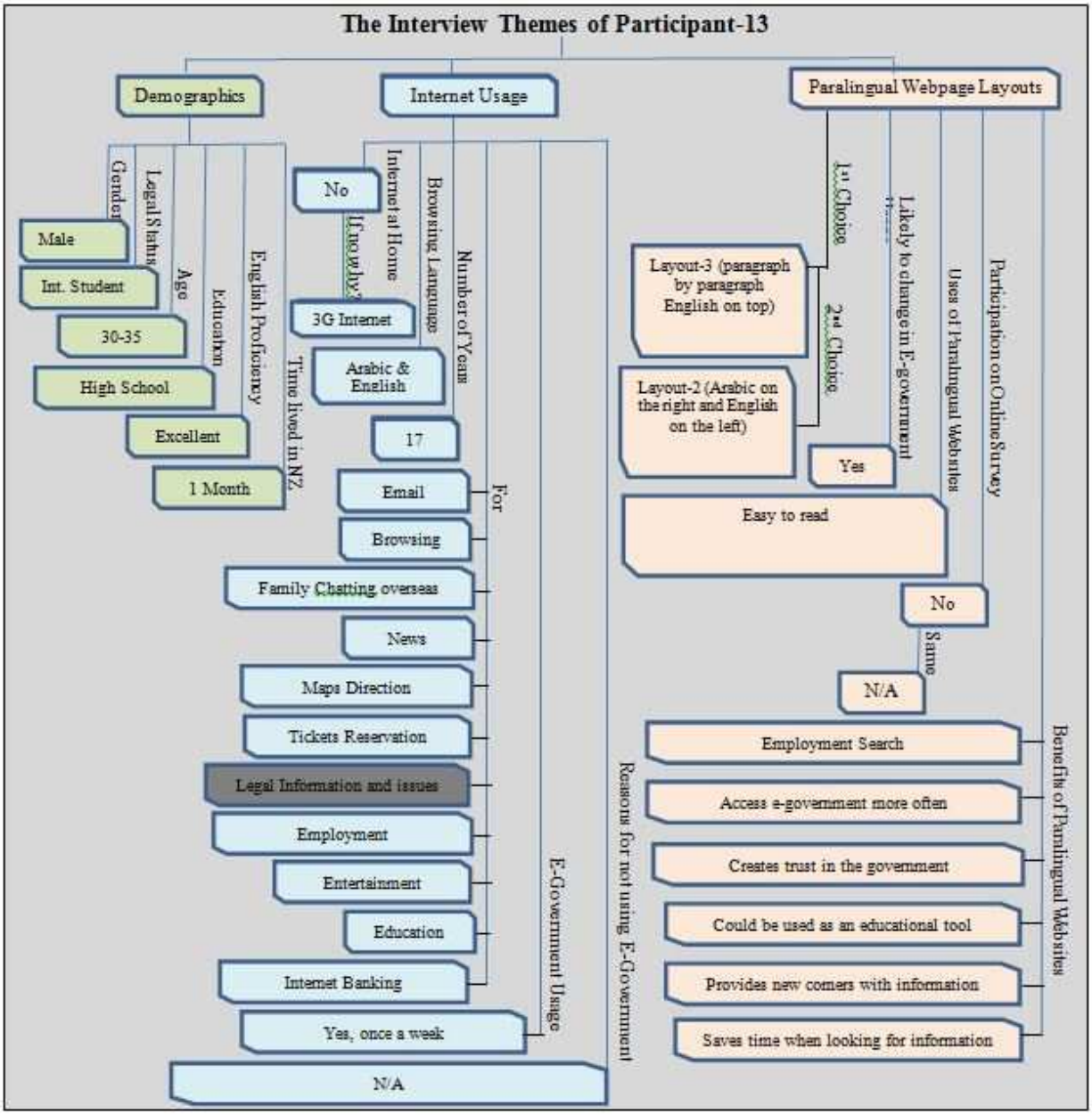


Figure 13 The Interview Themes of Participant 13.

The interview themes of Participant 14 are shown in Figure 14.

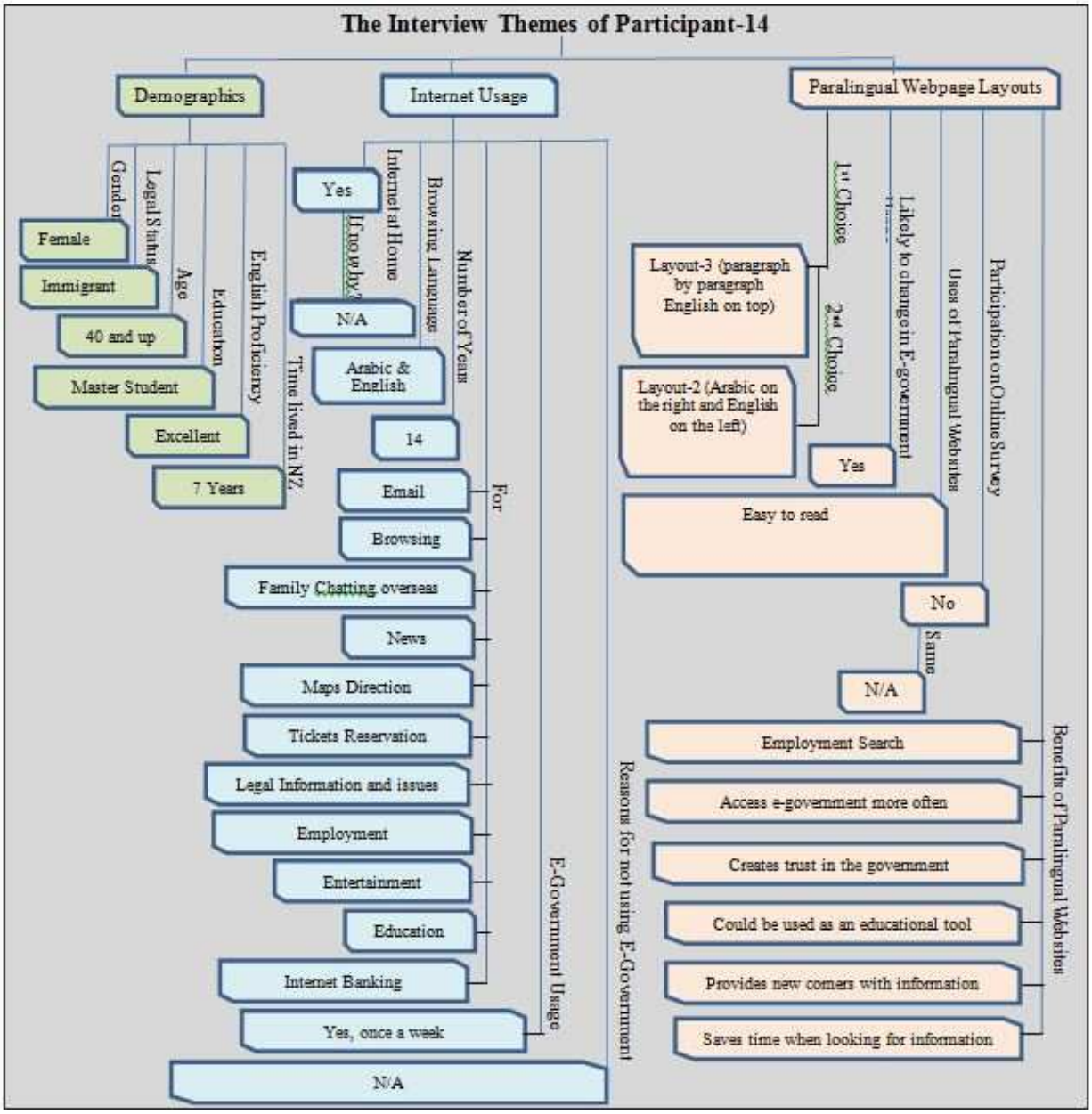


Figure 14 The Interview Themes of Participant 14.

The interview themes of Participant 15 are shown in Figure 15.

Appendix P The Participants' Interview Themes presented in Diagrams and their Analysis

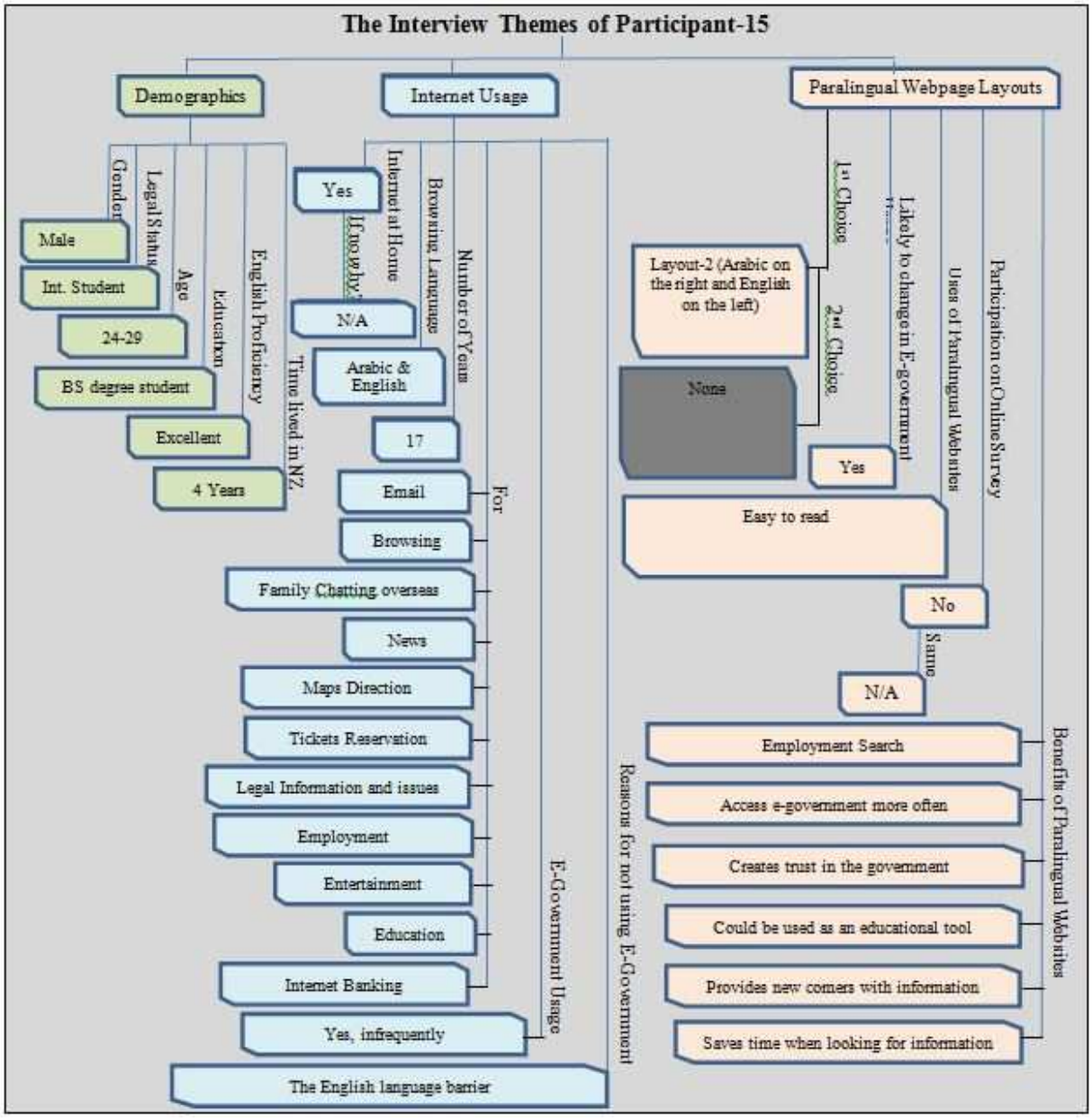


Figure 15 The Interview Themes of Participant 15.

The interview themes of Participant 16 are shown in Figure 16.

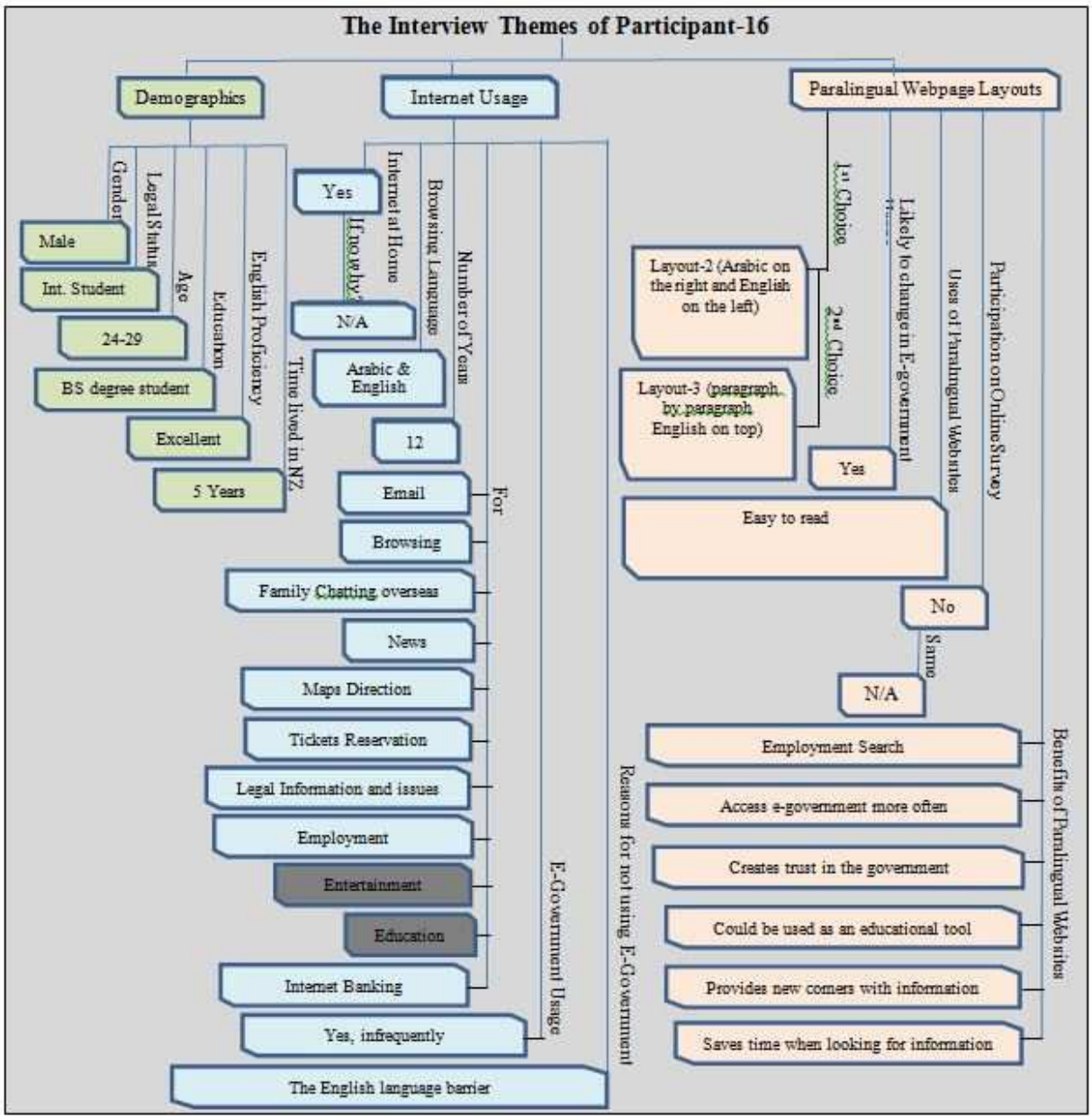


Figure 16 The Interview Themes of Participant 16.

The interview themes of Participant 17 are shown in Figure 17.

Appendix P The Participants' Interview Themes presented in Diagrams and their Analysis

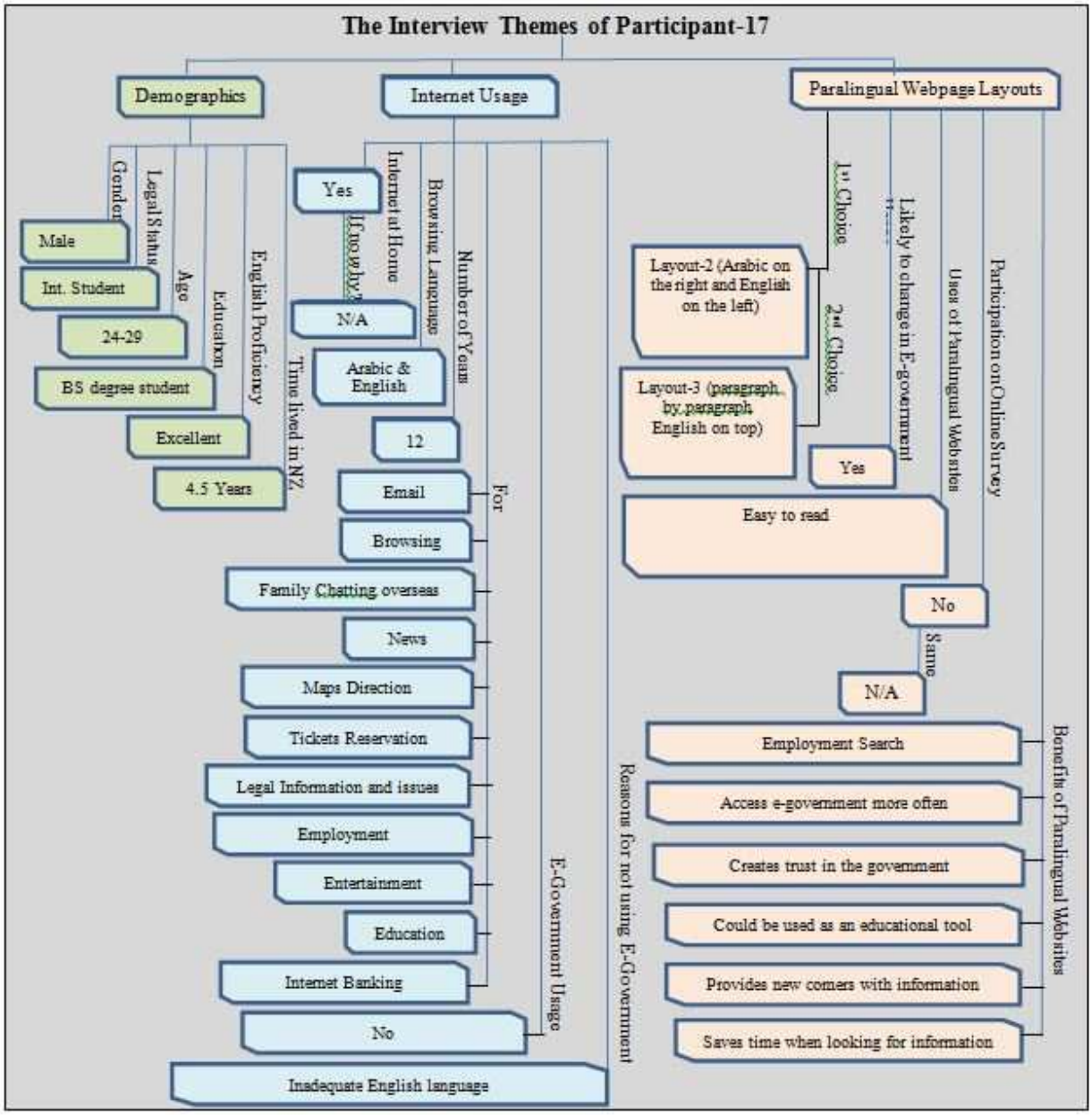


Figure 17 The Interview Themes of Participant 17.

The interview themes of Participant 18 are shown in Figure 18.

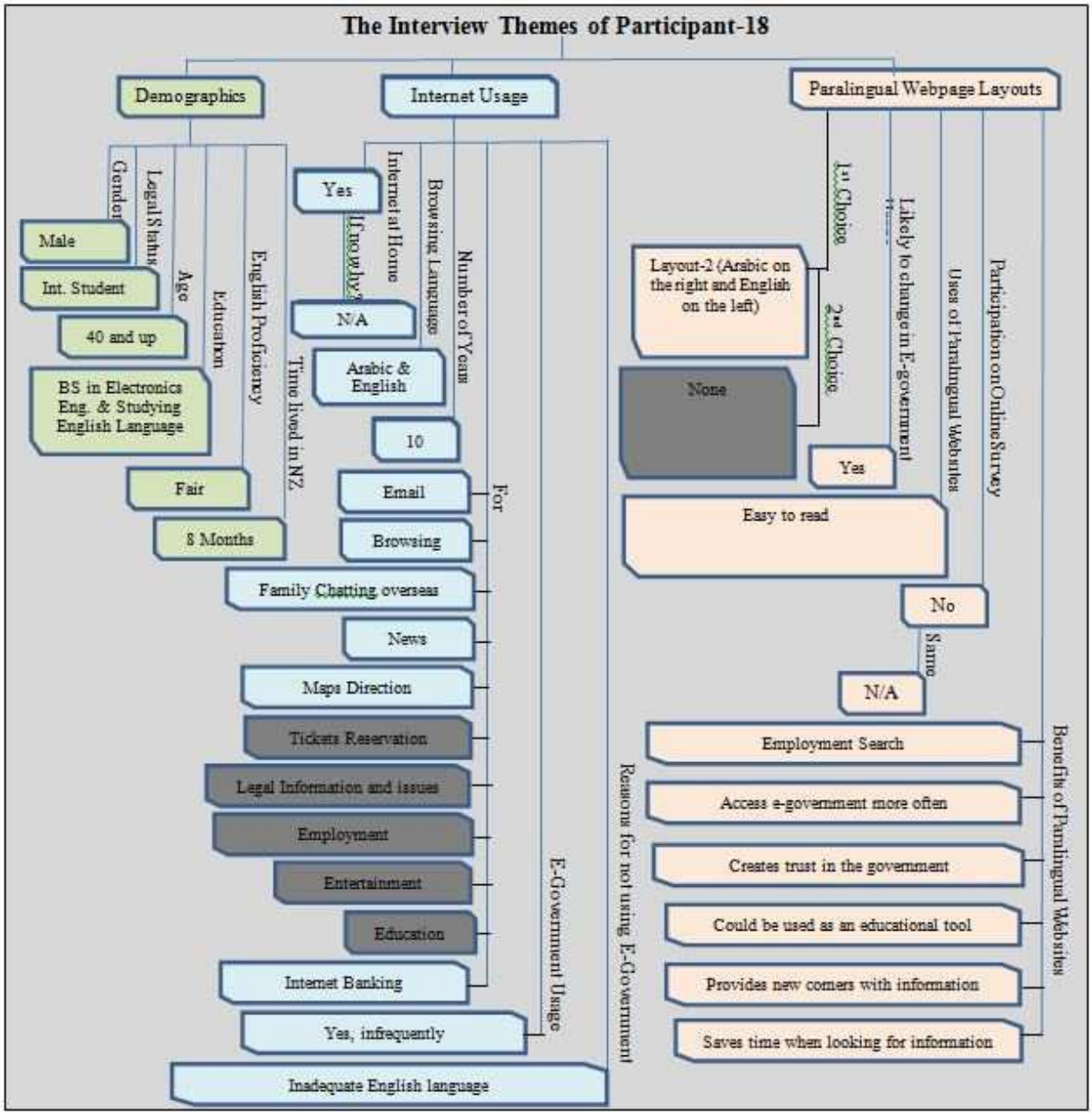


Figure 18 The Interview Themes of Participant 18.

The interview themes of Participant 19 are shown in Figure 19.

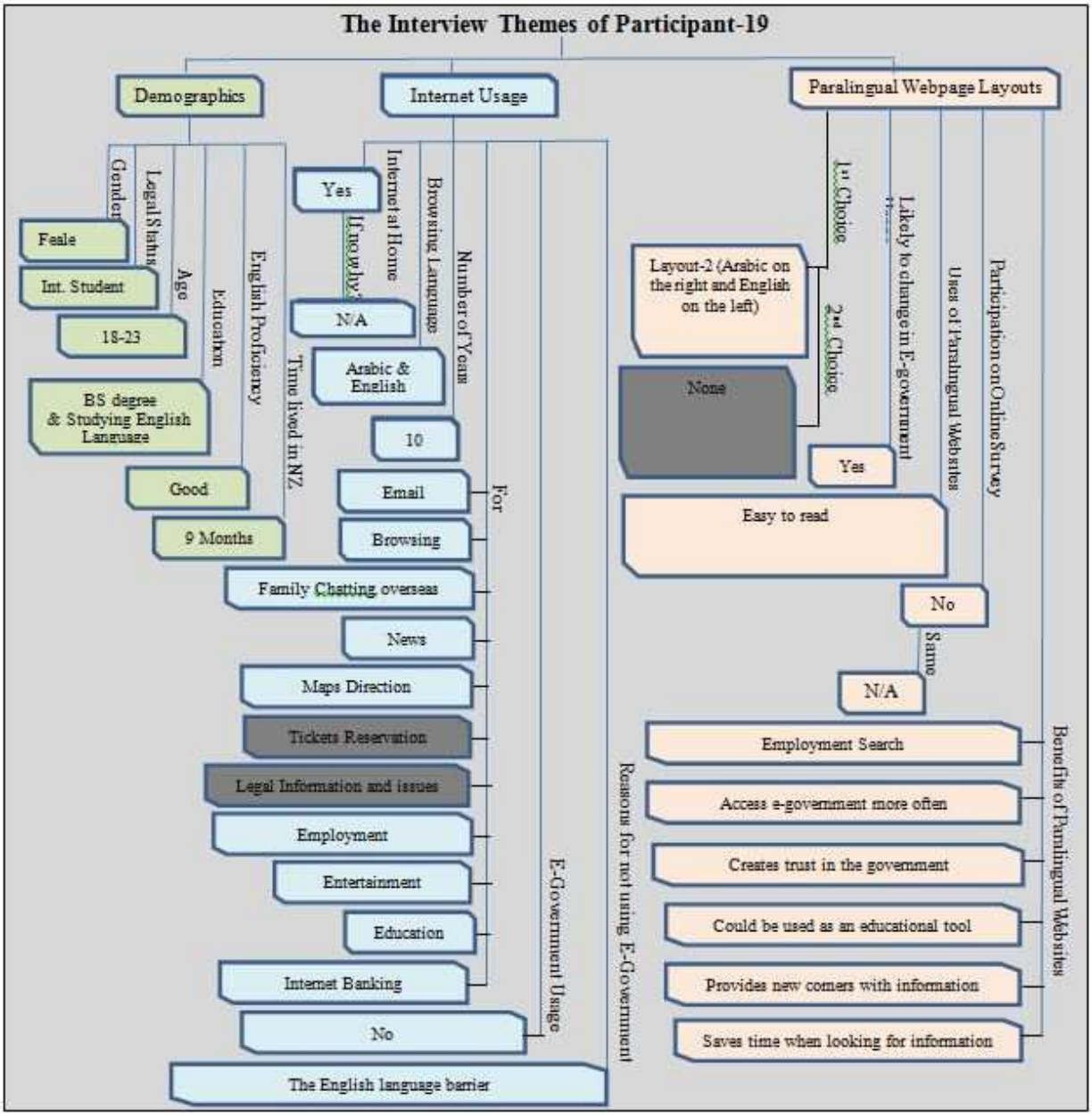


Figure 19 The Interview Themes of Participant 19.

The interview themes of Participant 20 are shown in Figure 20.

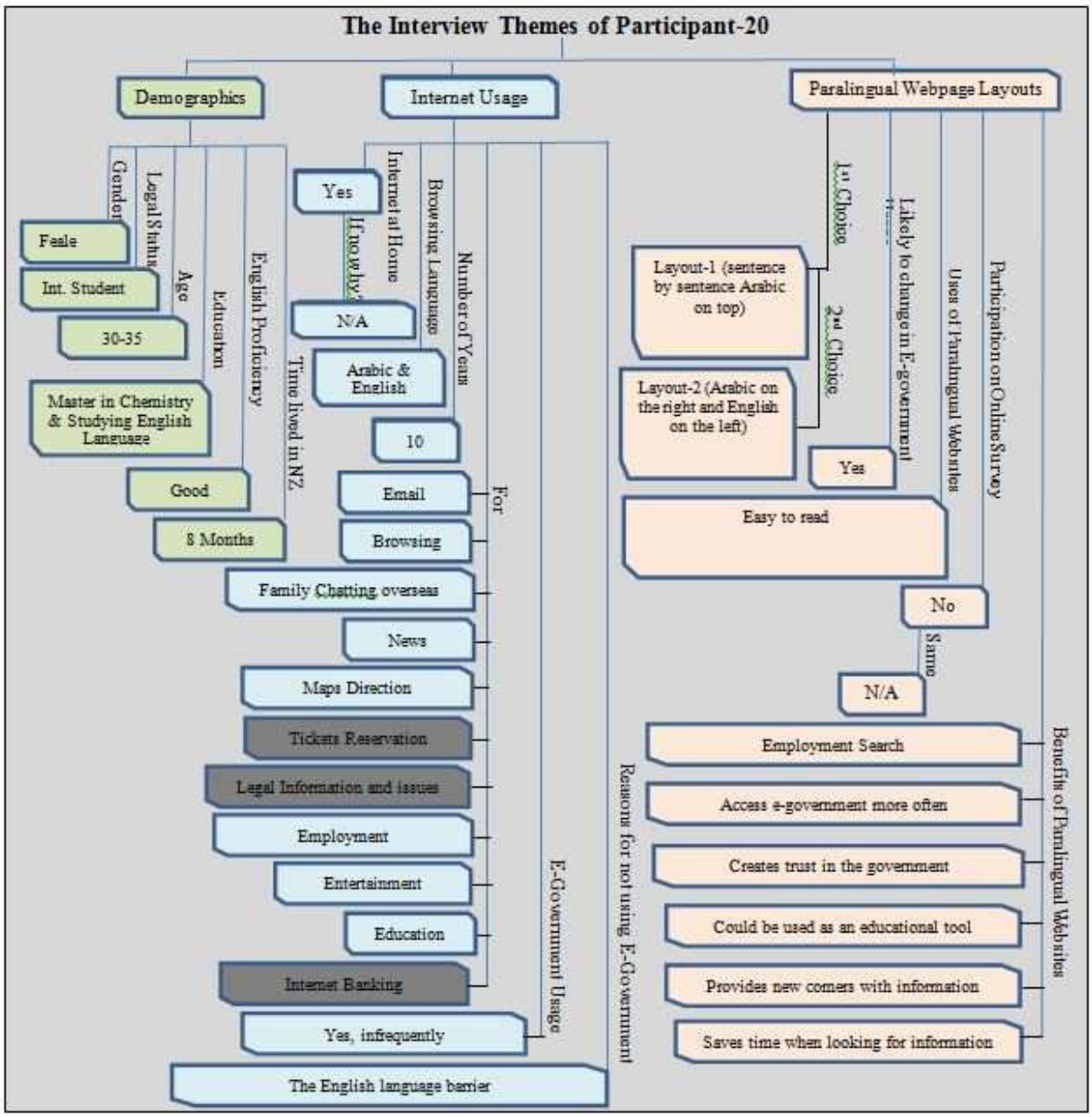


Figure 20 The Interview Themes of Participant 20.

The interview themes of Participant 21 are shown in Figure 21.

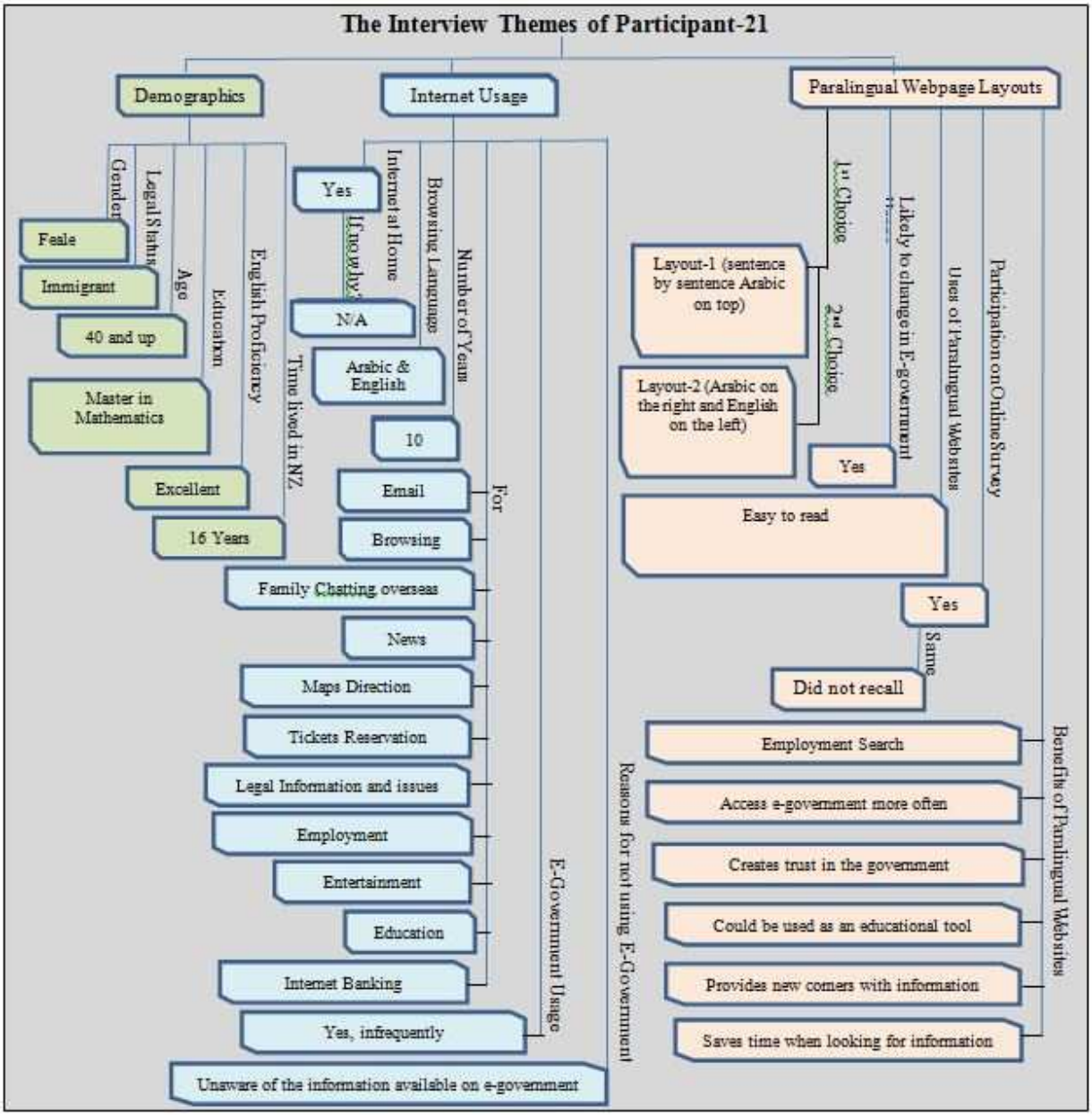


Figure 21 The Interview Themes of Participant 21.

The interview themes of Participant 22 are shown in Figure 22.

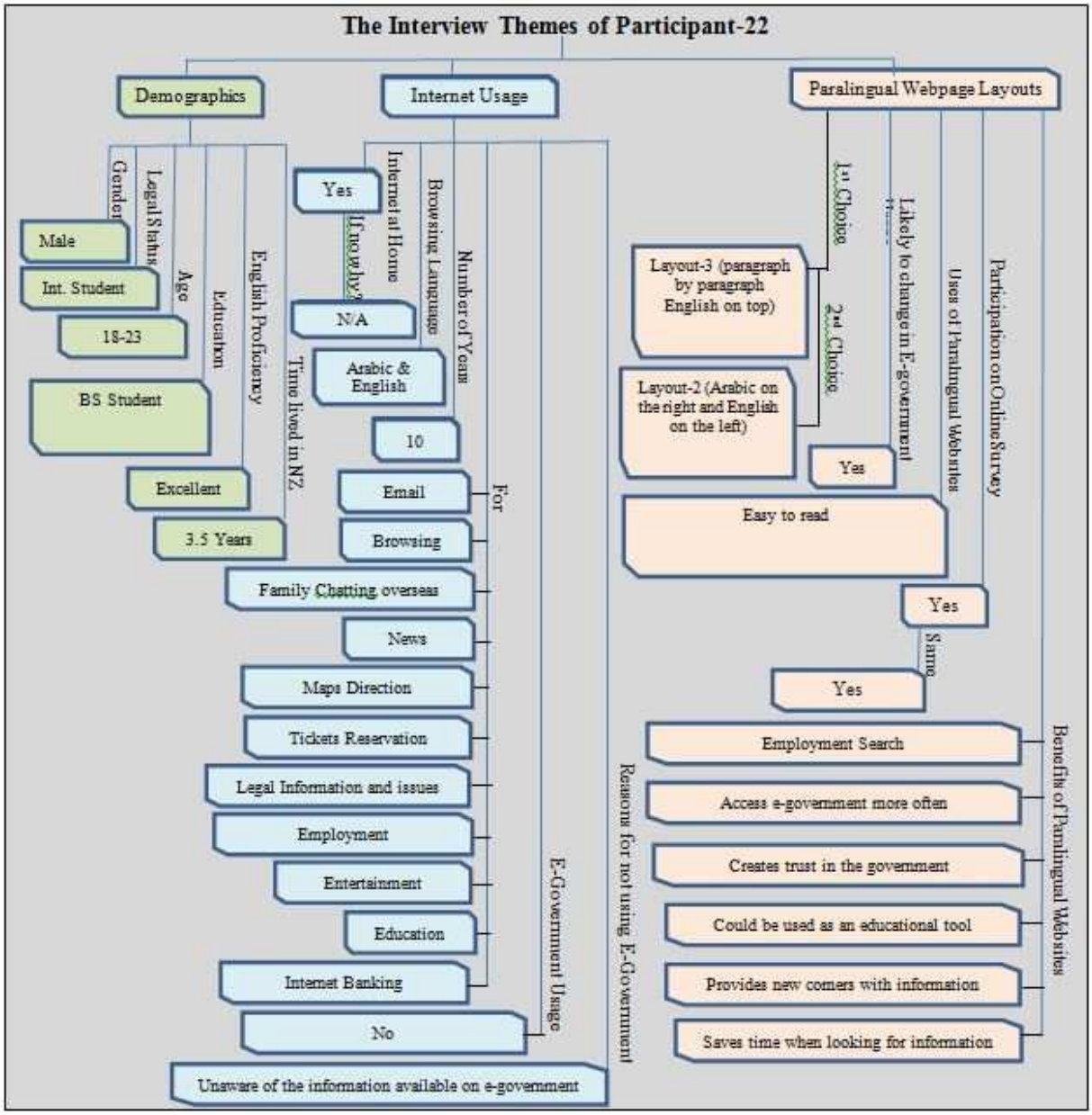


Figure 22 The Interview Themes of Participant 22.

The interview themes of Participant 23 are shown in Figure 23.

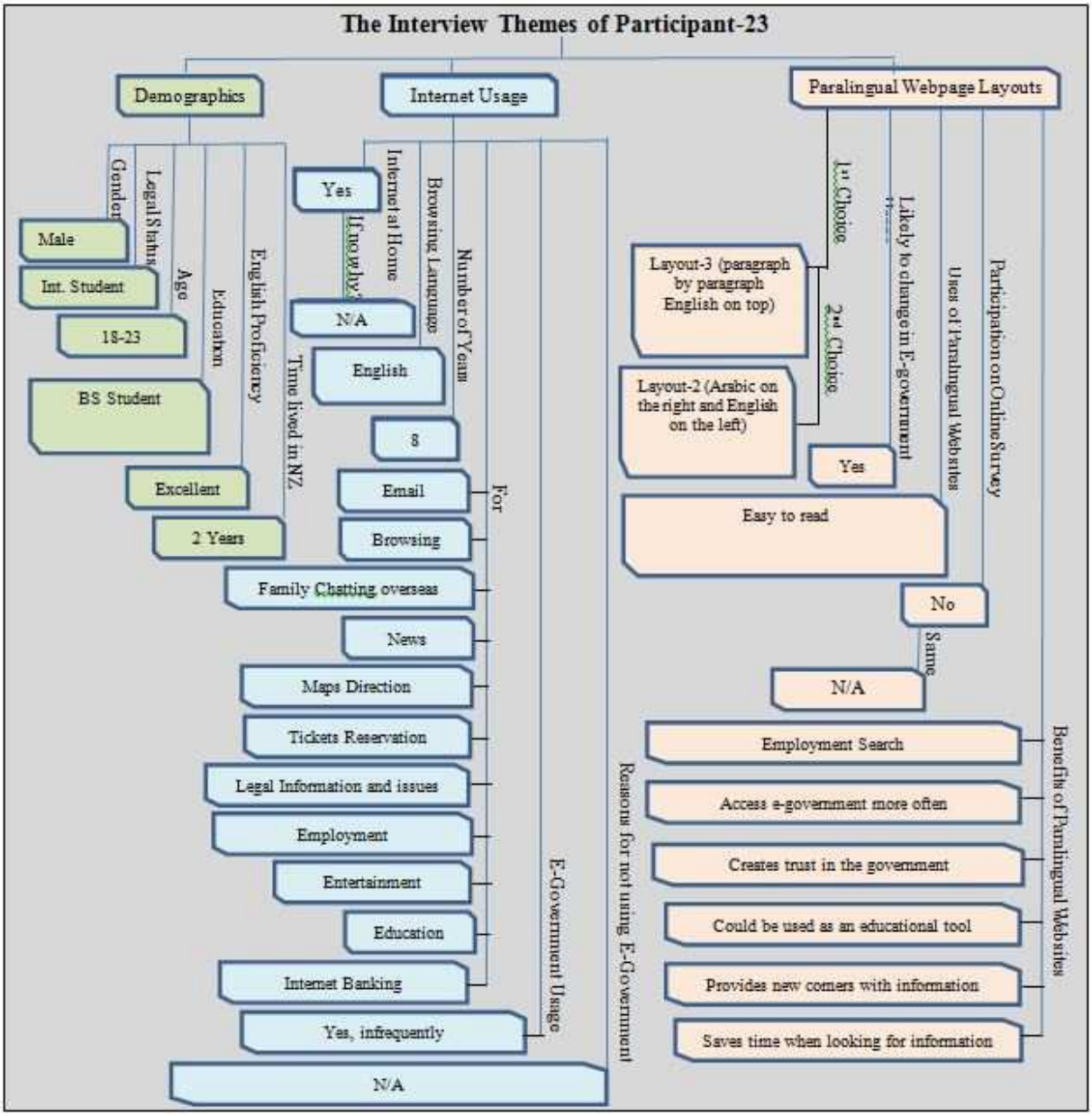


Figure 23 The Interview Themes of Participant 23.

The interview themes of Participant 24 are shown in Figure 24.

Appendix P The Participants' Interview Themes presented in Diagrams and their Analysis

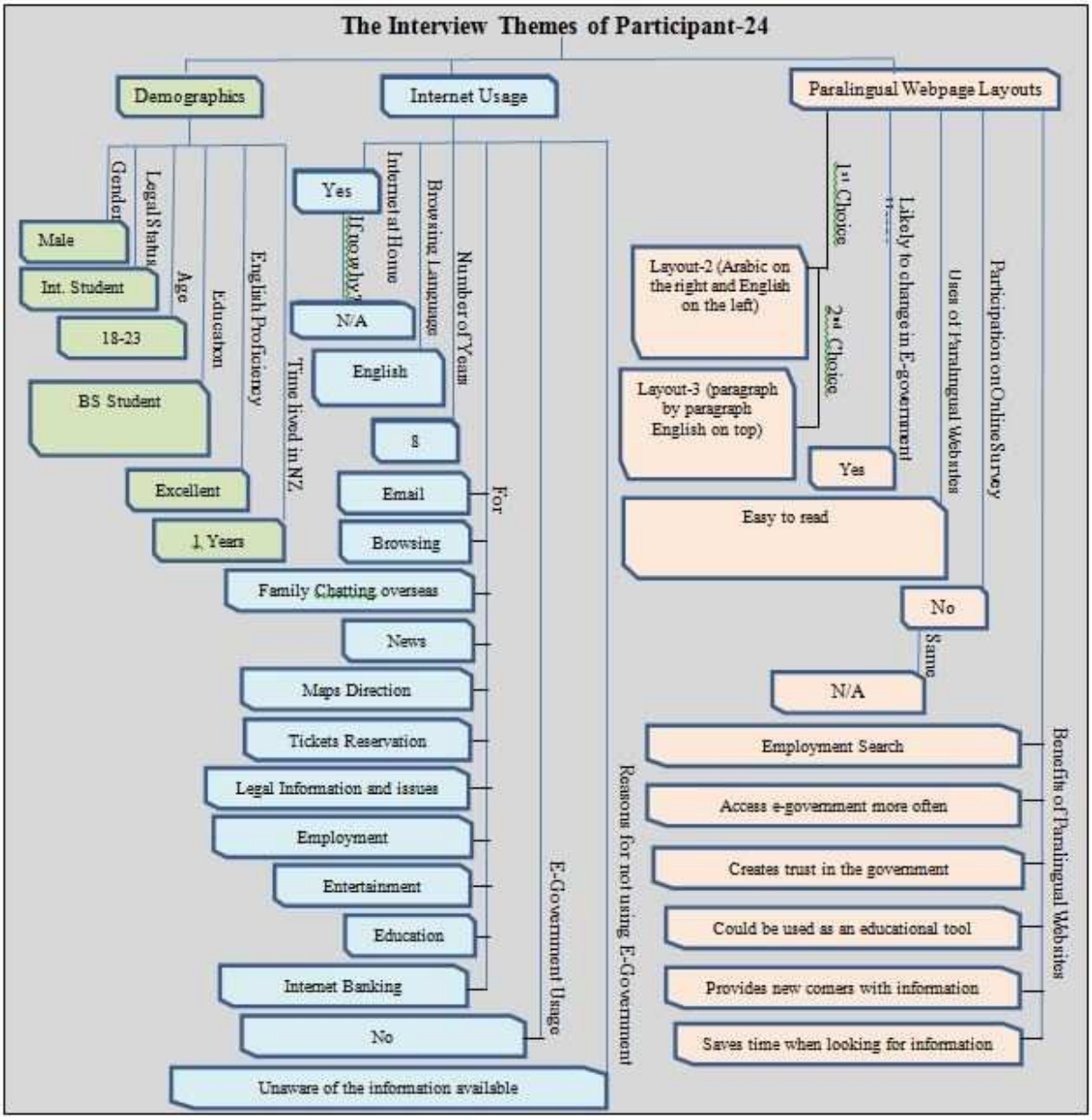


Figure 24 The Interview Themes of Participant 24.

Appendix Q The Participants' Interview Analysis

Table 1 A Summarised Analysis of Participant 1

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 1 is a male with work permit. 2. P 1 age is in the range of 36-39. 3. P 1 English proficiency is excellent, he is a medical doctor, and he lived in New Zealand for 7 years. 4. P 1 has Internet at home; he uses Arabic and English to browse the Internet; and he has been using the Internet for 15 years. 5. Participant 1 started reading Layout 3 (paragraph by paragraph by English on top) as AOI-1; he spent 45 seconds doing that; and he did not use the Paralingual layout to lookup for difficult words that he did not understand. 6. P 1 uses the Internet for email, communication, news, map direction, ticket reservation, internet banking, education, and music & entertainments. 7. P 1 used the e-government infrequently 8. P 1 1st choice selection is Layout 3 (paragraph by paragraph by English on top), and no 2nd choice selection in the interview. 9. P 1 thought that having Paralingual layout on e-government would not change his habit of using e-government. 10. During the interview P 1 revealed that he used to scan through the text when he was a student in the Medical School. 11. P 1 did not participate in the online survey. 12. The personal impression of the researcher that this participant does not believe that Paralingual is useful for him. 13. P 1 1st choice layout selection in the interview is Layout 3, matched his preferred layout selection in the eye tracking experiment. 14. P 1 has no 2nd choice layout selection in the interview.

Table 2 shows the eye tracking video analysis of Participant 1

Table 2 The Eye Tracking Video Analysis of Participant 1

Webpage-1 (Total = 2:15 Minutes)	**Webpage-2 (Total = 1:30 Minutes)**	**Webpage-3 (Total = 2:00 Minutes)**
Area of Interest-1 (AOI-1) P 1 started looking at Layout 3 (paragraph by paragraph by English on top) as AOI that was positioned in the middle. Started with the Arabic text then looked to the English text for 1 second. P 1 spent 45 seconds. **AOI-2** After 45 seconds, the second AOI-2 becameLayout 1 (sentence by sentence Arabic on top) for only 15	**AOI-1** P 1 started looking at Layout 2 (Arabic on the right and English on the left) for 15 seconds. **AOI-2** P 1 looked at Layout 1 (sentence by sentence Arabic on top) for another 15 seconds. **AOI-3** P 1 started reading Layout 3 (paragraph by paragraph by English on top) for 1 minute.	**AOI-1** P 1 started looking at Layout 1 (sentence by sentence Arabic on top) for 15 seconds. **AOI-2** P 1 started looking at Layout 2 (Arabic on the right and English on the left) for another 15 seconds. **AOI-3** P 1 continued showing interest in looking at Layout 3 (paragraph by paragraph by English on top) for 1:30

seconds. **AOI-3** P 1 spent another 1:15 minutes looking at Layout 3 (paragraph by paragraph by English on top) again.		minutes.

A summarised analysis of Participant 2 is shown in Table 3.

Table 3 A summarised Analysis of Participant 2

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 2 Preference layout is Layout 2 (Arabic on the right and English on the left) during the eye tracking experiment. 2. P 2 looked for a word translation twice. 3. P 2 is an international student; he has a master degree and doing his PhD; and he is a male. 4. P 2 age is in the range 24-29; and he has been in New Zealand for one month. 5. P 2 uses Arabic and English when browsing the Internet. His English language is excellent. 6. P 2 has been using the Internet for 10 years, and he uses the Internet for email, communication, news, map direction, and internet banking. 7. P 2 infrequently used the e-government. 8. P 2 did not express a change of habit to use e-government if Paralingual layouts were used; and he was not aware of the information available on it. 9. P 2 did not participate in the online survey. P 2 believed that there are many advantages of using Paralingual layouts such as: provides newcomers with important information; saves time looking for information; and access e-government more often. 10. The personal impression of the researcher that this participant does not believe that Paralingual is useful for him. 11. P 2 1st choice layout selection in the interview is Layout 2, matched his preferred layout selection in the eye tracking experiment. 12. P 2 2nd choice layout selection in the interview is Layout 3. Note: (There was two seconds difference between 1st and 2nd choices, so it was considered as a match).

Table 4 shows the eye tracking video analysis of Participant 2.

Table 4 The Eye Tracking Video Analysis of Participant 2

Webpage-1 (Total = 2:00 Minutes)	**Webpage-2 (Total = 1:08 Minutes)**	**Webpage-3 (Total = 0:49 Minutes)**
Area of Interest-1 (AOI-1) P 2 Started strait away reading Layout 3 (paragraph by paragraph by English on top) and he spent two minutes reading the Arabic translation.	**AOI-1** P 2 started this time reading Layout 2, he spent 48 seconds reading the Arabic translation then he started reading the English text and he spent 20 sends only.	**AOI-1** This time P 2 looked at all three layouts, this action took 14 seconds. **AOI-2** P 2 started reading the English text of Layout 2 (Arabic on the right and English on the left) and

		after 20 seconds he looked a word in the Arabic translation, then he continued reading Layout 2 (Arabic on the right and English on the left) in English. After 15 seconds he looked another word's translation.

A summarised analysis of Participant 3 is shown in Table 5.

Table 5 A summarised Analysis of Participant 3

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 3 is male, international student, his age is in the range of 18-23, his English proficiency is fair, and he has been in New Zealand for 4 months. 2. P 3 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 6 years. 3. P 3 uses the Internet for communicating with family overseas, news, maps direction, internet banking, education, and entertainment. 4. P 3 uses e-government infrequently. 5. P 3 selected Layout 3 (paragraph by paragraph by English on top) as his 1st choice, and Layout 1 (sentence by sentence Arabic on top) as his second choice in the interview. 6. P 3 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 3 is discouraged from accessing e-government due to the English language barrier. 8. P 3 ticked the followings as the benefits of Paralingual websites: employment search, access e-government more often, creates trust in the government, could be used as an educational tool, provide newcomers with important information, and saves time when looking for important information 9. P 3 did not participate in the online survey. 10. P 3 looked up difficult English words in Arabic translation. 11. P 3 started reading the English text first. 12. The participant was interested in Paralingual webpage layouts and very sincere in his choices. 13. P 3 1st choice layout selection in the interview is Layout 3, matched his preferred layout selection in the eye tracking experiment.

Table 6 shows the eye tracking video analysis of Participant 3.

Table 6 The Eye Tracking Video Analysis of Participant 3.

Webpage-1 (Total = 3:15 Minutes)	**Webpage-2 (Total = 1:30 Minutes)**	**Webpage-3 (Total = 2:00 Minutes)**
Area of Interest-1 (AOI-1) P 3 Spent 30 seconds looking at all three layouts.	**AOI-1** P 3 started reading Layout 3 (paragraph by paragraph by English on top)	**AOI-1** P 3 started reading the English text of Layout 3 (paragraph by paragraph by

AOI-2 P 3 started reading Layout 3 (paragraph by paragraph by English on top) the English text, he looked for translation in Arabic. **AOI-3** P 3 shifted to reading Layout 1 (sentence by sentence Arabic on top) on the left corner. **AOI-4** P 3 went back to reading Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the page. During reading the English text he looked three times to words' translations in Arabic.	positioned on the right hand corner of the screen, he started reading the English text, and looked for words' translations two times. He started reading the Arabic translation.	English on top), he spent 1 minute and then he looked for Arabic translation of English words three times. He started reading the Arabic text for 30 seconds.

A summarised analysis of Participant 4 is shown in Table 7.

Table 7 A summarised Analysis of Participant 4

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 4 is male, international student, his age is in the range of 18-23, his English proficiency is Good, and he has been in New Zealand for 3.5 months. 2. P 4 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 7 years. 3. P 4 uses the Internet for email, communicating with family overseas, news, maps direction, internet banking, education, and entertainment. 4. P 4 uses e-government infrequently. 5. P 4 selected Layout 1 (sentence by sentence Arabic on top) as his 1st choice only, and no second choice selection in the interview. 6. P 4 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 4 is discouraged from accessing e-government due to the English language barrier. 8. P 4 ticked the followings as the benefits of Paralingual websites: employment search, access e-government more often, creates trust in the government, could be used as an educational tool, provide newcomers with important information, and saves time when looking for important information. 9. P 4 did not participate in the online survey. 10. P 4 looked up difficult English words in Arabic translation. 11. P 4 started reading the Arabic translation first. 12. The participant was honest and truthful in the eye tracking experiment. 13. P 4 1st choice layout selection in the interview is Layout 1, matched his preferred

layout selection in the eye tracking experiment.

Table 8 shows the eye tracking video analysis of Participant 4.

Table 8 The Eye Tracking Video Analysis of Participant 4.

Webpage-1 (Total = 3:30 Minutes)	**Webpage-2 (Total = 2:55 Minutes)**	**Webpage-3 (Total = 2:15 Minutes)**
Area of Interest-1 (AOI-1) P 4 Spent 20 seconds looking at all three layouts. **AOI-2** P 4 started reading Layout 1 (sentence by sentence Arabic on top) the line by line presentation. He looked for difficult English words two times during reading Layout 1 (sentence by sentence Arabic on top).	**AOI-1** P 4 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen, and he looked up difficult English words in Arabic three times.	**AOI-1** P 4 started reading the English text of Layout 1 (sentence by sentence Arabic on top), he continued reading line by line, the Arabic translation, then the English text.

A summarised analysis of Participant 5 is shown in Table 9.

Table 9 A Summarised Analysis of Participant 5

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 5 is male, international student, his age is in the range of 18-23, his English proficiency is Good, and he has been in New Zealand for 1.5 months. 2. P 5 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 6 years. 3. P 5 uses the Internet for email, communicating with family overseas, news, maps direction, internet banking, education, and entertainment. 4. P 5 uses e-government one a week. 5. P 5 selected Layout 2 (Arabic on the right and English on the left) as his primary choice, and Layout 1 (sentence by sentence Arabic on top) as his 2nd choice in the interview. 6. P 5 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 5 is not discouraged from accessing e-government. 8. P 5 ticked the followings as the benefits of Paralingual websites: employment search, creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 5 did not participate in the online survey. 10. P 5 looked up difficult English words in Arabic translation. 11. P 5 started reading the English text first. 12. P 5 took a very long time while doing the eye tracking experiment, he was a little distracted and not fully concentrating on looking at the screen and he was looking away from the eye tracker. The eye tracker recorded that during the experiment.

13. P 5 1st choice layout selection in the interview is Layout 2, did not match his preferred layout selection in the eye tracking experiment, which is Layout 3.

Table 10 shows the eye tracking video analysis of Participant 5.

Table 10 The Eye Tracking Video Analysis of Participant 5

Webpage-1 (Total = 9:08 Minutes)	**Webpage-2 (Total = 7:40 Minutes)**	**Webpage-3 (Total = 4:00 Minutes)**
Area of Interest-1 (AOI-1) P 5 Spent 44 seconds looking at all three layouts. **AOI-2** P 5 started looking at Layout 3 (paragraph by paragraph by English on top) for 1:10 minutes. **AOI-3** P 5 is now reading through Layout 2. **AOI-4** P 5 is looking again at Layout 3 (paragraph by paragraph by English on top), and reading the Arabic translation, now reading through the English text. He spent almost 7 minutes reading through Layout 3 (paragraph by paragraph by English on top).	**AOI-1** P 5 started reading Layout 3 (paragraph by paragraph by English on top) positioned in the right hand corner of the screen. It took him 3:30 minutes till he changed his AOI. **AOI-2** P 5 started reading through Layout 1 (sentence by sentence Arabic on top) in the middle of the screen. **AOI-3** P 5 changed his AOI after 1:35 minutes to reading the English text on Layout 2, started with the Arabic text, it took him 1:10 minutes. The he started reading the English text. P 5 looked up for the translation of English words in Arabic. P 5 spent 4 minutes reading Layout 2.	**AOI-1** P 5 started reading the English text of Layout 1 (sentence by sentence Arabic on top), he continued reading line by line, the Arabic translation, then the English text. P 5 spent 3:00 minutes reading through Layout 1 (sentence by sentence Arabic on top). **AOI-2** P 5 is now reading through Layout 2. Stated with the English text, then he looked up the translation of an English word in Arabic. P 5 spent 1 minute reading Layout 2. **AOI-3** P 5 started reading through Layout 3 (paragraph by paragraph by English on top) starting with the English text. P 5 spent 50 seconds reading through Layout 3 (paragraph by paragraph by English on top). **AOI-4** P 5 again was reading Layout 2 (Arabic on the right and English on the left) started with the Arabic translation, and then started reading the English text. P 5 Looked for translation of English words in Arabic. P 5 spent 2 minutes

		reading Layout 2.

A summarised analysis of Participant 6 is shown in Table 11.

Table 11 A Summarised Analysis of Participant 6

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 6 is male, international student, his age is in the range of 18-23, his English proficiency is Good, and he has been in New Zealand for 1.5 months. 2. P 6 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 6 years. 3. P 6 uses the Internet for email, communicating with family overseas, news, maps direction, internet banking, education, and entertainment. 4. P 6 never used e-government . 5. P 6 1st choice selection is Layout 1 (sentence by sentence Arabic on top), and no 2nd choice selection in the interview. 6. P 6 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 6 is not discouraged from accessing e-government. 8. P 6 ticked the followings as the benefits of Paralingual websites: creates trust in the government; could be used as an educational tool; and saves time when looking for important information. 9. P 6 did not participate in the online survey. 10. P 6 looked up difficult English words in Arabic translation. 11. P 6 started reading the Arabic translation first. 12. P 6 took his time to go through Layout 1 (sentence by sentence Arabic on top) 13. P 6 1st choice layout selection in the interview is Layout 1, matched his preferred layout selection in the eye tracking experiment.

Table 12 shows the eye tracking video analysis of Participant 6.

Table 12 The Eye Tracking Video Analysis of Participant 6.

Webpage-1 (Total = 10:45 Minutes)	**Webpage-2 (Total = 10:10 Minutes)**	**Webpage-3 (Total = 8:40 Minutes)**
Area of Interest-1 (AOI-1) P 6 started looking at Layout 1 (sentence by sentence Arabic on top) for 20 seconds then Layout 3 (paragraph by paragraph by English on top), then back to Layout 1 (sentence by sentence Arabic on top) positioned in the left hand corner of the screen. It took P 6 10:45 minutes. It was easier for P 6 to lookup English words instantaneously translations in Arabic	**AOI-1** P 6 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen. P 6 Looked up English words for translation in Arabic at least three times.	**AOI-1** P 6 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen. P 6 looked up English words for translation in Arabic three times.

while reading Layout 1 (sentence by sentence Arabic on top).		

A summarised analysis of Participant 7 is shown in Table 13.

Table 13 A Summarised Analysis of Participant 7

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 7 is male, international student, his age is in the range of 18-23, his English proficiency is Good, and he has been in New Zealand for 3 weeks. 2. P 7 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 10 years. 3. P 7 uses the Internet for email; Internet browsing; communicating with family overseas; news; maps direction; tickets reservation; legal information; employment; Internet banking; education; and entertainment. 4. P 7 uses e-government infrequently. 5. P 7 selected Layout 1 (sentence by sentence Arabic on top) as 1st choice, and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 7 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 7 is not discouraged from accessing e-government. 8. P 7 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 7 did not participate in the online survey. 10. P 7 looked up difficult English words in Arabic translation. 11. P 7 started reading the Arabic text first. 12. P 7 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen. 13. P 7 1st choice layout selection in the interview is Layout 1, matched his preferred layout selection in the eye tracking experiment.

Table 14 shows the eye tracking video analysis of Participant 7.

Table 14 The Eye Tracking Video Analysis of Participant 7

Webpage-1 (Total = 3:25 Minutes)	**Webpage-2 (Total = 3:15 Minutes)**	**Webpage-3 (Total = 3:00 Minutes)**
Area of Interest-1 (AOI-1) P 7 started reading Layout 1 (sentence by sentence Arabic on top) for 2 minutes, positioned in the left hand corner of the screen. P 7 looked up English words for translation in Arabic two times. **AOI-2** P 7 Changed his AOI to	**AOI-1** P 7 started looking at Layout 2 (Arabic on the right and English on the left) positioned in the left hand corner of the screen for 15 seconds **AOI-2** P 7 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen.	**AOI-1** P 7 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen. P 7 took 2:15 minutes. P 7 looked up English words for translation in Arabic three times. **AOI-2** P 7 Changed his AOI from

Layout 2 (Arabic on the right and English on the left) for 20 seconds only.	P 7 took 3:00 minutes reading Layout 1 (sentence by sentence Arabic on top). P 7 looked up English words for translation in Arabic three times.	Layout 1 (sentence by sentence Arabic on top) to Layout 2 (Arabic on the right and English on the left) only for 30 seconds. **AOI-3** P 7 Changed his AOI to Layout 1 (sentence by sentence Arabic on top) again and continued reading through it. P 7 took another 15 seconds to continue reading Layout 1 (sentence by sentence Arabic on top)

A summarised analysis of Participant 8 is shown in Table 15.

Table 15 A Summarised Analysis of Participant 8

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 8 is male, international student, his age is in the range of 18-23, his English proficiency is Good, and he has been in New Zealand for 3 weeks. 2. P 8 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 10 years. 3. P 8 uses the Internet for email; Internet browsing; communicating with family overseas; news; maps direction; tickets reservation; legal information; employment; Internet banking; education; and entertainment. 4. P 8 uses e-government infrequently. 5. P 8 selected Layout 1 (sentence by sentence Arabic on top) as 1st choice, and Layout 3 (paragraph by paragraph by English on top) as 2nd choice in the interview. 6. P 8 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 8 is not discouraged from accessing e-government. 8. P 8 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 8 did not participate in the online survey. 10. P 8 looked up difficult English words in Arabic translation. 11. P 8 started reading the Arabic text first. 12. P 8 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen. 13. P 8 1st choice layout selection in the interview is Layout 1, matched his preferred layout selection in the eye tracking experiment.

Table 16 shows the eye tracking video analysis of Participant 8.

Table 16 The Eye Tracking Video Analysis of Participant 8

Webpage-1 (Total = 2:35 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 2:50 Minutes)**

Area of Interest-1 (AOI-1)	**AOI-1**	**AOI-1**
P 8 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the left hand corner of the screen for 2:35 minutes. P 8 looked up English words for translation in Arabic five times.	P 8 started looking at Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen for 2 minutes. P 8 looked up English words for translation in Arabic five times.	P 8 started reading through Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen for 2:50 minutes. P 8 looked up English words for translation in Arabic four times.

A summarised analysis of Participant 9 is shown in Table 17.

Table 17 A Summarised Analysis of Participant 9

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 9 is male, international student, his age is in the range of 18-23, his English proficiency is Good, and he has been in New Zealand for 1 month. 2. P 9 has Internet at home, he uses Arabic & English to browse the Internet, and he has been using the Internet for 8 years. 3. P 9 uses the Internet for email; Internet browsing; communicating with family overseas; legal information; employment; education; and entertainment. 4. P 9 uses e-government infrequently. 5. P 9 selected Layout 3 (paragraph by paragraph by English on top) as 1st choice, and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 9 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 9 is not discouraged from accessing e-government. 8. P 9 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 9 did not participate in the online survey. 10. P 9 did not look up difficult English words in Arabic translation. 11. P 9 started reading the English text first. 12. P 9 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen. 13. P 9 1st choice layout selection in the interview is Layout 3, matched his preferred layout selection in the eye tracking experiment.

Table 18 shows the eye tracking video analysis of Participant 9.

Table 18 The Eye Tracking Video Analysis of Participant 9

Webpage-1 (Total = 3:00 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 2:23 Minutes)**
Area of Interest-1 (AOI-1)	**AOI-1**	**AOI-1**
P 9 started looking at all three layouts for 30 seconds.	P 9 started reading through Layout 3 (paragraph by paragraph by English on top), positioned on the	P 9 Started looking at Layout 2 (Arabic on the right and English on the left) for one minute.

AOI-2 P 9 started reading through the English text of Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen, for three minutes.	right hand corner of the screen. P 9 spent 2:00 minutes reading Layout 3 (paragraph by paragraph by English on top).	**AOI-2** P 9 started reading through Layout 3 (paragraph by paragraph by English on top) positioned in the left hand corner of the screen. P 9 spent 1:23 minutes reading Layout 3 (paragraph by paragraph by English on top).

A summarised analysis of Participant 10 is shown in Table 19.

Table 19 A Summarised Analysis of Participant 10

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 10 is male, international student, his age is in the range of 24-29, his English proficiency is Good, and he has been in New Zealand for more than one year. 2. P 10 has Internet at home, he uses English to browse the Internet, and he has been using the Internet for 10 years. 3. P 10 uses the Internet for email; Internet browsing; communicating with family overseas; news; ticket reservation; education; and entertainment. 4. P 10 uses e-government infrequently. 5. P 10 selected Layout 2 (Arabic on the right and English on the left) as his primary choice, and Layout 3 (paragraph by paragraph by English on top) as his second choice. 6. P 10 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 10 is not discouraged from accessing e-government. 8. P 10 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 10 did not participate in the online survey. 10. P 10 did not look up difficult English words in Arabic translation. 11. P 10 started reading the English text first on webpage-1, and then he started with reading the Arabic translation on webpage-2. 12. P 10 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen. 13. P 10 1st choice layout selection in the interview is Layout 2, matched his preferred layout selection in the eye tracking experiment.

Table 20 shows the eye tracking video analysis of Participant 10.

Table 20 The Eye Tracking Video Analysis of Participant 10

Webpage-1 (Total =1:55 Minutes)	**Webpage-2 (Total = 1:00 Minutes)**	**Webpage-3 (Total = 2:23 Minutes)**
Area of Interest-1 (AOI-1)	**AOI-1** P 10 started reading	**AOI-1** P 10 started reading

P 10 started reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand corner of the screen. He started reading the English text, it took him 55 seconds. Then he started reading the Arabic translation of Layout 2 **AOI-2** P 10 started reading through Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen. He read the English text first and it took him 1 minute.	through Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, this time he started reading the Arabic translation first. P 10 took 1:00 minute reading Layout 2.	through Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen for 2 minutes. **AOI** P 10 changed his AOI to Layout 3 (paragraph by paragraph by English on top) positioned on the left hand corner of the screen. P 10 took 23 seconds reading through Layout 3 (paragraph by paragraph by English on top).

A summarised analysis of Participant 11 is shown in Table 21.

Table 21 A Summarised Analysis of Participant 11

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 11 is male, international student, his age is in the range of 18-23, his English proficiency is Good, and he has been in New Zealand for 6 months. 2. P 11 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 7 years. 3. P 11 uses the Internet for email; Internet browsing; communicating with family overseas; news; ticket reservation; education; and entertainment. 4. P 11 does not use e-government. 5. P 11 selected Layout 2 (Arabic on the right and English on the left) as 1st choice and Layout 1 (sentence by sentence Arabic on top) as 2nd choice in the interview. 6. P 11 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 11 is discouraged from accessing e-government. 8. P 11 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 11 did not participate in the online survey. 10. P 11 did not look up difficult English words in Arabic translation. 11. P 11 started reading the Arabic text first on webpage-1, and then he started with reading the Arabic translation on webpage-2. 12. P 11 did not take very long time while doing the eye tracking experiment, he was distracted and he was fully concentrating on looking at the screen and using the mouse to read the text, but he was very concerned, because his eyes were looking in all directions as shown in the video. 13. P 11 1st choice layout selection in the interview is Layout 2, did not match his

preferred layout selection in the eye tracking experiment, which is Layout 1.

Table 22 shows the eye tracking video analysis of Participant 11.

Table 22 The Eye Tracking Video Analysis of Participant 11

Webpage-1 (Total = 1:45 Minutes)	**Webpage-2 (Total = 3:00 Minutes)**	**Webpage-3 (Total = 2:20 Minutes)**
Area of Interest-1 (AOI-1) P 11 started looking at Layout 1 (sentence by sentence Arabic on top) positioned in the left hand side corner of the screen for 20 seconds. **AOI-2** Then P 11 started reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand corner of the screen. He started reading the Arabic translation first, it took him 1:45 minutes. Then he started reading the English text of Layout 2.	**AOI-1** P 11 started reading through Layout 1 (sentence by sentence Arabic on top) for 3 minutes positioned in the middle of the screen.	**AOI-1** P 11 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the right hand corner of the screen. P 11 spent 2:20 minutes reading Layout 1 (sentence by sentence Arabic on top).

A summarised analysis of Participant 12 is shown in Table 23.

Table 23 A Summarised Analysis of Participant 12

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 12 is male, international student, his age is in the range of 30-35, his English proficiency is Excellent, and he has been in New Zealand for 3 weeks. 2. P 12 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 17 years. 3. P 12 uses the Internet for email; Internet browsing; communicating with family overseas; news; map directions; ticket reservation; employment; education; entertainment; and internet banking. 4. P 12 He uses e-government. 5. P 12 selected Layout 3 (paragraph by paragraph by English on top) as 1st choice, and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 12 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 12 is discouraged from accessing e-government. 8. P 12 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 12 did not participate in the online survey.

10. P 12 did not look up difficult English words in Arabic translation. 11. P 12 started reading the Arabic text first on webpage-1, and then he started with reading the Arabic translation on webpage-2. 12. P 12 did not take very long time while doing the eye tracking experiment, he was distracted and he was fully concentrating on looking at the screen and using the mouse to read the text, but he was very concerned, because his eyes were looking in all directions as shown in the video. 13. P 12 1st choice layout selection in the interview is Layout 3, matched his preferred layout selection in the eye tracking experiment.

Table 24 shows the eye tracking video analysis of Participant 12.

Table 24 The Eye Tracking Video Analysis of Participant 12

Webpage-1 (Total = 2:27 Minutes)	**Webpage-2 (Total = 2:05 Minutes)**	**Webpage-3 (Total = 2:20 Minutes)**
Area of Interest-1 (AOI-1) P 12 started looking at Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen and he started reading the English text first, and he took 2:27 minutes.	**AOI-1** P 12 started looking at the 3 layouts on webpage-2 for 13 seconds, and then he started reading Layout 3 (paragraph by paragraph by English on top) positioned on the left hand corner of the screen, and he started reading the English text first. P 12 took 1:52 minutes.	**AOI-1** P 12 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen. P 12 started reading the English text first; and it took him 1: 10 minutes. P 12 started reading the Arabic translation next. Of Layout 2. P 12 took 2:20 minutes reading Layout 2.

A summarised analysis of Participant 13 is shown in Table 25.

Table 25 A Summarised Analysis of Participant 13

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 13 is male, international student, his age is in the range of 30-35, his English proficiency is fair, and he has been in New Zealand for 1 month. 2. P 13 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 17 years. 3. P 13 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; education; internet banking; and entertainment. 4. P 13 uses e-government. 5. P 13 selected Layout 3 (paragraph by paragraph by English on top) as 1st choice and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 13 is more likely to browse e-government more if Paralingual websites are available, because it would improve his vocabulary and word translations. 7. P 13 is not discouraged from accessing e-government. 8. P 13 ticked the followings as the benefits of Paralingual websites: employment

search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information.
9. P 13 did not participate in the online survey.
10. P 13 did not look up difficult English words in Arabic translation.
11. P 13 started reading the Arabic text first on webpage-1, and then he started with reading the Arabic translation on webpage-2., but he started reading the English text on webpage-3.
12. P 13 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen and using the mouse to read the text.
13. P 13 1st choice layout selection in the interview is Layout 3, matched his preferred layout selection in the eye tracking experiment.

Table 26 shows the eye tracking video analysis of Participant 13.

Table 26 The Eye Tracking Video Analysis of Participant 13

Webpage-1 (Total = 2:07 Minutes)	**Webpage-2 (Total = 3:23 Minutes)**	**Webpage-3 (Total = 3:53 Minutes)**
Area of Interest-1 (AOI-1) P 13 started reading Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen and he started reading the Arabic translation first, and he took 57 seconds. Then P 13 started reading the English text, and he took 1:10 minutes.	**AOI-1** P 13 started reading Layout 2, he started reading the Arabic translation first, and took him 1:11 minutes. P 13 read the English text next, and it took him 2:12 minutes.	**AOI-1** P 13 started reading Layout 3 (paragraph by paragraph by English on top) positioned on the left corner of the screen, and he started reading the English text, and it took him 2:00 minutes. Then, P 13 started reading the Arabic translation; and it took him 1 minute. Then, P 13 went back to read the English text of Layout 3 (paragraph by paragraph by English on top), and it took him 53 seconds.

A summarised analysis of Participant 14 is shown in Table 27.

Table 27 A Summarised Analysis of Participant 14

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 14 is female, immigrant, her age is 40 and up, her English proficiency is excellent, and she has been in New Zealand for 7 years. 2. P 14 has Internet at home, she uses English and Arabic to browse the Internet, and she has been using the Internet for 14 years. 3. P 14 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; education; internet banking; and entertainment. 4. P 14 uses e-government every day. 5. P 14 selected Layout 3 (paragraph by paragraph by English on top) as 1st choice

and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview.
6. P 14 is not likely to browse e-government more if Paralingual websites are available, because she is ok with using it in English.
7. P 14 is not discouraged from accessing e-government.
8. P 14 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information.
9. P 14 did not participate in the online survey.
10. P 14 did not look up difficult English words in Arabic translation.
11. P 14 started reading the Arabic text first on webpage-1, and then he started with reading the Arabic translation on webpage-2., but he started reading the Arabic translation on webpage-3.
12. P 14 did not take very long time while doing the eye tracking experiment, she was not distracted and she was fully concentrating on looking at the screen and using the mouse to read the text.
13. P 14 1st choice layout selection in the interview is Layout 3, did not match her preferred layout selection in the eye tracking, which is Layout 2.

Table 28 shows the eye tracking video analysis of Participant 14.

Table 28 The Eye Tracking Video Analysis of Participant 14

Webpage-1 (Total = 3:00 Minutes)	**Webpage-2 (Total = 6:00 Minutes)**	**Webpage-3 (Total = 1:10 Minutes)**
Area of Interest-1 (AOI-1) P 14 started looking at all three layouts. **AOI-2** P 14 started reading Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen, and she started reading the English text first it took her 1:40 minutes. The P 14 started reading the Arabic translation, and it took her 1:20 minutes.	**AOI-1** P 14 started looking at all three layouts. **AOI-2** P 14 started reading through Layout 3 (paragraph by paragraph by English on top) positioned on the right hand corner of the screen , the English text first; it took her 1:10 minutes. **AOI-3** P 14 changed her AOI to Layout 2 (Arabic on the right and English on the left) starting with the Arabic translation first, and it took her 2:50 minutes. Then P 14 started reading the English text, it took 2 minutes.	**AOI-1** P 14 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and she started reading the Arabic translation, and it took her 1:10 minutes, then the English text.

A summarised analysis of Participant 15 is shown in Table 29.

Table 29 A Summarised Analysis of Participant 15

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 15 is male, international student, his age is in the range of 24-29, his English proficiency is good, and he has been in New Zealand for 4 years. 2. P 15 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 13 years. 3. P 15 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; education; internet banking; and entertainment. 4. P 15 uses e-government when needed. 5. P 15 selected Layout 2 (Arabic on the right and English on the left) as 1st choice and no 2nd choice selection in the interview. 6. P 15 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 15 is not discouraged from accessing e-government. 8. P 15 ticked the followings as the benefits of Paralingual websites: employment search; access e-government more often; creates trust in the government, could be used as an educational tool, and saves time when looking for important information. 9. P 15 did not participate in the online survey. 10. P 15 did not look up difficult English words in Arabic translation. 11. P 15 started reading the Arabic text first on webpage-1, and then he started with reading the Arabic translation on webpage-2., but he started reading the Arabic translation on webpage-3. 12. P 15 did not take very long time while doing the eye tracking experiment, she was not distracted and she was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 15 1st choice layout selection in the interview is Layout 2, matched his preferred layout selection during the eye tracking experiment.

Table 30 shows the eye tracking video analysis of Participant 15.

Table 30 The Eye Tracking Video Analysis of Participant 15

Webpage-1 (Total = 4:49 Minutes)	**Webpage-2 (Total = 4:00 Minutes)**	**Webpage-3 (Total = 3:00 Minutes)**
Area of Interest-1 (AOI-1) P 15 started reading Layout 2 (Arabic on the right and English on the left) positioned in the right hand side of the screen, he started reading the English text. While P 15 was reading Layout 2 (Arabic on the right and English on the left) he seemed as if he was looking at Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen	**AOI-1** P 15 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text. The eye tracker's camera captured P 15 looking normally at Layout 2, because this time the mouse tracking was matching the highlighted eye tracking square.	**AOI-1** P 15 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and he started reading the Arabic translation, and it took him 3 minutes. While P 15 was reading through Layout 2 (Arabic on the right and English on the left) positioned on the right hand corner of the screen the eye tracker was a little

captured by the eye tracking camera on the viewer, because his right eye is glass. So when he was looking on the right he was using his left eye to read, but the eye tracker camera reflected the gaze from glass right eye looking further left, because the mouse was pointing to the English text of Layout 2 (Arabic on the right and English on the left) where P 15 was reading.	P 15 took 3 minutes to read the English text of Layout 2. P 15 took 1 minute to read the Arabic translation.	off with the mouse tracker.

A summarised analysis of Participant 16 is shown in Table 31.

Table 31 A Summarised Analysis of Participant 16

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 16 is male, international student, his age is in the range of 24-29, his English proficiency is good, and he has been in New Zealand for 5 years. 2. P 16 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 13 years. 3. P 16 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; internet banking; and entertainment. 4. P 16 uses e-government when needed. 5. P 16 selected Layout 2 (Arabic on the right and English on the left) as his primary choice, and Layout 3 (paragraph by paragraph by English on top) as his secondary choice in the interview. 6. P 16 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 16 is not discouraged from accessing e-government. 8. P 16 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 16 did not participate in the online survey. 10. P 16 did not look up difficult English words in Arabic translation. 11. P 16 started reading the English text first on webpage-1, and then he started with reading the English text on webpage-2., but he started reading the English text on webpage-3. 12. P 16 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 16 1st choice layout selection in the interview is Layout 2, did not match his preferred layout selection in the eye tracking experiment, which is Layout 3.

Table 32 shows the eye tracking video analysis of Participant 16.

Table 32 The Eye Tracking Video Analysis of Participant 16

Webpage-1 (Total = 3:27 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 1:20 Minutes)**
Area of Interest-1 (AOI-1) P 16 started reading Layout 3 (paragraph by paragraph by English on top) positioned in middle of the screen, he started reading the English text, and it took him 2:27 minutes. P 16 started reading the Arabic translation, it took him 1 minute.	**AOI-1** P 16 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text.	**AOI-1** P 16 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and he started reading the English text.

A summarised analysis of Participant 17 is shown in Table 33.

Table 33 A Summarised Analysis of Participant 17

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 17 is male, international student, his age is in the range of 24-29, his English proficiency is good, and he has been in New Zealand for 4.5 years. 2. P 17 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 12 years. 3. P 17 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; internet banking; and entertainment. 4. P 17 does not use e-government. 5. P 17 selected Layout 2 (Arabic on the right and English on the left) as 1st choice and Layout 3 (paragraph by paragraph by English on top) as 2nd choice in the interview. 6. P 17 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 17 is discouraged from accessing e-government. 8. P 17 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 17 did not participate in the online survey. 10. P 17 did not look up difficult English words in Arabic translation. 11. P 17 started reading the English text first on webpage-1, and then he started with reading the English text on webpage-2., but he started reading the English text on webpage-3. 12. P 17 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 17 1st choice layout selection in the interview is Layout 2, matched his preferred layout selection in the eye tracking experiment.

Table 34 shows the eye tracking video analysis of Participant 17.

Table 34 The Eye Tracking Video Analysis of Participant 17

Webpage-1 (Total = 3:00 Minutes)	**Webpage-2 (Total = 2:00 Minutes)**	**Webpage-3 (Total = 2:51 Minutes)**
Area of Interest-1 (AOI-1) P 17 started reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand side of the screen, he started reading the Arabic translation, and it took him 1 minute. P 17 started reading The English text, it took him 2 minutes.	**AOI-1** P 17 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text, and it took him 1 minute. Then P 17 started reading through the Arabic translation of Layout 2, and it took him 1 minute.	**AOI-1** P 17 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and he started reading the English text, and it took him 1:51 minutes. Then P 17 started reading the Arabic translation, it took him 1 minute.

A summarised analysis of Participant 18 is shown in Table 35.

Table 35 A Summarised Analysis of Participant 18

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 18 is male, international student, his age is 40 and up, his English proficiency is fair, and he has been in New Zealand for 8 months. 2. P 18 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 10 years. 3. P 18 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; and entertainment. 4. P 18 uses e-government infrequently. 5. P 18 selected Layout 2 (Arabic on the right and English on the left) as 1st choice and no 2nd choice selection in the interview. 6. P 18 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 18 is not discouraged from accessing e-government. 8. P 18 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 18 did not participate in the online survey. 10. P 18 looked up difficult English words in Arabic translation. 11. P 18 started reading the Arabic translation first on webpage-1, and then he started with reading the English text on webpage-2., but he started reading the English text on webpage-3. 12. P 18 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 18 1st choice layout selection in the interview is Layout 2, matched his preferred layout selection in the eye tracking experiment.

Table 36 shows the eye tracking video analysis of Participant 18.

Table 36 The Eye Tracking Video Analysis of Participant 18

Webpage-1 (Total = 1:25 Minutes)	**Webpage-2 (Total = 1:10 Minutes)**	**Webpage-3 (Total = 2:15 Minutes)**
Area of Interest-1 (AOI-1) P 18 started reading Layout 3 (paragraph by paragraph by English on top) positioned in middle of the screen, he started reading the English text, and it took him 10 seconds. **AOI-2** P 18 started reading The English text of Layout 2, it took him 1:25 minutes. P 18 looked up the translation of English words in Arabic, three times.	**AOI-1** P 18 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the English text, and it took him 1:10 minutes.	**AOI-1** P 18 started reading Layout 3 (paragraph by paragraph by English on top) positioned on the left hand corner of the screen, and he started reading the English text, and it took him 2:15 minutes. Then P 18 looked up the translation of English words in Arabic.

A summarised analysis of Participant 19 is shown in Table 37.

Table 37 A Summarised Analysis of Participant 19

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 19 is female, international student, her age is in the range 18-23, her English proficiency is good, and she has been in New Zealand for 9 months. 2. P 19 has Internet at home, she uses English and Arabic to browse the Internet, and she has been using the Internet for 7 years. 3. P 19 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; and entertainment. 4. P 19 does not use e-government. 5. P 19 selected Layout 2 (Arabic on the right and English on the left) as 1st choice and no 2nd choice selection in the interview. 6. P 19 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 19 is discouraged from accessing e-government. 8. P 19 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 19 did not participate in the online survey. 10. P 19 did not look up difficult English words in Arabic translation. 11. P 19 started reading the English text first on webpage-1, and then she started with reading the Arabic translation on webpage-2., but she started reading the Arabic translation on webpage-3. 12. P 19 did not take very long time while doing the eye tracking experiment, she was not distracted and she was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 19 1st choice layout selection is Layout 2 in the interview, matched her

preferred layout selection during the eye tracking experiment.

Table 38 shows the eye tracking video analysis of Participant 19.

Table 38 The Eye Tracking Video Analysis of Participant 19

Webpage-1 (Total = 1:56 Minutes)	**Webpage-2 (Total = 4:10 Minutes)**	**Webpage-3 (Total = 2:00 Minutes)**
Area of Interest-1 (AOI-1) P 19 started reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand corner of the screen, she started reading the English text, and it took her 1:56 minutes. P 19 looked up the translation of English words in Arabic, four times.	**AOI-1** P 19 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and he started reading the Arabic translation first and then she was reading across the English text. P 19 looked up the translation of English words in Arabic, three times.	**AOI-1** P 19 started reading Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, and she started reading the Arabic translation, and it took her 2:00 minutes. Then P 19 looked up the translation of English words in Arabic two times.

A summarised analysis of Participant 20 is shown in Table 39.

Table 39 A Summarised Analysis of Participant 20

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 20 is female, international student, her age is in the range 30-35, her English proficiency is good, and she has been in New Zealand for 8 months. 2. P 20 has Internet at home, she uses English and Arabic to browse the Internet, and she has been using the Internet for 10 years. 3. P 20 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; and entertainment. 4. P 20 uses e-government infrequently. 5. P 20 selected Layout 1 (sentence by sentence Arabic on top) as 1st choice, and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 20 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 20 is not discouraged from accessing e-government. 8. P 20 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 20 did not participate in the online survey. 10. P 20 did not look up difficult English words in Arabic translation. 11. P 20 started reading the Arabic translation first on webpage-1, and then she started with reading the Arabic translation on webpage-2., but she started reading the Arabic translation on webpage-3. 12. P 20 did not take very long time while doing the eye tracking experiment, she was not distracted and she was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 20 1st choice layout selection is Layout 1 in the interview, matched her

preferred layout selection during the eye tracking experiment.

Table 40 shows the eye tracking video analysis of Participant 20.

Table 40 The Eye Tracking Video Analysis of Participant 20

Webpage-1 (Total = 1:56 Minutes)	**Webpage-2 (Total = 1:45 Minutes)**	**Webpage-3 (Total = 1:40 Minutes)**
Area of Interest-1 (AOI-1) P 20 started reading Layout 1 positioned on the left hand side corner of the screen, she started reading the Arabic translation, and it took her 1:56 minutes.	**AOI-1** P 20 started reading Layout 1 (sentence by sentence Arabic on top) positioned in the middle of the screen, and she started reading the Arabic translation first and then she was reading the English text beneath it.	**AOI-1** P 20 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and she started reading the Arabic translation, and it took her 1:40 minutes.

A summarised analysis of Participant 21 is shown in Table 41.

Table 41 A Summarised Analysis of Participant 21

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 21 is female, immigrant, her age is 40 and up, her English proficiency is excellent, and she has been in New Zealand for 16 years. 2. P 21 has Internet at home, she uses English and Arabic to browse the Internet, and she has been using the Internet for 16 years. 3. P 21 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; and entertainment. 4. P 21 uses e-government infrequently. 5. P 21 selected Layout 1 as 1st choice and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 21 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 21 is not discouraged from accessing e-government. 8. P 21 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 21 participated in the online survey. 10. P 21 did not look up difficult English words in Arabic translation. 11. P 21 started reading the Arabic translation first on webpage-1, and then she started with reading the English text on webpage-2, but she started reading the Arabic translation on webpage-3. 12. P 21 did not take very long time while doing the eye tracking experiment, she was not distracted and she was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 21 1st choice layout selection is Layout 1 in the interview, matched her preferred layout selection in the eye tracking experiment.

Table 42 shows the eye tracking video analysis of Participant 21.

Table 42 The Eye Tracking Video Analysis of Participant 21

Webpage-1 (Total = 1:30 Minutes)	**Webpage-2 (Total = 2:30 Minutes)**	**Webpage-3 (Total = 1:20 Minutes)**
Area of Interest-1 (AOI-1) P 21 started reading Layout 1 positioned on the left hand side corner of the screen, she started reading the Arabic translation, and it took her 1:30 minutes.	**AOI-1** P 21 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand corner of the screen, and she started reading the English text first and then she was reading the English text next to it, and it took her 1:53 minutes. **AOI-2** P 21 changed her AOI to Layout 1 (sentence by sentence Arabic on top), and took her 37 seconds.	**AOI-1** P 21 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and she started reading the Arabic translation, and it took her 1:20 minutes.

A summarised analysis of Participant 22 is shown in Table 43.

Table 43 A Summarised Analysis of Participant 22

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 22 is a male, international student, his age is in the range of 18-23, his English proficiency is excellent, and she has been in New Zealand for 3.5 years. 2. P 22 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 8 years. 3. P 22 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; and entertainment. 4. P 22 does not use e-government. 5. P 22 selected Layout 3 as 1st choice, and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 22 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 22 is discouraged from accessing e-government. 8. P 22 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 22 participated in the online survey. 10. P 22 did not look up difficult English words in Arabic translation. 11. P 22 started reading the Arabic translation first on webpage-1, and then he started with reading the English text on webpage-2, but he started reading the Arabic translation on webpage-3. 12. P 22 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen and using the

mouse to read the text. 13. P 22 1st choice layout selection is Layout 3 in the interview matched his preferred layout selection in the eye tracking experiment.

Table 44 shows the eye tracking video analysis of Participant 22.

Table 44 The Eye Tracking Video Analysis of Participant 22

Webpage-1 (Total = 3:25 Minutes)	**Webpage-2 (Total = 1:57 Minutes)**	**Webpage-3 (Total = 2:04 Minutes)**
Area of Interest-1 (AOI-1) P 22 started reading Layout 1 positioned on the left hand side corner of the screen, he started reading the Arabic translation, and it took him 1:45 minutes. **AOI-2** P 22 changed his AOI to reading Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen; it took him 1:40 minutes.	**AOI-1** P 22 started reading Layout 3 (paragraph by paragraph by English on top) positioned on the right hand corner of the screen, and he started reading the English text first and then he was reading the English text beneath it, and it took him 1:57 minutes.	**AOI-1** P 22 started reading Layout 1 (sentence by sentence Arabic on top) positioned on the right hand side of the screen, and he started reading the Arabic translation, and it took him 1:04 minutes. **AOI-2** P 22 changed his AOI to Layout 3 (paragraph by paragraph by English on top), and it took him 1 min.

A summarised analysis of Participant 23 is shown in Table 45.

Table 45 A Summarised Analysis of Participant 23

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 23 is a male, international student, his age is in the range of 18-23, his English proficiency is excellent, and she has been in New Zealand for 2 years. 2. P 23 has Internet at home, he uses English and Arabic to browse the Internet, and he has been using the Internet for 8 years. 3. P 23 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; and entertainment. 4. P 23 uses e-government infrequently. 5. P 23 selected Layout 3 (paragraph by paragraph by English on top) as 1st choice, and Layout 2 (Arabic on the right and English on the left) as 2nd choice in the interview. 6. P 23 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 23 is not discouraged from accessing e-government. 8. P 23 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 23 did not participate in the online survey. 10. P 23 did not look up difficult English words in Arabic translation. 11. P 23 started reading the Arabic translation first on webpage-1, and then he started with reading the English text on webpage-2, but he started reading the English text on webpage-3. 12. P 23 did not take very long time while doing the eye tracking experiment, he was

not distracted and he was fully concentrating on looking at the screen and using the mouse to read the text. 13. P 23 1st choice layout selection is Layout 3 in the interview, matched his preferred layout selection during the eye tracking experiment.

Table 46 shows the eye tracking video analysis of Participant 23.

Table 46 The Eye Tracking Video Analysis of Participant 23

Webpage-1 (Total = 4:35 Minutes)	**Webpage-2 (Total = 2:20 Minutes)**	**Webpage-3 (Total = 3:20 Minutes)**
Area of Interest-1 (AOI-1) P 23 started reading Layout 1 positioned on the left hand side corner of the screen, he started reading the Arabic translation, and it took him 1:25 minutes. **AOI-2** P 23 changed his AOI to reading Layout 3 (paragraph by paragraph by English on top) positioned in the middle of the screen; it took him 3:10 minutes.	**AOI-1** P 23 started reading Layout 3 (paragraph by paragraph by English on top) positioned on the right hand corner of the screen, and he started reading the English text first and then he was reading the Arabic translation beneath it, and it took him 2:20 minutes.	**AOI-1** P 23 started reading Layout 3 (paragraph by paragraph by English on top) positioned on the left hand side of the screen, and he started reading the English text, and it took him 3:20 minutes.

A summarised analysis of Participant 24 is shown in Table 47.

Table 47 A Summarised Analysis of Participant 24

Based on the Results from the Eye Tracking Experiment & the Interview
1. P 24 is a male, international student, his age is in the range of 18-23, his English proficiency is excellent, and she has been in New Zealand for 1 years. 2. P 24 has Internet at home, he uses English to browse the Internet, and he has been using the Internet for 8 years. 3. P 24 uses the Internet for email; Internet browsing; communicating with family overseas; news; map direction; ticket reservation; legal information; employment; and entertainment. 4. P 24 does not use e-government. 5. P 24 selected Layout 2 (Arabic on the right and English on the left) as 1st choice, and Layout 3 (paragraph by paragraph by English on top) as 2nd choice in the interview. 6. P 24 is likely to browse e-government more if Paralingual websites are available, because he it would be easier to use and understand. 7. P 24 is discouraged from accessing e-government. 8. P 24 ticked the followings as the benefits of Paralingual websites; access e-government more often; creates trust in the government; and saves time when looking for important information. 9. P 24 did not participate in the online survey. 10. P 24 looked up difficult English words in Arabic translation. 11. P 24 started reading the Arabic translation first on webpage-1, and then he started with reading the English text on webpage-2, but he started reading the English text on

webpage-3.
12. P 24 did not take very long time while doing the eye tracking experiment, he was not distracted and he was fully concentrating on looking at the screen and using the mouse to read the text.
13. P 24 1st choice layout selection is Layout 2 in the interview, matched his preferred layout selection in the eye tracking experiment.

Table 48 shows the eye tracking video analysis of Participant 24.

Table 48 The Eye Tracking Video Analysis of Participant 24

Webpage-1 (Total = 1:44 Minutes)	**Webpage-2 (Total = 1:25 Minutes)**	**Webpage-3 (Total = 2:10 Minutes)**
Area of Interest-1 (AOI-1) P 24 started reading Layout 1 positioned on the left hand side corner of the screen, he started reading the Arabic translation, and it took him 24 seconds. **AOI-2** P 24 changed his AOI to reading Layout 2 (Arabic on the right and English on the left) positioned on the right hand side of the screen; started reading the English text, and it took him 1:20 minutes. P 24 looked up translation of English words in Arabic two times.	**AOI-1** P 24 started reading Layout 2 (Arabic on the right and English on the left) positioned on the left hand side corner of the screen, and he started reading the English text first, and it took him 1:25. P 24 looked up translation of English words in Arabic one time.	**AOI-1** P 24 started reading Layout 3 (paragraph by paragraph by English on top) positioned on the left hand side of the screen, and he started reading the English text, and it took him 33 seconds. **AOI-2** P 24 changed his AOI to Layout 2 (Arabic on the right and English on the left) positioned in the middle of the screen, he started reading the English text, and it took him 1:37 minutes. P 24 looked up translation of English words in Arabic three times.

Appendix R Project Timeline of the Major Milestones to be Achieved

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Localization Provision in NZ: Arabic Speakers' Preference for Different Paralingual webpage Layouts