School of Linguistics, Adult and Specialist Education
Faculty of Business, Education, Law and Arts

UNDERSTANDING HOW OLDER AUSTRALIANS EXPERIENCE INFORMATION LITERACY USING MOBILE DEVICES

A Thesis submitted by
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Abstract

This thesis reports on a Constructivist Grounded Theory study that investigated older Australians' information literacy experience using mobile devices in their daily lives. A growing number of studies have revealed that information literacy is an important concept for older adults, and that considerably more work exploring the phenomenon is needed. While previous studies explored how older adults experienced information literacy, they did not focus on this phenomenon in the context of mobile devices. We live in, not just an information age, but also a technological age. Thus, this research project explores the following research question: *How do older Australians experience information literacy using mobile devices?*

Emanating from this proposed research question, the study's objectives are: to contribute new knowledge (i.e., a new theoretical understanding) about how older adults experience information literacy using mobile devices; and to explore what this new knowledge may contribute to information literacy education and consumer information research using mobile devices. The findings may be used to support the information needs of older Australians.

This research adopts the Constructivist Grounded Theory method. Australians aged 65 years of age or older who use mobile devices were invited to take part in an in-depth, semi-structured interview. Twelve older Australians living in a regional town in Queensland participated in interviews. The participants conversed in-person about how they use their smartphone and/or tablet computer as part of their information literacy experience in their everyday lives.

The outcome of this study is a substantive theory named Older Australians' Mobile Information Literacy: A Grounded Theory, which provides a holistic view of older Australians' information literacy experience using mobile devices. This theory consists of 6 categories, which are interconnected and were constructed through a Constructivist Grounded Theory analysis process. These categories are: *Ageing*; *Learning to use and manage mobile devices*; *Being entertained*; *Enacting everyday life*; *Learning*; and *Managing relationships*.

This work is of interest to the domains of information literacy, to mobile devices (including building and devising them for the seniors market), to library and information sciences and to information literacy community education research. It also contributes to our understanding of older Australians and their use of technology. Further, this study adds new understanding about older adults' engagement with information using mobile devices in their everyday life. This research contributes to the expansion of information literacy research from a socio-cultural perspective in a community context, with new knowledge and understanding about how older adults experience information literacy and how their information literacy experiences are socially and culturally influenced by their interactions within that community.

Keywords

Information literacy, older adults, information, mobile devices, Constructivist Grounded Theory, smartphones, tablet computers, experiences of information literacy.

Certification of thesis

This Thesis is entirely the work of Gema Linares Soler except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

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Table of contents

List of tables

List of figures

1 Introduction

1.1 Introduction

Older adults experience diverse age-related changes as a result of the ageing process (Harman 1981). These changes impact on the development of their everyday lives and on their quality of life (Borglin, Edberg & Hallberg 2005). Simultaneously, mobile devices, smartphones and tablets have become a feature of today's society, and have transformed the way older adults live and deal with their daily tasks (Plaza et al. 2011). These devices provide a wide range of services and apps which can be used for multiple purposes, such as to communicate with others, to get information, to do the shopping or to control their health, at any time and from anywhere (Xu et al. 2011). All these services and apps can improve and support the lives of older adults, make easier the ageing process and provide them significant benefits, enabling them to be more social and active, and allowing them to live with greater independence (Plaza et al. 2011). Therefore, mobile devices have become new tools by which older adults experience information literacy through their engagement with information as part of the enactment of their everyday lives. Seminal studies have revealed that the active use of information has been associated with successful aging, making information literacy an important concept for older adults (Asla, Williamson & Mills 2006; Niemelä, Huotari & Kortelainen 2012; Asla & Williamson 2013). This thesis outlines a research project that explores a new object of study in information literacy research: the information literacy experience of older adults using mobile devices.

In this Introduction chapter, I outline the context for the research study. I describe the background of the research problem and research question, and provide an overview of the methodology used for this research study. In addition, I discuss the significance of the research and the contributions of this study. Finally, I conclude with definitions of key terms and concepts, and provide an overview of the organisation of this thesis.

1.2 Background to the study

The report titled *An Ageing Australia: Preparing for the Future*, states that the Australian population is ageing (Australian Government, Productivity Commission 2013). According to the report titled *Global Age Watch Index 2015*, the percentage of Australians over 65 is set to increase significantly by 2030 (HelpAge International 2015). This ageing has considerable impact on social, economic, political, and health care institutions (Huber & Watson 2014).

Given Australia's ageing population and the omnipresence of new technologies in everyday life, the use of Internet and information and communication technologies (ICT) for older adults is essential (Boulton-Lewis et al. 2007). However, Chesters, Ryan and Sinning, claim that 65% of men and 73% of women aged 65 years or more have never used the Internet to read or send emails (Chesters, Ryan & Sinning 2013). This data suggests that there is a generational digital divide to be overcome. The Australian Government report titled *Older Australians and the Internet: Bridging the Digital Divide* explored how older Australians who never or rarely use the Internet know about the types of online products and services available to them (Australian Government, Department of Health and Ageing 2011). Also, it investigated how they might use online products and services to improve their daily lives (Australian Government, Department of Health and Ageing 2011). The Internet can provide older people with avenues for learning, networking, and participating in civic or political causes. It also enables them to access e-health, e-banking and e-shopping services. By using technologies, they can stay in contact with their families or friends, expand their social contact and minimise the feeling of loneliness; also, they can access information without any other help and learn new things. According to the report *Older Australians and the Internet: Bridging the Digital Divide*, the barriers to Internet use that exist for the over 50s are identified as: geographical, financial or physical constraints, illness, the inability to use online resources or lack of skills, no time or interest, and concerns about information security.

Many people use mobile devices, such as smartphones and tablets, in their daily lives (Global Web Index 2017). The report titled *Australians' Digital Lives* states that in 2014, those aged 65 and over, more than 700,000 people (22% of older adults) went

online using a tablet, an increase of four percentage points on the previous reporting period (Australian Communications and Media Authority (ACMA) 2015). Mobile devices offer benefits that may be especially valuable to older adults. The simplicity, portability, and multi-functionality of mobile devices provide a viable alternative to desktop computers for older adults. Mobile devices can provide tools to older adults such as applications for connecting with loved ones, accessing contact information, browsing Internet content, and playing games. In addition, mobile devices may help older adults remain independent and maintain their quality of life (Leung et al. 2012).

1.3 The research problem and the research question

Research suggests that the digital divide is increasing in Australia, particularly for older adults (Torrisi & Messina 2013; COTA Australia 2012). When older adults do not have the knowledge that should allow them to access and use new technologies in order to access information, they are unable to take part in the information society (Morris 2007). Acquiring basic skills in the use of ICT and knowing the basic functions of current IT applications on mobile devices could allow older adults to use networks like the Internet and to access the resources that these technologies offer them (Juznic et al. 2006; Kumar et al. 2013). Such technologies are defined by Beal (2018) as Internet applications that run on smartphones and other mobile devices such as tablets. These apps range from health to entertainment. Some examples are:

- WebMD: This app can work as a handy guide for medical emergencies.
- Silver Surf: This app increases the size of the navigation buttons and makes it easier for older users with less dexterity in their fingers. It also has an Interactive Text Zoom slider that enlarges text up to 200 percent.
- Clevermind: This app includes quizzes and games, big buttons, voice command controls and a calendar interface, and helps people dealing with cognitive impairments associated with Alzheimer's Disease and other forms of dementia.
- FlipBoard: This app connects with all social media accounts, and connects with some of the best news and content sites that are interesting to older adults. It turns everything into a digital magazine, which enables they "flip" the pages and see everything set up like a magazine, including Facebook posts and tweets.

- Skype: This app allows them to talk to and see loved ones in a video conference.

For older adults, these apps potentially provide ways of integrating into the information society, experiencing social inclusion and improving their quality of life (Boulton-Lewis et al. 2007; Tiberio, Scopelliti & Giuliani 2011).

The Thompson, Griffin and Bowman Report (2013), titled *The Ageing Population. New Opportunities for Adult and Community Education*, discusses the need for diverse educational policies in order to encourage older adults to learn how to use mobile devices and be active contributors to the economy and society. In order to develop these educational policies, firstly, it is necessary to understand how older adults access, use and share information using these devices. Thus, within this context, information literacy could be considered crucial in order to help older adults acquire the skills and basic knowledge which allows them to access and make use of information services using mobile devices. For the purpose of this study, information literacy is defined as 'the ability to know what there is in a landscape and to draw meaning from this through engagement and experience with information' (Lloyd 2006, p. 570). Information literacy is seen as the critical understanding of how older adults use and engage with information within community context.

This study responds to the following research question: *How do older Australians experience information literacy using mobile devices?* Emanating from the research question, the study's objectives are identified as:

- To contribute new knowledge (i.e., a new theoretical understanding) about how older adults experience information literacy using mobile devices.
- Grounded in the new knowledge, to explore what this may provide to information literacy education and consumer information research using mobile devices, supporting the information needs of older Australians.

1.4 Methodology: Constructivist Grounded Theory

I adopted the Social Constructivist Grounded Theory as the methodological framework because this version of Grounded Theory generates or discovers a theory for a process or an action, with strong supporting data, and it focuses on participant

perspectives. This approach provided a firm basis for understanding the experiences of older adults using and engaging with information using mobile devices.

This perspective of Grounded Theory was advocated by the sociologist Kathy Charmaz in 2006. Constructivists take the view that knowledge is constructed by individuals (in the context of this study, older adults) in a social context and that researchers do not merely report research findings but interpret the research participants' construction of reality. Constructivist Grounded Theory, as a methodology, aligns with the aims of the research study which is to provide understanding of the diverse described experiences of using and engaging with information using mobile devices (the phenomenon) by participants in the study. According to this approach, theory is grounded in the views of participants and allows the explanation of the feelings of individuals as they experience a phenomenon or process. Participants were recruited using existing contacts and data were collected using face-to-face semi-structured in-depth interviews.

Constructivist Grounded Theory has previously been used in a number of research studies to explore and understand information literacy, as well as the complex social relationships that exist in a community with technologies. Constructivist Grounded Theory has demonstrated its value and effectiveness as a research approach for providing a suitable platform for research into what it means to be information literate and how information literacy is made manifest in a community of practice. In summary, I considered Constructivist Grounded Theory to be a suitable research approach through which to explore the various ways information literacy is experienced by older adults using mobile devices in everyday life. Further detail on the research methodology and its suitability for this study is provided in Chapter 3.

1.5 Key findings

The outcome of this study is the construction of a new theory, which shows how information literacy is experienced by older Australians through the use of mobile devices. I named this theory Older Australians' Mobile Information Literacy: A Grounded Theory. The theory reveals that older Australians' information literacy experience using mobile devices is an intricate phenomenon, and its main aspects

and characteristics involve three components (older adults, mobile devices and information literacy), comprising 6 categories: *Ageing*; *Learning to use and manage mobile devices*; *Being entertained*; *Enacting everyday life*; *Learning*; and *Managing relationships*.

The Grounded Theory of this study and its categories and relationships between them are described and discussed in detail in Chapter 5.

1.6 Significance and contributions of the research

This study provides an original contribution to both practice and theory of information literacy research, with new knowledge and understanding about older adults' engagement with information using mobile devices in their everyday lives. It is of interest to the following research domains: library and information science, information literacy community education and mobile devices.

1.6.1 Contribution to theory

The most important contribution to knowledge from this research is the construction of a new theory about the experience of information literacy by older adults using mobile devices, named Older Australians' Mobile Information Literacy: A Grounded Theory. This study explores the phenomenon of older adults' information literacy experience using mobile devices, contributing to the understanding of the phenomenon of information literacy experience using mobile devices.

Further, as information literacy is contextualized within the Library and Information Science field, a primary contribution of this research is to Library and Information Science theory through the articulation of a new conceptual understanding of information literacy. It explores the information literacy experience of a particular group (older adults) using mobile devices, contributing to the theoretical discussion about information literacy experience as a research domain.

In short, this study contributes by adding new theoretical knowledge about how older adults experience information literacy using mobile devices which hasn't been explored in depth previously. This new knowledge may help to guide the

development of information literacy education, and information services and products using mobile devices, to support the information literacy needs of older Australians.

1.6.2 Contribution to information literacy research

This research contributes to the expansion of information literacy research, as to date there have been few research studies in which information literacy is explored from a socio-cultural perspective and in a community context. This study provides not just a better understanding of information practices of older adults, as a community, but also how their information practices are socially and culturally influenced by their interactions within that community.

1.6.3 Contribution to library and information science practice

This research study is contextualized in the Library and Information Science field. Therefore, this research makes an original contribution to library and information studies. It adds new understanding about older adults' engagement with information using mobile devices in their everyday life. The findings may be used to inform the way information services and products aimed at supporting the information needs of older Australians are developed and delivered in library and information services, including training and education programs.

1.6.4 Contribution to information literacy community education

The findings of this research can be used to guide the development of information literacy education services and products using mobile devices, to support the information literacy needs of older Australians. An improved understanding of older adults' contexts enables the creation of customized and personalised instruction and support services.

1.6.5 Contribution to mobile devices research

This research study contributes with new knowledge about how older adults engage with information using mobile devices in their daily lives by exploring their concerns, difficulties and needs. Hence, the results of this research can help professionals and designers of mobile devices to create and design mobile apps and services which facilitate older adults' adoption, adaptation and usage of mobile devices in their everyday lives.

1.7 Key concepts

In the following section I provide brief definitions of key concepts which are of relevance to this research. I also establish how these concepts are interpreted in the framework of this research study.

1.7.1 Information literacy

Information literacy is the central focus of the study. It is a domain of research positioned as part of the Library and Information Science field. This term was first coined in 1974 by Paul Zurkowski, who stated that an information literate individual was someone 'who had learned to use a wide range of information sources in order to solve problems at work and in his or her daily life' (Grassian & Kaplowitz 2001, p.4). Since 1974 there has been a growing number of studies exploring information literacy from different theoretical perspectives and within different contexts.

In this study, information literacy is explored within a community context, by focusing on understanding the information literacy experience of older adults engaged in their everyday life. Information literacy is seen as the critical understanding of how to use and engage with information within specific contexts (Tuominen, Savolainen & Talja 2005; Lloyd 2006).

Further, this study embraces a socio-cultural perspective of information literacy. As such, it interprets the concept of information literacy as a social and cultural practice that is socially constructed by those participating in the everyday life of the community (Lloyd 2006). A socio-cultural perspective of information literacy sees

people's use of information as inseparable from the tools that are an integral part of social practices (Limberg, Sundin & Talja 2012, p.95). Hence, according to Limberg, Sundin and Talja (2012) information literacy refers to purposeful information practices in a society, where unlimited access to information and information practices throughout the use of digital environments constitute important elements in most people's lives in today's society. From a socio-cultural perspective, information literacy implies learning in order to participate in activities in everyday life. People need to learn to access, find, work with and use information, and also to be able to use tools (such as tablets and smartphones, in the case of this study) that enable them to carry out these information practices. Limberg, Sundin and Talja (2012) state that 'within a socio-cultural perspective, people's activities should be studied in relation to the tools through which the activities take place and based in the social practices where the activities are carried out' (Limberg, Sundin & Talja 2012, p. 107). Thus, this perspective aims to research and understand how people experience information literacy within their socio-cultural environment using mobile devices. Lloyd (2012) claims that this perspective allows us to understand what people do through their information practices and why they do it. As a result, it allows us to understand why and how information literacy is experienced in different ways according to specific contexts.

1.7.2 Information

In this study, the concept of information is taken to denote anything that an individual may experience as informing (Bruce 2008). This study also accepts that what is constituted as information is fundamentally linked to the context in which the users' experience with information takes place (Bruce 2008).

1.7.3 Ageing

Ageing is defined as a biological process of growing older in which physical, functional, psychological, and social changes are produced throughout the course of life (Hooyman & Kiyak 2008).

1.7.4 Older adults

According to Australian Bureau of Statistics (ABS 2012), in its document titled *Who are Australia's older people?,* older adults are considered to be people aged 65 years or over. This definition was used in this study.

1.7.5 Mobile devices

This study considers mobile devices to be technology such as tablets and smartphones. Viswanathan (2017) suggests that mobile devices include personal digital assistants (PDAs), smartphones, tablet computers, e-readers and portable music players with smart capabilities. Thus, smartphones and tablets are types of mobile devices and are defined as follows:

- Smartphones are handheld devices that combine mobile phone capabilities with basic features that are found in a handheld computer or a personal digital assistant (Beal 2014).
- Tablet computers are defined according to Balaji (2014) as flat touch screen devices, like slates, used to interact with digital content with fingers, unlike a traditional personal computer that uses a keyboard and a mouse.

1.8 Overview of this thesis

In this chapter, I introduced the research by providing the background of the study, articulating the research problem and the research question, and outlining the study's significance. Also, I presented key concepts relevant to this study.

In Chapter 2: Preliminary literature review, I provide an overview of the literature that examines research about older adults and their relationship with new and emerging technologies, and information literacy research within three contexts and from three different perspectives. I also introduce the concepts of older adults, information literacy, and new and emerging technologies. I focus this research primarily on this group's use and engagement with information through the use of new technologies in their everyday life. In summary, I review the literature in order to provide a critical examination of existing research and to position this study within

the research discipline. Finally, I reveal the gaps in the literature that this study seeks to address.

Chapter 3: Research methodology outlines the research methodology used for the study. I situate the study within the interpretivist research paradigm and discuss Constructivist Grounded Theory as the selected research approach. I also describe the research design, including the study's participants, the interview procedure, and strategies followed for data collection and analysis.

In Chapter 4: Research participants, the profiles of research the participants who took part in this study and a profile of myself as the researcher are provided. In Constructivist Grounded Theory, it is important to introduce not just the research participants but also the researcher because the theory and the research meaning are co-constructed by the researcher and the participants of the study.

Chapter 5: Findings presents the findings from this study. I present the new Grounded Theory of older Australians' information literacy experience using mobile devices named as Older Australians' Mobile Information Literacy: A Grounded Theory. In addition, I describe the foundational concepts and characteristics of the research phenomenon, and introduce its six categories.

Finally, Chapter 6: Discussion and conclusion provides a summary of the research findings, which are critically discussed, and explores the contribution of this research to theory and practice. Also, I discuss the limitations of this study. Lastly, I conclude by offering future research directions.

1.9 Conclusion

In this chapter I have introduced the study. I have outlined the background of the research problem and research question. Also, I have provided an overview of the methodology used for this research study. In addition, I discussed the significance of the research and the contributions of this study. Finally, I concluded with the definitions of key terms and concepts, and an overview of the organisation of this thesis. In the next chapter I will present a preliminary literature review on

information literacy, and also on older adults and their relationship with new and emerging technologies.

2 Preliminary literature review

2.1 Introduction

I call this chapter a "preliminary literature review" because it explores the literature of relevance to the study, that I reviewed prior to my Confirmation of PhD Candidature presentation in March 2016. In keeping with Grounded Theory principles, which suggest setting the literature aside in order to ensure results are not influenced by it, I stopped looking at the literature while I undertook data collection and analysis. When I completed data collection and analysis I returned to the literature to explore new research that had been published after my Confirmation. The key findings from this return to the literature are presented in the discussion and conclusion chapter, where I specifically explore the published literature related to my findings. I explain the role of the literature review in Grounded Theory in more detail in the following section.

In order to explore the research of relevance to the present study, I divide the areas of this research in two sections: Information Literacy and Older Adults. In the first section, I examine information literacy within three contexts and from three different perspectives. This will enable a better understanding of which context and perspective is the most suitable according to the object of the research. In the next section, I provide an overview of older adults and their relationship with new and emerging technologies in today's society. This literature review demonstrates the lack of research that addresses the information literacy of older adults in the context of new technologies. Finally, I identify and explain the research gaps to be addressed, and I describe the relevance and contribution of the current study in a conclusion section.

2.2 The role of the literature review in Grounded Theory

In most research studies, a literature review precedes data collection and analysis, as it helps the researcher to contextualise the research within existing knowledge

(Creswell 2013). However, in Grounded Theory research, there is some debate about conducting a literature review prior to data collection and analysis, which primarily relates to the questions of when, where and how the literature should be used (Glaser & Strauss 1967; Strauss & Corbin 1990). Glaser and Strauss (1967) affirm that researchers should start research with an open mind and avoid preconceptions, while Charmaz (2006, p.166) considers that the 'literature review can serve as an opportunity to set the stage for what you do in subsequent sections or chapters and analyse the most significant works in relation to what the researcher addressed in his/her now developed Grounded Theory'. According to the principles of Constructivist Grounded Theory, I include in this research a preliminary literature review to confirm that information literacy is an appropriate phenomenon to study within the context of older adults and mobile devices. It will also allow the development of initial theoretical understandings of this phenomenon.

2.3 Information literacy

The term information literacy was first coined in 1974 by Paul Zurkowski, in a proposal to the United States National Commission on Libraries and Information Science. He stated that an information literate individual was someone 'who had learned to use a wide range of information sources in order to solve problems at work and in his or her daily life' (Grassian & Kaplowitz 2001, p. 4). One of the most commonly cited definitions of information literacy is one provided by the American Library Association in 1989 which proposed: 'To be information literate, a person must be able to recognize when information is needed, and have the ability to locate, evaluate and use effectively the needed information' (American Library Association 1989, p. 1).

In the following sections, I point out relevant political declarations where information literacy is considered a concern to all sectors of society. In addition, I discuss the different theoretical perspectives in which information literacy has been defined. and the contexts where this term has been researched. Finally, I explain the main reasons why information literacy plays a crucial role for older adults according to significant studies.

2.3.1 Theories of information literacy

There are diverse definitions of information literacy (Aharony & Bronstein 2014). Thus, information literacy is a concept with a multitude of understandings. Furthermore, researches have defined this term from different theoretical perspectives: behavioural, relational and socio-cultural. I explain these different theoretical perspectives below.

2.3.1.1 Behavioural perspective

The behavioural perspective has been the predominant way in which information literacy has been defined and researched (Webber & Johnston 2002; Asla & Williamson 2009). From a behavioural perspective, information literacy is understood as a group of skills and competences defined as 'an understanding and set of abilities enabling individuals to recognise when information is needed and have the capacity to define, locate, evaluate and use effectively the needed information' (Bundy 2004, p. 3). According to Webber and Johnston (2002) information literacy is defined as efficient and ethical information behaviour:

> *information literacy is the adoption of appropriate information behaviour to obtain, through whatever channel or medium, information well fitted to information needs, together with critical awareness of the importance of wise and ethical use of information in society (Webber & Johnston 2002).*

This behavioural approach of information literacy has predominated information literacy scholarship along with curriculum approaches to information literacy education. This approach is reflected in standards developed for information literacy education by diverse organisations and institutions, such as the *Australian and New Zealand information literacy framework* (Bundy 2004) and the *US Information literacy competency standards for higher education* (ACRL 2000), standards which consist of lists of skills, attributes, attitudes and knowledge.

However, this behavioural perspective of information literacy has some limitations. For instance, Bruce (1997a, 2008) claims that discussions about information literacy are often restrained when focused on just skills. Although Bruce agrees that these

skills are necessary, she points out that significant changes are arising in our information society and it will mean many information skills will need to be updated. Bruce states that discourse about information literacy needs to be developed and focused on how people engage with information in order to learn (Bruce 2008; Bruce & Partridge 2011; Bruce, Hughes & Somerville 2012; Bunce, Partridge & Davis 2012; Bruce et al. 2014).

Another limitation of the behavioural perspective is that standards and models for information literacy education, developed from this perspective, have been examined in terms of their transferability to contexts outside of educational settings (Yates 2013). Webber and Johnston (2000) point out how changes in our world impact the way in which people access information and also how changes in people's personal lives (e.g., ageing) affect their information needs. These authors maintain that standards and models for information literacy need to be adaptable to account for the changes that will take place throughout the course of life.

Recognising the limitations of the behavioural perspective, other lines of research have been developed in this field: the relational and socio-cultural perspectives. I explain these perspectives below.

2.3.1.2 Relational perspective

The relational perspective of information literacy was established by Bruce (1997b) based on a phenomenographic study of information literacy. Adopting a qualitative research methodology which investigates the different ways in which people experience or think about something, Bruce's study developed a relational model named "the seven faces of information literacy" where she identified seven different ways in which participants experienced information literacy. This relational model of information literacy describes information literacy as a complex of ways of experiencing information use. From the relational information literacy perspective, people's experiences assume a range of meanings depending on context. This perspective 'aims to obtain a deeper and more complex understanding of subjective realities based on participants' representations of their experiences. It collectively reveals the varying aspects of information users' 'life-worlds' and, thereby, obtains

an accurate and deep understanding of what a phenomenon means in practice' (Entwistle, cited in Somerville 2015, p.35). In addition, the relational perspective of information literacy 'recognizes that individuals experience information in relation to, not apart from, their environment and focuses on learners' experiences of engaging with information to attain more varied and complex understanding' (Marton, cited in Somerville 2015, p.36).

Despite information literacy's rise to prominence within the Library and Information Science (LIS) community, some researchers have expressed concern about the ways in which the concept is understood and applied. One primary cause of confusion arises from the term, "information literacy", being 'understood, in some circles, as being about the acquisition of technological skills, library skills and information skills (behavioural) while elsewhere they are used to refer to the experience of using information as we go about learning (relational)' (Bruce 2008, p.11).

Most studies about information literacy from a relational perspective have been developed in educational (Edwards 2006; Maybee 2006; Lupton 2008), and workplace contexts (McMahon & Bruce 2002; Kirk 2002; Boon, Johnston & Webber 2007; Abdi 2014). However, little research has explored information literacy from a relational perspective in community contexts. Yates, Partridge and Bruce (2009) conducted one of the few studies where they analysed how older Australians experienced information use in order to learn about their health, from a relational perspective of information literacy, in the everyday, community context.

The main feature of the relational perspective of information literacy is that it understands and describes information literacy from a user's point of view. The advantage of this view reveals the existing gap related to the understanding of information literacy between users' and experts' perspectives. Furthermore, it is not focused on measuring information literacy and instead emphasises the relationship between users and information, and the way they experience the world through using information to learn.

2.3.1.3 Socio-cultural perspective

The socio-cultural perspective is another approach in the information literacy research. This perspective is based on socio-cultural theories developed by theoreticians such as Vygotsky, Lave, Lemke, Rogoff and Wertsch (Wang, Bruce & Hughes 2011). Vygotsky (cited in Wang, Bruce & Hughes 2011, p. 297) states: 'Socio-cultural theories describe learning and development as being embedded within social events and occurring as a learner interacts with other people, objects, and events in the collaborative environment'.

From the socio-cultural perspective, information literacy is part of the activities of distinct groups and communities. Tuominen, Savolainen and Talja (2005, p. 341) claim: 'We need to understand the practices of these communities before we can effectively teach information literacy'. Lloyd (2006) advocates that:

> *From a socio-cultural perspective information literacy is best understood as a socially and culturally influenced process and practice, shaped by the situated nature of interaction between people and through embodied experience in specific information landscapes. In this respect the act of becoming information literate through engaging with information is not distinguished or separated from context but is one and the same thing (Lloyd 2006, p. 579).*

The current study is explored from a socio-cultural perspective. The majority of studies developed from a socio-cultural perspective have been conducted in educational (Lundh & Limberg 2008; Sundin, Limberg & Lundh 2008; Tuominen, Savolainen & Talja 2005) and workplace contexts (Lloyd-Zantiotis 2005; Lloyd 2007a, 2007b; Veinot 2007). However, there are few research studies in which information literacy is explored from a socio-cultural perspective in a community context. This perspective is suitable for researching and understanding how older adults, as community, experience information literacy within their socio-cultural environment.

2.3.2 Contexts of information literacy

Understanding context is an important aspect of information literacy research. According to Schatzki (cited in Lloyd & Williamson 2008, p. 8), 'recognising the influence of context is important because it determines the phenomenon and shapes the practices within it'. Schatzki (2002, p. 61) suggests that 'context embraces and entangles the phenomenon, giving shape to the entities within it, and has a composition and character that will vary' (Schatzki, cited in Lloyd & Williamson 2008, p. 8). Thus, information literacy has been researched within different contexts: education, workplace and community.

2.3.2.1 Education

Most research about information literacy has been carried out within the educational context (Edwards 2006; Maybee 2006; Lupton 2008). Information literacy research has predominated in schools and tertiary education libraries over recent years. Much of the research in information literacy focuses on the higher education sector, where information literacy is investigated in a specific discipline or university student cohort. Furthermore, information literacy research in educational contexts includes the study of the development and evaluation of Higher Education information literacy programs, information literacy as a generic skill or graduate attribute, and information literacy as expressed in information seeking behaviour (Edwards, Bruce & McAllister 2004). Research by Johnston, Partridge and Hughes (2014) explored the information literacy experiences of EFL (English as a Foreign Language) students.

However, little research in information literacy focuses on exploring how other groups of the population experience information literacy within other contexts. In 1989, the ALA Presidential Committee on Information Literacy's final report points out the importance of engaging another two contexts, workplace and community, in the information literacy research agenda. Lloyd and Williamson (2008) underline the importance of studying information literacy within various contexts. These authors point out that although information literacy has been described as core literacy, 'emerging empirical research indicates that the phenomenon will have different characteristics in different contexts and will be played out in culturally different

ways' (p. 3). In the following sections information literacy within workplace and community contexts are developed.

2.3.2.2 Workplace

Zurkowski (1974) links the term to the private service sector, the emerging complexity of the information age, attainment of economic and workplace goals, and the ability to use information to solve problems (Lloyd & Williamson 2008). Through the years, information literacy in the workplace context has continued to remain a significant and interesting topic of research. Recent research in information literacy in the workplace focuses on four areas: the need for IT skills in the workplace, the transfer of information literacy and IT skills from formal education to the workplace, the development of effective information literacy workplace programs, and workplace information use and behaviour (Edwards, Bruce & McAllister 2004; Conley & Gil 2011; Eckerdal 2011; Kmiec 2014).

Previous studies have pointed out the positive relevance of information literacy in the workplace context (Henderson et al. 2010; Abdi 2014). Bruce (1999) stated that:

> *Information literacy is about peoples' ability to operate effectively in an information society. This involves critical thinking, an awareness of personal and professional ethics, information evaluation, conceptualizing information needs, organizing information, interacting with information professionals and making effective use of information in problem-solving, decision-making and research. It is these information based processes which are crucial to the character of learning organizations and which need to be supported by the organization's technology infrastructure (Bruce 1999, p. 46).*

Bruce (1997b) identified seven faces of (or ways of experiencing) information literacy, described as experiences of: information technology, information sources, information process, information control, knowledge construction, knowledge extension, and wisdom. These experiences are linked to workplace processes of: environmental scanning; provision of in house and external information resources and services; information processing (packaging for internal/external consumption);

information/records management and archiving; corporate memory; research and development; professional ethics/codes of conduct (Williams, Cooper & Wavell 2014).

2.3.2.3 Community

According to Partridge, Bruce and Tilley (2008, p. 111), 'community information literacy is the application of information literacy in community contexts'. Little research has been developed on information literacy in the community context, although empirical studies are beginning to appear. This significant gap in research in the community sector, can be due to the wide range of societal groups and organisations as has been identified by several authors (Lloyd & Williamson 2008; Partridge 2008; Partridge, Bruce & Tilley 2008). The major interest of community information literacy is those who are disempowered in the global technological society such as disabled people, women or older adults (Partridge, Bruce & Tilley 2008). The Global Alliance for Partnerships on Media and Information Literacy (GAPMIL) articulates key strategic partnerships to drive media and information literacy development globally, through its application to eight development areas such as: access to information and knowledge for all citizens and education, teaching, and learning, including professional development; and Women, children and youth, disabled and other marginalized groups. It considers media and information literacy as a priority and states that media and information literacy empower all citizens (GAPMIL 2013). GAPMIL states that the purpose of its media and information literacy strategy is to help the most disadvantageous social groups such as people with disabilities, indigenous communities and ethnic and religious minorities, to have equal access to media and information literacy in order to provide them the access to information and knowledge, health and wellness, education, teaching and learning, including professional development (http://www.about-gapmil/).

The little research to date in information literacy in the community context has been focused on information access for social inclusion (Todd 1999; Williamson, Schauder & Bow 2000), or on the use of information and communication technology (Funston & Morrison 2000; Hardy 2001). More recent studies have explored

community information literacy. For example, Demasson (2014) aimed to understand the variation that exists in regard to the information literacy experience of people engaged in a serious leisure activity. This study used a constructionist perspective and a phenomenographic methodological approach. It uncovered the qualitatively different ways in which serious leisure participants constitute their social environment and construct meaning through information literacy. In another community information literacy study, Lloyd et al. (2013) explored how refugees as a community learned to engage with information and how their information literacy practice may be constructed to enable them to connect and be included in society. This study was conducted from a socio-cultural perspective. It identified complex and challenging information landscapes that present barriers to participation in society, revealing how the understanding of information literacy practices of refugees contributes to their social inclusion. Yates et al. (2012) investigated how health information literacy was experienced among older Australians within everyday contexts. They explored the concept of health information literacy (e.g., information use in the specific context of health) of older adults. Using phenomenography, Yates et al. (2012) identified seven qualitatively different ways Australians aged 65 years and older used information to learn about their health. This work is interesting because Yates et al. adopted a relational perspective to information literacy, which defines information literacy as using information to learn. Two previous Australian studies provide investigations into this area. Using qualitative approaches, Asla and Williamson (2009) and Asla, Williamson and Mills (2006) explored how older Australians (60 years and older) used information as part of their everyday lives. They adopted a more traditional behavioural view of information literacy as being focused on skills and actions. Together, the three studies reveal that information literacy is an important concept for older adults, and that much more work exploring the phenomenon is needed.

Given that the vast majority of information literacy research has explored how people use information in educational (Edwards 2006) or workplace settings (Lloyd-Zantiotis 2005) and very little research has explored information literacy in the context of everyday life (Partridge, Bruce & Tilley 2008), I conducted this current study in the community context. Further, of the studies that have begun to investigate

information literacy in this new context, very few have focused on information literacy and older adults.

In the following section, I provide an overview of older adults and their relationship with new and emerging technologies, pointing out the significant role of this population in today's society.

2.4 Older Adults

In this section, I justify the significance of doing this research, pointing out the significant role of older adults in today's society and how new technologies can help them to integrate into the information society, avoiding social exclusion and improving their quality of life. In addition, I explain why information literacy plays a crucial role for older adults, particularly in the context of new technologies. Finally, I identify the research gap that addresses information literacy of older adults in the context of new technologies.

2.4.1 Why am I conducting research about older adults?

The report titled *An Ageing Australia: Preparing for the Future* states that the Australian population is ageing (Australian Government, Productivity Commission 2013). According to the Global Age Watch Index, the percentage of Australians over 65 is set to increase significantly by 2030 (HelpAge International 2015). This growing proportion of older adults poses great challenges for the welfare society, as aging has considerable impact on social, economic, political, and health care institutions (Huber & Watson 2014). Palsdottir (2012, p. 135) states: 'Thus, the society needs to prepare for the increasing number of older adults, their quality of life, their prospects for actively participating in society and how they can be supported to manage their everyday life affairs'.

Given Australia's ageing population and the omnipresence of new technologies in everyday life, the use of Internet and information and communication technologies (ICT) for older adults is essential (Boulton-Lewis et al. 2007). However, according to a recent Australian Bureau of Statistics (ABS) report *Household Use of Information Technology*, just 46% of older adults, aged 65 years or over, were Internet users in

2012-13 (Australian Bureau of Statistics (ABS) 2014). In addition, the research report titled *Older Australians and the Take-Up of New Technologies* (Chesters, Ryan & Sinning 2013) claims that 65% of men and 73% of women aged 65 years or more never used the Internet to read or send emails. Furthermore, this report points out that age has a significantly negative effect on computer use and that access to an Internet-connected computer at home decreases with age, as do expectations among older Australians who have never used a computer that they will do so in the forthcoming year. These data suggest that there is a generational digital divide to be overcome. The report titled *Older Australians and the Internet: Bridging the Digital Divide* explores how older Australians who never or rarely use the Internet know about the types of online products and services available to them, and how they might use these to improve their daily lives. The Internet can provide older people with avenues for learning, networking, and participating in civic or political causes. It also enables them to benefit from e-health, e-banking and e-shopping. Embracing technologies can help them stay in contact with their families or friends, and expand their social contact and minimise loneliness. Also, they can access information, without the help of others, and also learn new things. This report identifies several barriers to Internet use, that exist for the over 50s: geographical, financial or physical constraints, illness, the inability to use online resources or lack of skills, being confused by the technology, no time or interest, and concerns about information security. The older Australians who participated in this report revealed that the key barriers to the use of the Internet are: lack of skills (76.5%), being confused by the technology (73.8%) and concerns about security and viruses (63.8%).

Every time older adults do not have the knowledge to allow them to access and handle new technologies, which is a requirement to access online information, they cannot fully participate in the information society (Morris 2007; Marcinkiewicz-Wilk 2016). Those older adults who acquire basic aptitudes for using ICT, knowing the basic functions of current IT programs, are able to learn how to use networks like the Internet and access the resources that these offer (Juznic et al. 2006; Van Deursen & Van Dijk 2011). For older adults, ICT offers ways to integrate into the information society, enhance their social inclusion and improve their quality of life (Boulton-Lewis et al. 2007; Tiberio, Scopelliti & Giuliani 2011).

Information literacy, understood as part of the activities of a community, where to be considered as information literate an individual has to learn to access, find, work with and use information and also to be able to use tools, such as tablets and smartphones, which enable them to carry out information practices in order to participate and solve problems in the everyday life of the community. Thus, information literacy is considered as a crucial tool in order to help older adults to acquire the necessary skills and basic knowledge to allow them to access and make use of new and emerging technologies. The information literacy of older adults in the context of new and emerging technologies is a topic which, to date, has received little attention by the research community. It is anticipated that this study will be of interest to the research domains of information literacy, library and information science, information technology, mobile device use and community education. It provides new knowledge and understanding about people's engagement with information in their everyday lives in the context of new and emerging technology. More specifically, the findings may be used to inform the way information and educational services and products aimed at supporting the information needs of older Australians are developed and delivered.

2.4.2 Older adults and new and emerging technologies

New and emerging technologies, such as the computer, Internet and mobile devices, have initiated fundamental compressions of time and space and, it follows, have qualitatively and quantitatively altered the exchange of information, knowledge, resources and capital to an 'anytime, anywhere' basis (Harvey 1989; Rubens, Kaplan & Okamoto 2011; Murphy et al. 2014; Anwar, Joshi & Tan 2015). The characteristics of new technologies define modern society, simplifying access to information and providing many communication tools. Given the importance of ICT in day-to-day life, there is an imperative for older adults to become users of these technologies. In the following sections, I identify and describe relevant research studies where the relationship between older adults and new and emerging technologies (computers, Internet and mobile devices) is explored, with the purpose of identifying the most important findings and gaps. Finally, I explore the

information-seeking behaviour of older adults and the barriers to them accessing new and emerging technologies.

2.4.2.1 Older adults and computers

Most studies reveal the importance for older adults of having the ability and opportunity to make use of computers in order to support and improve their quality of life and their participation in society, promoting active ageing and their social inclusion (Berkowsky et al. 2013; Bobillier et al. 2014; Pachana & Poulsen 2011; Winstead et al. 2013). Bobillier et al. (2014) examine the extent a new technological environment can improve the quality of life of elderly adults. The authors determine the psychosocial benefits for older adults from using a technological environment originally developed for cognitive stimulation and rehabilitation. This cognitive stimulation and rehabilitation is a group of activities which protect against declining cognitive abilities in aged populations. They are brain-based skills needed to carry out any task, and involve the recognition of sensory stimuli (smell, touch, hearing), attention, memory, motor skills (ability to manipulate objects), language, visual and spatial processing, and executive functions (Fisher 2014). Bobilier et al. (2014) researched a group of 17 residents using semi-structured interviews and longitudinal observations. The longitudinal research comprised of observations over a total period of 20 months of a group of 17 older adults living in a retirement house care unit. This study reveals that information and communication technologies may play an instrumental role in interconnectedness and social stimulation, and can be seen as a 'boundary object' that communicates between the residents' world (who are rather isolated) and their families' world (including grandchildren). Several studies have found that computer use by the aged has a positive impact on psychosocial outcomes; improving general well-being, reducing life stress and loneliness (Wagner, Hassanein & Head 2010).

Other research focuses on determining the place of learning and computer use in active ageing, pointing out that learning is an important aspect of active ageing and the use of technology can aid problem solving skills and assist older people to adapt to change. Studies examined the relationship between quality of life and active ageing, with learning in the context of technology (Boulton-Lewis et al. 2007;

Selwyn et al. 2003). Boulton-Lewis et al. (2007) find that learning is an important aspect of active ageing and the use of technology can aid problem solving skills and assist older people to adapt to change. They explore the relation of learning about technology to factors concerned with work, social, emotional status, health, life events and demographic details of older Australians. This study used a qualitative approach and explored whether different aspects of life, such as working, learning, social, spiritual, emotional, health, and demographic characteristics, predicted the likelihood of keeping up to date with new technologies or needing or wanting to learn to keep up to date with technology. The study concluded that: those who were more likely to remain current with technology were men who were interested in learning and doing new things and in current affairs and their families; those who reported they need to keep up to date with technology were participants of both genders who made an effort to learn new things and new activities. Also, they stated that they wanted to fulfil personal goals, and felt they had more to do in life. However, the concept of information literacy is not explored in these studies.

2.4.2.2 Older adults and the Internet

According to the National Seniors Productive Ageing Centre in Australia (Australian Government. Department of Health and Ageing 2011), older people with low Internet skills are unable to access important services over the web. They can be isolated from their community and family at a time in their lives when feeling connected is important. The Internet has now become part of day-to-day life. The report titled *Older Australians and the Internet: Bridging the Digital Divide* states that, improving Internet accessibility and strengthening user-based skills is increasingly important. Furthermore, this report claims that:
'For older generations, the switch to online forms of learning, communicating, accessing health information, banking and shopping can present a challenging task' (p. 21).

Several studies reveal the positive effect of the Internet for the inclusion and the empowerment of older adults. Cotten et al. (2012) examined whether Internet use reduced the probability of depression among older adults. The purpose of the study was to examine the relationship between Internet use and depression among retired

Americans (age 50+). These researchers explored how Internet use can decrease the level of depression of retired older adults aged 50 or older, thus improving the mental health of older adults. It is based on data from the 2006 Health and Retirement Study (HRS) and a large sample, 7.839 observations, and uses regression and propensity scores. It states that Internet use reduces depression by about 26% and reveals that Internet use produces a positive effect on the mental health of older adults. Other studies conclude that the Internet has the potential to allow individuals to transcend social and spatial barriers, providing older adults in Assisted and Independent Living Communities (AICs) with the ability to maintain and enhance social networks as well as provide a greater sense of connection to the world at large (Winstead et al. 2013).

However, in spite of benefits, there are a considerable percentage of older adults that are not users of the Internet. The Australian Bureau of Statistics (ABS) *Household Use of Information Technology, Australia* survey reports that 54% of older persons, aged 65 years or over, do not use the Internet (Australian Bureau of Statistics (ABS) 2014). The report titled *Older Australians and the Internet* revealed that one of the main barriers for non-users was skill based, because they did not know how to use the Internet. Sayago and Blat (2011, p. 359) claim: 'Difficulties remembering steps, understanding terms and using the mouse are more severe than problems perceiving visual information, understanding icons and using the keyboard'. These data show that information literacy plays a significant role in enabling Internet use. Learning to remember and understand are crucial basic competences that must be acquired by older people in order to successfully access the Internet.

Little research has explored the relationship between information literacy and the use or non-use of the Internet by older adults (Morris 2007; Juznic et al. 2006). In addition to a paucity of research, the preceding studies on Internet use demonstrate an absence of information literacy analysis.

2.4.2.3 Older adults and mobile devices

Mobile devices, such as smartphones and tablets, offer benefits that may be especially valuable to older adults. The simplicity, portability, and multi-

functionality of mobile devices provide a viable alternative to desktop computers. They offer tools to older adults such as applications for connecting with loved ones, accessing contact information, browsing Internet content, and playing games. In addition, mobile devices can help them remain more independent and maintain their quality of life (Leung et al. 2012).

2.4.2.3.1 Tablets

The report titled *Australians' Digital Lives* (Australian Communications and Media Authority (ACMA) 2015) reports that those aged 65 and over, more than 700,000 people (22%), went online using a tablet (May 2014), an increase of four percentage points on the previous reporting period (May 2013). However, a high percentage of older adults remain non users of tablets when compared with the usage of young people. Previous studies claim that older adults face difficulties and challenges when they use tablets in order to seek and retrieve information such as: they feel overcome for the vast amount of information, barriers that health issues (sight and mobility) may impose, and lack of technological skills. Further, researchers reveal the importance of acquiring information literacy competences in order to know how to access and use information through these devices (Tsai, Shillair & Cotten 2014). These insights occur within a general lack of research concerning the processes and necessary capabilities for successful tablet usage by older adults. Relatedly, there is a paucity of literature exploring how to extend and assist older adults to learn the information literacy skills needed for tablet use.

2.4.2.3.2 Smartphones

Smartphones provide benefits and convenience to users throughout society (Xu et al. 2011; Sarwar & Soomro 2013; Choudrie et al. 2014). However, not all people in society are adopting and using smartphones. This is especially true for older adults. Currently, there is very little research on the reasons why older adults do not adopt and use smartphones (Choudrie et al. 2014; Fondevila et al. 2015). Choudrie et al. (2014) investigated the adoption and usage behaviours of older adults (50+). From an online survey of 204 completed replies, the researchers found that observability, compatibility, social influence, facilitating conditions, effort expectancy and enjoyment are important to the adoption and use of smartphones within "silver-

surfers", older adults who are 'confident and competent' ICT users (Selwyn 2004, p. 370). This early research helps identify and understand the factors that encourage or inhibit smartphone use within the older adult population. On the other hand, Fondevila et al. (2015) investigated older adults and their ability to use and interest in ICTs. They analysed how older adults in Spain use mobile ICT applications, how they experiment with them and why they decide to use or not to use them. The authors worked with focus groups and interviews. Their research examined critically whether and how differences in age influences elder users' experience and ability to use apps, and what other factors like background knowledge or past experience, have a strong influence on elders' use, experience and perception of apps. This research underlines the importance of focusing on apps because apps reflect the interests of the individual user.

The study concluded that older adults can be fascinated by new ICT if they understand it and are able to connect with its purpose. Also, rather than age, experience levels might have a stronger influence on ICT interest and skills when experimenting and exploring technological devices that have never been used. The study revealed interest in new technologies combined with very specific needs, demands, and expectations that are not always met. In addition, this research concluded that elders, having the same social, economic, and geographical background, shared similar attitudes towards technology despite their age. However, there is a lack of research that addresses older adults and their interests with regard to ICT technologies such as smartphone applications (apps), and what their specific needs and demands are regarding these new digital technologies and tools. Additionally, there has been very little research dedicated to the analysis of the use of apps by this group of population in their everyday lives.

2.4.2.4 Older adults and information seeking behaviour

Some studies have examined the information-seeking behaviour of older adults, the types of sources that they use to satisfy their information needs and the existing barriers in order to seek information (Wicks 2004; Manafo & Wong 2012; Chaudhuri et al. 2013). Asla and Williamson (2009) explored the information-seeking behaviour and the information literacy needs of people in the fourth age through two significant

projects. 'The fourth age' is the last stage of life that has also been referred as 'the disability zone', which is characterized by illness, frailty, dependence and the imminence of death (Lamdin & Fugate 1997, pp. 30-31).

The Williamson study was framed by two major conceptual strands. One was an ecological theory, by which participants were viewed within the context of their own circumstances and experiences, including their personal characteristics, values, socioeconomic circumstances, lifestyles, and physical environments. The other conceptual strand was a theory related to notions of incidental information acquisition, by which people discover information they sometimes do not even know existed. The sample was made up of 202 older adults, aged 60 and over, living either in metropolitan Melbourne or rural Victoria, in Australia, in the early 1990s. Asla's study focused on people in the fourth age and explored the role of information and communication in successful aging for that group.

The purpose of these studies was to focus on the information-seeking behaviour of this group in an attempt to identify information literacy needs. The methodology undertaken principally was qualitative although they did collect some quantitative data. The major source of data was a long interview that explored information needs and the sources of information used to meet those needs. These authors pointed out that, although information needs and sources used are fewer in the fourth age, they are still important to the people involved. The studies concluded that information literacy is crucial to the well-being of older people, and that further work was needed to more fully understand the phenomenon.

These studies explored the information literacy of older Australians, however they did not focus specifically on the context of new and emerging technologies. We live in not just an information age but also a technological age. Technology such as mobile devices and the Internet are becoming inextricably linked to the ways in which people seek and use information. To date, little research has explored how older Australians experience information literacy in the context of new and emerging technologies. Thus, my research aims to contribute to filling this gap. It explores the following research question: How do older Australians experience information literacy within the context of new and emerging technology?

2.4.2.5 Older adults and accessibility barriers to new and emerging technologies

The International Covenant on Civil and Political Rights (HREOC 2000, pp. 3-6) requires that people have access to information, government services, and other opportunities (in areas such as education, employment and the commercial services necessary to secure an adequate standard of living) without restrictions and without discrimination on grounds such as age. With increasing utilisation of web services by government departments and commercial organisations, there is an urgent need to reduce the division between the information rich and the information poor. According to the Human Rights and Equal Opportunity Commission (HREOC 2000), some of the barriers that may prevent older Australians from having equal access to e-commerce and other on-line services may be physical, affordability and access to equipment, attitudes and awareness.

Currently, older adults experience many barriers when they access new and emerging technologies. Several studies reveal that the major obstacles to using technology are cost, lack of experience and lack of access (Morris 2007; Barnard et al. 2013; Fletcher & Jensen 2015). Others point out that older adults are steeped in their own habits, acquired during a different era. Older adults may not be technology-shy but may simply not see the need for what is currently available. In addition, new technologies have many features, some of which may intimidate older users or may not be seen as being useful. Familiarity with technology, age, education, and gender are found to be correlated with new technologies as well as operating and shopping for new electronic devices (Huber & Watson 2014). Also, the lack of motivation and the lack of awareness are big problems. Many older people simply do not know how to use the Internet and what the Internet can be used for (Morris 2007). Lack of awareness and knowledge about how they can access new technologies is one of the most significant accessibility barriers to new technologies. Most studies have focused on knowing the physical, cognitive and social accessibility barriers. However, little research has explored the crucial role of information literacy in order to enable access to and use of new technologies. Kumar et al. (2013) stated that many older adults have anxiety problems and consequently are reluctant to explore new

technologies. They also have difficulty transferring skills from one context to another. Sayago and Blat (2011) claimed that remembering and understanding terms is the major barrier to access to the web. The study of Leung et al. (2012) revealed that fewer older adults than younger adults prefer using the Internet to help them to learn. Almost half of older adults' reasons for not using this learning method were related to not being able to find the information they needed. Similarly, almost half of middle-aged respondents' reasons for not using this learning method were related to taking too much time to find the desired information. These studies show that information literacy plays a significant role in helping people to access and use new technologies successfully.

2.4.3 Information literacy and older adults

In the following section, I explain why information literacy is important and which is the value of information literacy for older adults specifically.

2.4.3.1 The value of information literacy. Why is information literacy important?

Currently, people live in a society where information is abundant, and the use of new technologies is increasing considerably (Webster 2014). They are faced with diverse information choices available through different sources and media. According to Leung (2010) this abundance of information and new technologies poses challenges for society, and citizens need to acquire skills and competences in order to understand, evaluate, use and access information effectively. Thus, an illiterate person can be disadvantaged, and it is crucial to democratic processes that all citizens have the skills and opportunities to inform themselves on community matters and to participate in society. The Alexandria Proclamation (2005) states:

> *A thriving national and global culture, economy and democracy will best be advanced by people who are empowered in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion within a range of cultural contexts.*

Thus, information literacy is key to promoting social inclusion for all people. Furthermore, the importance of information literacy in workplace learning, lifelong learning and participative citizenship is stated by Hepworth and Walton (2009), and succinctly expressed in the Australian Library and Information Association's (2001) *Statement on information literacy for all Australians,* where information literacy is considered a prerequisite for: participative citizenship, social inclusion, the creation of new knowledge, personal, vocational, corporate and organisational empowerment, and learning for life.

2.4.3.2 Why is information literacy important for older adults?

There is evidence to suggest that it is important for older adults to have abilities and opportunities to use new and emerging technologies to support and improve their quality of life and their participation in society (Cotten et al. 2012; Abad 2014). COTA (The Council on the Ageing) National Seniors (2004), in a submission to DEST (Department of Education, Science and Training) concerning adult learning in Australia, stated that information literacy and the use of the basic technology tools are a prerequisite skill for participation in Australia's economy but note that the current generation of older Australians has a relatively low rate of use of electronic tools and applications (p. 4). Thus, information literacy is key to acquiring the necessary competences to access information through new and emerging technologies. In addition, Leung (2010) obtained results which supported the notion that information literacy is significantly linked to life quality, showing that the more information literate users feel they are, the more satisfied they are with their quality of life. Asla and Williamson (2009) claimed that information literacy is crucial to the well-being of older people, according to the results obtained in their research.

2.4.4 Information literacy, older adults and mobile devices: The research gap

To date little research has explored how older adults experience information literacy through the use of mobile devices. Most studies that have examined how older adults use mobile devices focus on investigating accessibility barriers (Leung et al. 2012; Jayroe & Wolfram 2012); or the needs, uses and dispositional attributes (Vroman, Arthanat & Lysack 2015; Fondevila et al. 2015). Tsai, Shillair and Cotten (2014)

explored how older adults learn to use tablet computers. This study focused on how older adults learned to use a specific type of ICT and the role that social support played in this process. Through this research, the authors hoped to develop a better understanding of how to close the digital divide through improving digital literacy for older adults through the use of tablets.

In my research, digital literacy is understood according to the definition given by Martin:

> Digital literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process (Martin 2006, p.19)

This definition denotes exclusively digital and technological abilities, which enable individuals to make use of ICT. These abilities would be considered as complementary skills to information literacy competences.

Fondevila et al. (2015) analysed in focus groups how Spanish elders perceive, use and experience apps for mobile devices such as tablets and smartphones, how they experiment with them and why they decide to use or not to use them. They analysed whether and how differences in age influenced elders' uses, experiences and abilities to use apps and what other factors, such as existing background knowledge or past experiences, have a strong influence on elders' uses, experiences and perceptions of apps. The study reveals that older adults show a great interest in new technologies combined with very specific needs, demands, and expectations that are not always met.

Although these studies reveal the lack of information literacy competences of older adults and the importance of considering information literacy in the context of new technologies, they do not explore information literacy in their research studies. Thus, this study hopes to begin to address this gap in this field of knowledge.

Having explored, analysed and identified the main theories, concepts, data, and studies related to the research topic, I have detected a significant gap in the field of knowledge, leading me to research: "Understanding information literacy of older Australians through the use of mobile devices in the context of everyday life".

To date, little research has explored how older Australians experience information literacy using mobile devices. Most studies don't consider the concept of information literacy, although their findings reveal that older adults have a low knowledge of digital literacy and some of them a limited grasp of basic competences. Furthermore, the majority of studies are focused on computers and Internet use, and there is little research about the use of smartphones and tablets. This project contributes to filling this gap, by contributing to our understanding of how older adults use and engage with information using mobile devices.

Very little research has explored information literacy in the context of everyday life (Partridge, Bruce & Tilley 2008). Of the studies that have begun to investigate information literacy in this new context, few have focussed on information literacy and older adults. Thus, in this study I explore information literacy in the community context. The goal of this study then is to fill in the lack in the research that addresses the connection between information literacy (older adults' use of mobile devices) and the context of everyday life.

2.5 Conclusion

The evidence presented in this chapter demonstrates, on one hand, the lack of research about how older adults experience information literacy in the framework of mobile devices, specifically in the community context. On the other hand, it notes the significant role that older adults play in society, however at the same time the existence of a digital divide due to a lack of knowledge about how to use and access to new technologies by older adults. Thus, it is important that older adults acquire basic attitudes and competences for using new technologies, allowing them to use networks like the Internet, to use mobile devices and access resources that these offer. For older adults, this is a means of integration into the information society, their social inclusion and the improvement of their quality of life. Within this

discourse, information literacy is revealed as a crucial tool in order to acquire the competences that help them to use and access new technologies successfully.

In conclusion, the information literacy of older adults in the context of new and emerging technologies is a topic which, to date, has received little attention by the research community. It is anticipated that this study will be of interest to the research domains of information literacy, library and information science, information technology, mobile device use and community education. It will provide new knowledge and understanding about people's engagement with information in their everyday lives in the context of new and emerging technologies, specifically with respect to mobile devices. The findings may be used to inform the way information and educational services and products aimed at supporting the information needs of older Australians are developed and delivered.

3 Research methodology

3.1 Introduction

In this chapter I describe and discuss the philosophical framework and the research methodology used in this study: Constructivist Grounded Theory. I outline the research design, including sampling and recruitment, development and implementation of data collection, and data analysis. In addition, I describe and discuss the evaluation criteria applied in the study to ensure a quality outcome. Finally, I conclude the chapter with a discussion on the ethical considerations.

3.2 The research paradigm

According to Guba and Lincoln (1994, p.105) a research paradigm can be defined as the 'basic belief system or world view that guides the investigation'. A paradigm is an approach to discovering answers to questions, based on the researcher's understanding of the truth. Thus, I explore the paradigm adopted for this research in order to clarify my structure of inquiry and the methodological choice in this study.

I conducted this research from an interpretivist research paradigm. Interpretivist research asks what can be understood about the social world (Burnett & Lingam 2012). The interpretivist paradigm looks for 'culturally derived and historically situated interpretations of the social life-world' (Crotty 1998, p. 67). There is no direct one-to-one relationship between ourselves (subjects) and the world (object). Instead, the world is interpreted through the classification schemas of the mind (Williams & May 1996). Hence, interpretivism is based on the belief that "the truth" is constructed in the minds of the interpreter and the only thing that is true is what people think is true (Williamson 2002). Because each person may think differently, there can be many "truths". In this study, I considered, as Denzin and Lincoln state, that reality is socially constructed (Denzin & Lincoln 2011). Seymore (2012) states that the understanding of "reality" is not a simple account of what is; rather, according to Fisher (2007), it is something that people in societies and groups form from the following:

- Their interpretation of reality, which is influenced by their values and their way of seeing the world
- OtherAnother people's interpretation
- The compromises and agreements that arise out of the negotiations between the first two (Fisher 2007, p. 23).

The purpose of this research was to explore and understand the ways people experience a particular phenomenon (i.e. information literacy and mobile devices), consequently an interpretative research paradigm is an appropriate paradigm for the current research. This is because the interpretivist paradigm is well suited to research that seeks to uncover the nature of people's experiences and to develop that conceptual understanding of that experience (Strauss & Corbin 1998). In this study I recognise that people act and interact in complex ways and have their own interpretations of the phenomenon. I, as researcher, further interpret these interpretations.

Furthermore, the chosen constructivist version of Grounded Theory methodology lies squarely within the interpretative approach (Charmaz 2006). Charmaz states that reality is constructed not just by research participants' meanings and views, but also, by the researcher's finished grounded theories as a result of the researcher's interpretative analysis, knowledge and experiential views (Charmaz 2006, p.10). Hence, reality is constructed by both, researcher and research participants.

The theoretical perspective that is closely linked to objectivism is positivism, which argues that reality exists external to the researcher and must be investigated through the rigorous process of scientific inquiry (Gray 2013). For this reason, this theoretical perspective was not considered suitable for this study. In contrast, Crotty states that constructivism rejects this view of human knowledge (Crotty 1998). Truth and meaning do not exist in some external world, but they are created by the subject's interactions with the world (Crotty 1998). Meaning is constructed, not discovered, so subjects construct their own meaning in different ways, even in relation to the same phenomenon (Gray 2013). Hence, multiple, contradictory but equally valid accounts of the world can exist. Thus, the theoretical perspective linked to constructivism is interpretivism.

In conclusion, as the aim of this study is to explore how older adults experience information literacy and their views or perspectives of these experiences, I adopted an interpretivist paradigm in this research. Consequently, I followed an inductive approach where plans are made for data collection, after which the data were analysed to see if any patterns could emerge that would suggest relationships between variables. Interpretative studies are typically inductive in nature (Gray 2013, p. 37).

3.3 Grounded Theory

I selected Constructivist Grounded Theory method, which is one version of Grounded Theory, for this qualitative study. Grounded Theory is defined as 'a qualitative research design in which the inquirer generates a general explanation (a theory) of a process, an action, or an interaction shaped by the views of participants in a study' (Creswell 2013, p. 83). Thus, the main aim of Grounded Theory is to generate a theory (Glaser & Strauss 1967). This feature is particularly suitable for a research area where little knowledge or no research is available. This process involves using multiple stages of data collection and the refinement and interrelationships of categories of information (Charmaz 2006; Strauss & Corbin 1998). In this section I outline the evolution of Grounded Theory as a research method, including a description of the Constructivist Grounded Theory approach. I also outline the suitability of the approach for this study.

3.3.1 Evolution of Grounded Theory

Grounded Theory was developed by American sociologists Barney Glaser and Anselm Strauss in the 1960s (Glaser & Strauss 1965). They introduced the new method in their 1967 publication, *Discovery Grounded Theory: Strategies for Qualitative Research*. This method was developed because Glaser and Strauss believed that social science researchers needed an approach that would allow the researcher to move from data to theory, so that new theories could emerge. By developing new theories in this way, the theories would be specific to the context in which they had been developed. The theories would be "grounded" in the data from which they had emerged rather than on data from pre-existing theories. Glaser and

Strauss developed "Grounded Theory" as an investigative research method with no preconceived hypothesis and using continually comparative analysis of data.

Once researchers adopted it for their own purposes and Grounded Theory studies began to be published, it became clear that the new methodology could be interpreted and applied in a number of different ways. Even the creators of Grounded Theory, Barney Glaser and Anselm Strauss, began to disagree about the nature of the method and how it ought to be practised. As a result, Grounded Theory has evolved over time into three major versions and perspectives (Creswell 2013): Classical (Glaser 1978); Strauss and Corbin's more structured approach and systematic perspective (Strauss & Corbin 1998); and Charmaz's constructivist version and perspective (Charmaz 2006).

After their influential book was published in 1967, Barney Glaser and Anselm Strauss, adopted different perspectives to the "classical" Grounded Theory they had developed together. Their difference of perspective was primarily grounded in divergent views on data analysis (Mansourian 2006). While Glaser continued to view Grounded Theory as a method to be used in discovering theories, Strauss's view had shifted; he began to view Grounded Theory as a method to be used in verification of theories (Charmaz 2004). Consequently, Strauss, in collaboration with a new researcher by the name of Juliet M Corbin, introduced another version of Grounded Theory in the book *Basics of Qualitative Research: Grounded Theory Procedures and Techniques.*

This new Grounded Theory became known as Straussian, or Strauss and Corbin Grounded Theory. The new version of the method was based on Strauss and Corbin's (1998) belief that Grounded Theory should be corroborated, verified and shaped by the influence of the researcher's existing ideas, knowledge and experience. Instead of discovering theories, this newer version of Grounded Theory focussed on verifying theories. Strauss and Corbin (1998) also believed that the original approach to Grounded Theory was too general and did not define the data analysis process in enough detail. They proposed a more pragmatic approach, with structured guidelines for theory building, and emphasising the use of data analysis through three levels of

coding: open, axial and selective coding. In contrast, Glaser's approach approaches data analysis through two levels of coding: initial and theoretical coding.

In 2006, Charmaz published *Constructing Grounded Theory*, which takes a social constructivist perspective to the method. Consequently, Charmaz's Constructivist Grounded Theory approach emerged as the third major perspective. This third version of Grounded Theory is based in the view that knowledge is constructed by individuals in a social context and that researchers do not merely report research findings but interpret the research participants' construction of reality (Pidgeon & Henwood 2004). Adopting a relativist approach, Constructivist Grounded Theory acknowledges the multiple standpoints and realities of both the researcher and the participants. According to Charmaz (2009, p. 143): 'Constructivist Grounded Theory encourages the researcher to examine the standpoints of the participants, their historical locations, and social circumstances'. Charmaz (2006) asserts that researchers construct theories from their interactions with people, places, and research perspectives. Charmaz also outlines a different approach to analysis to the two previous versions of the method, proposing two levels of coding: initial and focused coding, where themes are coded but not concepts or categories. The constructivist approach is more flexible, proposing general guides rather than strict rules to follow in the research process.

In summary, the differences among current grounded theorists arise in the following areas: epistemological allegiances; methodological strategies that constitute Grounded Theory; assumptions about what "theory" means; and conceptual directions (Morse et al. 2009, p.135).

While Glasser and Strauss (1967, p. 25) say theory 'is more generally applicable and has greater explanatory and predictive power', Charmaz (2006, p.126) provides another definition of theory, which points to understanding rather than explanation. In this definition, theoretical understanding is viewed as abstract and interpretative, and Charmaz (2006) claims that this interpretative theory requires imaginative understanding of the phenomenon.

These understandings of theory were taken into account to answer the research question and all of them could provide understanding of how the information literacy phenomenon is experienced by older adults using mobile devices.

Another difference is that Glaser and Strauss (1967) affirm that researchers should start research with an open mind and avoid preconceptions, while Charmaz (2006, p.166) considers that 'literature review can serve as an opportunity to set the stage for what you do in subsequent sections or chapters and analyse the most significant works in relation to what the researcher addressed in his/her now developed Grounded Theory'. In this research, I include a preliminary literature review. It is considered an essential requirement in order to define the research field.

The role of the researcher is also questioned by the different approaches. While in classic Grounded Theory the researcher is an observer of emerging theory, Charmaz (2006) considers the researcher as co-creator of theory. Furthermore, it is also discussed if the researcher can separate knowledge and experience from their research. Charmaz (1990, p.1170) claims that 'rather than reflecting a tabula rasa, grounded theorists bring to their studies the general perspectives of their disciplines, their own philosophical, theoretical, substantive, and methodological proclivities, their particular research interests, and their biographies'. Epistemologically, constructivists believe it is impossible to separate researcher from participant in the generation of data (Birks & Mills 2011, p.56).

Discussion between the three perspectives of Grounded Theory continues. However, these approaches exist, and they are used by researchers in multiple disciplines. I summarise the key features of the three major schools of Grounded Theory according to Creswell (2013) in Table 3.1.

3.3.2 Constructivist Grounded Theory

Constructivist Grounded Theory was the method selected for this study. As noted above, it is the more recent variation of the broader Grounded Theory methodology. The key difference between Constructivist Grounded Theory and the earlier versions of the method is the constructionist epistemology. I assume that both constructivism

and constructionism underpin the Constructivist Grounded Theory method. According to Crotty (1998) the constructivist approach is focused only on how meaning is constructed in the individual mind and argues that individuals construct meaning as result of their prior experiences, while the term constructionist argues that individuals construct meaning through interactions within their social context. In Constructivist Grounded Theory, the meaning and the final theory are co-constructed based on the shared experiences and understanding of the phenomenon between the participants and the researcher (Charmaz 2014). These shared experiences and understandings of the phenomenon adhere to the construction. But also, constructivism underpins the Constructivist Grounded Theory since the researcher creates codes and categories based on their own understandings (Charmaz 2014). This individual creation of meaning aligns with constructivism.

	PERSPECTIVES	FEATURES
Glaser	Emerging	Abstract: Grounded Theory exists at the most abstract conceptual level. No categorical: The theory is grounded in the data and it is not crammed into groups. Substantive: Grounded Theory must meet four criteria: fit, work, relevance and modifiability.
Strauss & Corbin	Systematic	Open coding: to create groups of data about the research, segmenting the information into groups. Axial coding: to select one open coding group, placing it in the middle of all data, and relate other groups to it. Selective coding: to generate a theory from the correlations of the groups in the axial coding model.
Charmaz	Constructivist	Feelings: A constructivist approach explains how the individuals feel, as they experience their feelings. Beliefs: A constructivist study identifies the beliefs of the researcher and shuns predetermined groups. Meaning: The narrative is written to be more explanatory of the larger picture and the perceptions of the participants being researched.

Table 3.1 Comparison of the three major schools of Grounded Theory (Creswell 2013)

Although I consider that both constructivism and constructionism underpin Constructivist Grounded Theory, I use the term "constructivist" when I mention the

research method used in this research, since it is used by Kathy Charmaz, the pioneer of Constructivist Grounded Theory.

Constructivist Grounded Theory is informed by the theoretical perspective of symbolic interactionism (Charmaz 2006).

According to Blumer (1969) there are three basic assumptions which underpin symbolic interactionism:

- First, human beings act toward things on the basis of the meaning that the things have for them. People, individually and collectively, act on the basis of the meanings that things have for them. That is, people do not respond directly to things but attach meaning to the things and act on the basis of meaning.
- Second, the meaning of things is derived from the social interaction that one has with one's fellows. The meaning arises in the process of interaction among individuals. Meaning for an individual emerges out of the ways in which other individuals act to define things. Symbolic interactionists assume that individuals are able to act because they have agreed on the meanings attached to things in their environment.
- Third, these meanings are handled in and modified through an interpretative process used by the person in dealing with the things he/she encounters. The meanings are assigned and modified through an interpretative process that is ever changing, subject to redefinition, relocation and realignments.

Grounded Theory by Strauss and Corbin (1998) emphasises the use of data analysis (systematic approach), and Grounded Theory by Glaser (emerging approach) allows the data to form theory rather than using predefined groups to determine the outcome such as in the systematic approach (Glaser 1978). However, Grounded Theory by Charmaz (Constructivist approach) emphasises the views and feelings of the people being researched rather than gathering facts and describing acts (Charmaz 2006).

The constructivist approach was the most suitable in this study according to the object of research which is to understand the views, perceptions, and experiences of

older adults using mobile devices in order to get, create and share information, and knowing how they experience information literacy using mobile devices.

3.3.3 Constructivism and social constructivism

In this section I discuss Constructivism and Social Constructivism, since this study adopts the Constructivist Grounded method of research. This method is positioned within the interpretative paradigm, which is also known as social constructivism, and whose aim is to interpret and understand participants' views and the meanings they attribute to certain situations (Creswell 2013, p. 24).

Constructivism proposes that each individual mentally constructs the world of experience through cognitive processes (Young & Collin 2004). Meaning is constructed by an individual rather than discovered (Charmaz 2006). Vygotsky, Piaget and Bruner are considered as central figures among constructivists. Within constructivism, there are different positions. For instance, radical constructivists like von Glasersfeld (1995) interprets that it is the individual mind that constructs reality. More moderate constructivists, like Kelly (1955) and Piaget (1969), acknowledge that individual constructions take place within a systematic relationship to the external world. Finally, social constructivists, such as Bruner (1990) and Vygotsky (1978), recognise that influences on individual construction are derived from and preceded by social relationships. Vygotsky's (1978) socio-cultural theory focuses on the experience of individuals in a common social context. Vygotsky claims that knowledge is first constructed in a social context (interpsychological) and then internally by the individual (intrapsychological). Consequently, meaning is constructed by individuals and their social interactions.

This study has been underpinned by the epistemological assumptions of social constructivism, and the ways they interact in our understandings of our world. Participants are seen as individuals and social beings that must be understood in their natural setting or everyday context in order to understand their experiences. This allows exploring information literacy to understand the role it has in the process of knowledge construction. Furthermore, I investigate the information practices of older

adults in order to create and share content using mobile devices, presuming that in engaging in information practices there is knowledge construction.

3.3.4 Reasons for using Constructivist Grounded Theory

I chose Grounded Theory generally, and Constructivist Grounded Theory specifically, for this study for four reasons.

Firstly, Constructivist Grounded Theory is well suited to inquiry aimed at understanding phenomena (Glaser & Strauss 1999). Further, Constructivist Grounded Theory is appropriate to explore human experiences (Charmaz 2003). A Constructivist Grounded Theory study allows the researcher to construct theories through their past and present involvements, and interactions with people's perspectives, and it emphasises the views and feelings of the people taking part in the study, rather than just gathering facts and describing acts (Charmaz 2006, p. 10). Thus, Constructivist Grounded Theory fits well with the nature and context of the study, which is to gain a better understanding of the phenomenon, older adults' experience of information literacy and mobile devices.

Secondly, given the intent of Grounded Theory is to generate or discover a theory with strong supporting data (Charmaz 2006), and as demonstrated in the literature review, there is no substantive theory to explain the way older adults experience information literacy.

Thirdly, Constructivist Grounded Theory has been demonstrated to be an appropriate way to explore information literacy. It has been used in previous information literacy research, including doctoral studies (Harlan 2012; Lipu, Willimason & Lloyd 2007; Lloyd 2006; Miller 2014). These studies demonstrated that Constructivist Grounded Theory is a suitable, credible and trustworthy method to explore and understand information literacy. Lipu, Williamson and Lloyd observed: 'Grounded Theory provides a suitable platform for research into what it means to be information literate and how information literacy is made manifest in a community of practice' (Lipu, Williamson & Lloyd 2007).

Finally, Constructivist Grounded Theory was considered an appropriate methodological choice for this research because it is consistent with my constructivist worldview, in that it suggests that a theory is constructed rather than found in the data (Charmaz 2006). This position acknowledges the subjectivity of the researcher in analysing data (Charmaz 2006). As I understand knowledge to be subjective, it is important to use a method that adopts this position. Furthermore, the method has allowed me to value older adults' voices in describing their experiences, as it positions the development of theory as a 'co-construction between researcher and participants' (Charmaz 2006, p. 130). This further supports my worldview that reality is co-constructed by the researcher and participants.

3.4 Research design and implementation

In this section I outline the research design of this study. I describe who the participants were and how they were recruited, how the data were collected and analysed, and how quality was addressed and ensured in the study.

3.4.1 The Participants: selection, sampling and recruitment

Twelve participants took part in this study. Four participants took part in the pilot study and eight participants in the main study. I decided to include the data gathered from participants of the pilot study because the phenomenon under investigation is the same and the participants provided rich data (Charmaz 2014). In addition, this is an accepted practice in Constructivist Grounded Theory (see Davis, K 2015; Mulatiningsih, B 2017). All participants were older adults who resided in a regional town in Queensland, Australia, and were users of mobile devices in their daily lives. I provide the profiles of each participant in Chapter 4. In this section I outline the criteria for selecting participants for the study and the approaches used for recruiting.

3.4.1.1 Selection criteria

In a Grounded Theory study, participants must have partaken in the process or action which is being studied (Creswell 2013, p.150). Consequently, 'purposive sampling' (Birks & Mills 2011) was used during all phases of this study, to identify and select suitable participants. This allowed me to define specific criteria for participating in

the research and to target and locate participants based on these criteria. Thus, in this study, participants were required to meet the following criteria:

- Age: This study was interested in understanding the experiences of older Australians. The Australian Bureau of Statistics (ABS), report *Who are Australia's older people?* defines older adults as people aged 65 years or over. Consequently, to adhere to Australian Government practices and definitions, participants who were selected for the study were aged 65 or older.
- Mobile device user: This study considers mobile devices as smartphones and tablets. Participants had to make use of tablets and/or smartphones in their everyday lives. I did not impose criteria for "use" (e.g., daily, weekly). I allowed potential participants to decide if they were a "user" and self-select their eligibility for this study, based on their understanding of 'use'.

  Petsas et al. (2001) suggest that mobile devices are technologies such as Personal Digital Assistants (PDAs), smartphones, and tablet computers; and this could also include such things as web-based systems that support both Internet and mobile access. Thus, smartphones and tablets are considered as types of mobile devices defined as:

  - Smartphones are handheld devices that combine mobile phone capabilities with the more basic features that are found in a handheld computer or a personal digital assistant (Beal 2014). The basic characteristics of smartphones, given by Cassavoy (2014), would be: A smartphone is expected to have an operating system that will enable it to run applications. Although almost all mobile phones these days have some kind of software, a smartphone will have the capability to handle more complex tasks. It supports the downloading of applications. Smartphone applications may be used to create and edit Microsoft Office files, handle personal and business finance management, and get driving directions through Global Positioning Systems (GPS). Also, smartphones can access the Web (Cassavoy 2014).
  - Tablet computers are defined according to Balaji (2014) as flat touch screen devices like a slate used to interact with digital content with

fingers, unlike a traditional personal computer which uses a keyboard and a mouse. Recently hybrid tablets have also been introduced in the market with detachable keyboards. They are portable and lightweight devices which enable the user to access email, surf the web, and play music and games (Balaji 2014).

- Geographic location: Participants selected for this study had to live in a regional town of Queensland, Australia, and to be available for a face-to-face interview, in person or using a video and audio videoconferencing tool on the Internet (i.e. Zoom). This regional town was considered a suitable place to facilitate the recruitment of participants since it is one of the Queensland's largest regional towns, where a high percentage of this city's population were 65 years and over. In addition, the number of persons aged 65 and above in this region is projected to increase by around 26,000 between 2011 and 2036 (*Queensland Government Population Projections: 2015 Edition,* Queensland Government Statistician's Office 2015). That is a high rate of older age groups (65+). Thus, this regional town provides an appropriate site for data collection to ensure project findings are applicable at the state or national level. Further, I considered this regional town a suitable place to facilitate the recruitment of participants since I lived there, and I had contacts that helped me to have access to potential participants.

3.4.1.2 Sampling and recruitment

In this study, there were two phases of data collection: the pilot study, and the main study. Sampling and recruitment took different forms across these two phases. In both phases, participants were selected according to the criteria mentioned in the previous section.

3.4.1.2.1 Pilot study

In the first phase, the pilot study, I recruited four participants. For this phase I used convenience sampling. Convenience sampling is a type of nonprobability sampling where people that possess practical criteria, such as easy accessibility or availability to participate at a given time, are included to participate in the study (Dörnyei 2007). Thus, I used convenience sampling for the pilot study because this form of sampling

is focused on convenience and accessibility of participants and I was concerned about the difficulty to access participants, as I wanted to conduct the interviews face-to-face. I chose face-to-face interviews as the most suitable interviewing mode because they are particularly useful for pursuing in-depth information around a topic (Adams & Cox 2008).

Furthermore, I took into account the interviewees' characteristics related to their age, the nature of the research and the type of information sought. Shuy (2003) states that face-to-face interviews elicit everyday conversations in a more natural manner and they create a rapport between interviewer and interviewee more easily than with other interviewing modes. The building of an effective communication relationship can help participants to feel more comfortable to express their views, feelings and experiences (Shuy 2003). Shuy (2003, p. 180) also claims that face-to-face interviews are better for interviewing older participants since this interviewing mode allows the researcher to detect, see and respond to any difficulty or concern from the interviewees, which are expressed throughout non-verbal communication such as body language or eye contact.

Convenience sampling is made up of people who are easy to access such as friends and family. I had existing relationships with three of the four pilot participants: one was a friend who I met in a party which celebrated the christening of a friend; and two were a pastor who teaches English in a church where my husband went regularly to learn English, and his wife. A fourth participant heard about the project from a mutual friend, who talked to her about the project.

Further, convenience sampling was considered appropriate because the pilot study was focused on testing the interview questions and the data collection techniques, and it only required a small number of participants. I contacted the potential participants directly and sent them emails, where a Participant Information Sheet and Consent Form were attached in compliance with the University of Southern Queensland (USQ) Human Research Ethics Committee. All the participants were given clarifying information, through these documents, about their right to withdraw at any time with no personal consequences, and that participation was voluntary.

3.4.1.2.2 Main study

In the second phase, the main study, I recruited eight participants, and began using purposive sampling. In purposive sampling, participants are selected according to the particular characteristics participants possess and who will better be able to assist with the research (Etikan, Musa & Alkassim 2016). I used the same criteria, older adults who were 65 years and over, who were regular users of mobile devices and who lived in a regional town of Queensland (Australia). However, during the purposive sampling process I made sure I had a similar number of female and male participants, to ensure both genders were equally represented in the study. Further, I chose three participants whose age was 70 years and over, as most participants in the pilot study were 65. These older adults' experiences helped me to not just know if new challenges and needs emerged as they are getting older, but also to discover more categories such as *Learning*, which shows that learning and knowledge acquisition is important to participants. Participants described how they learn through their experiences with information using mobile devices, and their interest in learning remains and is a crucial part of their daily lives throughout their ageing process.

Participants in the main study were recruited using flyers. These were included in public spaces such as public libraries, retirement villages, community health centres, fitness centres and shopping malls. Advertisements to participate in this research were placed in relevant newspapers (e.g., Seniors newspaper), websites (e.g., About Seniors, Brisbane Seniors Online) and newsletters (e.g., Rotary Clubs, Probus Club, Senior Citizens Associations). An electronic version of the recruitment flyer was posted on social media (e.g., Twitter, Facebook, LinkedIn) from my social media accounts and also from USQ social media accounts. A link to information about the research on my website (https://gemalinares.wordpress.com/research/) was included in the flyers, advertisements and social media posts. Flyers provided information about the purpose, procedures and benefits of their participation in the study. Also, the necessary requirements in order to participate in the study were specified. In addition, flyers advised how to contact me if they agreed to participate in the study. Finally, information about a small incentive for their participation, which was offered to all participants at the end of each interview, was included in the flyers. The

recruitment flyer and social media recruitment messages are in Appendix B. These recruitment methods were considered the most suitable according to the features of the population to be researched. It enabled informed consent, which clarified that confidentiality was assured. It also included written information about the aim of the study and the details of whom to contact for further information regarding the study (Soraghan, Hermann & Boyle 2013).

3.4.1.2.3 Theoretical sampling and sample size

Theoretical sampling refers to 'seeking pertinent data to develop your emerging theory' (Charmaz 2006, p. 96). Theoretical sampling is a way to achieve theoretical saturation. In Grounded Theory, data collection and analysis take place simultaneously until theoretical saturation has been achieved. Theoretical sampling is achieved when no new categories emerge from the data and new data does not add to the understanding of categories already articulated. When engaging in theoretical sampling, the researcher seeks people, events or information to illuminate and define the boundaries and relevance of the categories. I did not use theoretical sampling in this study as it was not needed; I reached the theoretical saturation using the sampling and recruitment outlined in the preceding section.

With respect to the size of the sample, in Grounded Theory it is based on how many participants are required to reach theoretical saturation (Charmaz 2006). Previous doctoral studies using this method to explore information literacy have used from 11 to 14 participants (Lloyd-Zantiotis 2005; Harlan 2012; Miller 2014). In this study, I achieved theoretical saturation with 12 participants.

3.4.2 Data collection

Data were collected using semi-structured in-depth interviews. I interviewed four participants in the pilot study. These four interviews were conducted in person, face-to-face. In the main study, I interviewed eight participants. Two of these interviews were conducted using a video and audio videoconferencing tool on the Internet (Zoom). In total, I conducted 12 interviews and data collection stopped when the categories were saturated. Table 3.2 summarises the interviews and includes information about each participant.

3.4.2.1 Interviews

Kvale (2008, p. 11) defines the interview as:

> *...a conversation that has a structure and a purpose determined by the one party – the interviewer. It is a professional interaction, which goes beyond the spontaneous exchange of views as in everyday conversation and becomes a careful questioning and listening approach with the purpose of obtaining thoroughly tested knowledge (Kvale 2008, p.11).*

According to Seidman (2006, p. 8), interviewing 'is a basic mode of inquiry' and the purpose of in-depth interviewing is to understand 'the lived experience of other people and the meaning they make of that experience' (Seidman 2006, p. 9). Furthermore, one of the appropriate techniques in the processes of eliciting information about the technology needs of older adults is talking methods (Malik & Edwards 2012). Talking methods, such as interviews or focus groups, give us information about the ways in which people represent themselves and the world in the context of a conversation. In addition, an appropriate technique in interviewing is extremely important in order to understand the emotions of older adults regarding their rejection of technologies (Mikkola & Halonen 2011).

STUDY	PARTICIPANT	MODE	VENUE	DURATION
Pilot study	Anne	Face-to-face	Refectory of USQ	29 minutes
	Louise	Face-to-face	The Library Café of State Library of Queensland	30 minutes
	Ben	Face-to-face	Participant's home	32 minutes
	Rose	Face-to-face	Participant's home	21 minutes
Main study	Betty	Face-to-face	Participant's home	50 minutes
	Peter	Face-to-face	Meeting room at University of Southern Queensland	1 hour, 3 minutes
	Emma	Face-to-face	Interviewer's home	52 minutes
	Ray	Face-to-face	Participant's home	43 minutes
	Marc	Face-to-face	Participant's home	40 minutes
	Michael	Face-to-face	Interviewer's home	50 minutes
	Sue	Zoom video call	Participant's home (via Zoom)	57 minutes
	Claire	Zoom video call	Participant's working place (via Zoom)	41 minutes

Table 3.2 Summary of participants' interview information.

The interview is the most widely adopted technique by grounded theorists (Charmaz 2006). Charmaz states that the reason for choosing interviews as the primary technique of data collection is derived from the research problem (Charmaz 2006, p.15). The research problem focused on how older adults experience information literacy using mobile devices. Hence, it made sense to obtain data from the source with experience of the phenomenon: the older adults.

Thus, semi-structured in-depth interviews were considered an appropriate choice for the current study because of the suitability in obtaining information about people's views, opinions and experiences (Charmaz 2006). Also, interviews enabled participants to describe their experiences of the phenomenon in their own words. Since Constructivist Grounded Theory focuses on researching the experience and actions of the participants, then interviews are the best tool for obtaining data (Charmaz 2014, p.58).

According to the constructivist perspective, the interview is a construction between researcher and participants (Charmaz 2006), where they construct meaning jointly (Charmaz 2014, p.59). Also, I used in-depth interviews because they fulfil the interpretivist worldview, which allows us to explore the participants' context, emotions and interactions (Charmaz 2014, p.58).

Finally, another reason for using interviews is that previously researchers have used interviews as a data collection method in their Constructivist Grounded Theory studies about library and information science, and information literacy. Some examples are Harlan (2012) and Miller (2014). Thus, there is evidence to suggest that interviewing is a successful technique in these fields.

3.4.2.2 Developing the interview questions

In order to systematically gather empirical data for about the information literacy experiences of older adults using mobile devices, an interview guide and interview questions were developed. The interview guide is available in Appendix C. According to Charmaz's Constructivist Grounded Theory, the interview guide

provides a limited number of open-ended questions, allows flexibility in the conversation, and also 'by creating open-ended, non-judgmental questions, you encourage unanticipated statements and stories to emerge' (Charmaz 2006, p. 26).

Further, the following considerations related to the age of participants, according to Zainal, Razak and Ahmad (2013), were taken into account. The interview began with a brief background to the study. This helped contextualise the focus of the question and their response in order to get in-depth information about a topic. A main open-ended question was asked and general probing questions were used about the participant's history of mobile device use, in case this did not come up in the conversation. Charmaz (2008, p. 143) explains that Constructivist Grounded Theory examines historical locations, and social circumstances. These kinds of questions prompted more reflection and conversation, and were considered in the study depending on conversation flow. Examples of background probe questions include: How do you learn to use this device? Why did you consider that it's important to start using the tablet/smartphone? Additionally, during the interviews, some new questions emerged based on participants' responses. I engaged in qualitative interviewing techniques such as active listening, reflection and paraphrasing during the interviews (Charmaz 2006).

Thus, interviews were semi structured with one main open-ended question, as is common in Constructivist Grounded Theory interviews. The emergent nature of Grounded Theory interviews means a single interview question and probing or follow up questions may be enough to elicit relevant stories from the interviewee (Charmaz 2006). Charmaz states that the 'first question may suffice for the whole interview if stories tumble out' (Charmaz 2006, p.29). This approach of using a single open-ended question is based on Charmaz's method of 'informal conversational interviews'. The researcher walks with the participant down a path while directing them towards a storyline.

The single open-ended question used was: *Can you tell me how you use your smartphone and/or tablet?* This question was developed based on the purpose of the study which was focused on exploring how older adults experience information

literacy using mobile devices as part of everyday life. The term 'information literacy' was not included in the interview question because it is not well known outside university and research circles, and can be confusing for participants (Maybee 2006). Recent information literacy studies have tended to not use this term (Yates 2013; Abdi 2014; Demasson 2014). The constructivist approach emphasises the participants' contexts, their 'language, meanings, and lives' (Charmaz 2006, p. 32). Thus, constructivist grounded theorists avoid specialist terminology, or jargon, that may be unfamiliar to participants, instead exploring the words the interviewees use and probing to develop an understanding of their meaning for the participant. Thus, where necessary, probing questions were used to prompt participants to explore their information literacy experience, without using the term 'information literacy'. The following probing questions were used in the pilot and main interviews in order to allow participants to elaborate their responses: Can you explain that further? Could you tell me more about that? What do you mean by that? Why is that important? Could you give me an example?

I conducted an initial pilot study in order to test, analyse and fine-tune the interview process and the question, to identify possible problems which might occur using proposed method, and to consider the procedures and changes to be made in order to improve the process in the main study. Four participants took part in an in-depth, semi-structured, face-to-face interview. Following the pilot study, I reflected upon my interviewing skills, to include notes pertaining to context and initial impressions, and to consider ongoing refinement of main study plans. Reflections on the pilot interviews are available in Appendix A.

Many of the interview reflections have been drawn from my memos. Reflections or memos of each interview were written and stored as separate files on my laptop named by date of file creation and a suitable name. Memos included reflections before and after the interview, and thoughts about the study in general. The reflections are focused on the conduct of the interview and the learnings gained. Also, the main purpose of these reflections is to solve any obstacle or problem of the interview process in the study and make changes to improve the interview process in the future.

The pilot study confirmed that face-to-face interviews allowed ease of conversation and helped me to raise the level of confidence and comfort, establishing reciprocity and a feeling of equality between myself and the participants (Birks & Mills 2011, pp. 56-57). Although these interviews were held at a time and location of the participant's choice, the places chosen by participants were noisy, which made the task of transcribing the interviews difficult. Subsequently, conducting interviews in places with background noise was avoided.

The pilot study was highly valuable for testing and fine-tuning the research instrument and data collection process. Although coding and data analysis had not started, interesting initial observations were made from the pilot interviews. The first two interviews showed that my interviewing skills needed to be improved. I was concerned about leading the participant with questions, and was too focused on this to allow me to effectively manage the interview. It is necessary for the interviewer to be an active listener, to follow-up the interviewee but not interrupt them. In case of an interesting point, I noted down keywords and asked more questions, thus encouraging the participant to expand the conversation; additional questions such as "why" and "how" were useful to clarify significant points.

Much of the interview provided information about how participants used their mobile devices instead of exploring information literacy using their mobile devices. Hence, I conducted a second round of pilot interviews. Two participants were interviewed focussing on their information literacy experiences with their mobile device and not just their use of the device generally.

In the pilot study, one of the participants had her smartphone with her in the interview, which helped to stimulate reflection and conversation, and the participant demonstrated how she used it. Thus, I ensured that the next participants took their mobile devices with them to the interview in order to help tap into the phenomenon. At the end of the pilot interviews, in consultation with my principal supervisor, it was also determined that more information literacy related probing questions were needed in order to explore the participants' information literacy experiences using their mobile devices.

3.4.2.3 The interview procedure

Ten interviews were conducted in person, face-to-face, and two interviews were conducted using a video and audio videoconferencing tool on the Internet (Zoom), audio-recorded using two devices (smartphone and tablet). The recording equipment was tested in the interview setting prior to commencement of the interview to minimise the risk of losing interview content in the event of device failure. The interviews were transcribed manually. The interviews were semi structured, with one main open-ended question, as is common in Constructivist Grounded Theory interviews. The emergent nature of Grounded Theory interviews means a single interview question and probing or follow up questions may be enough to elicit relevant stories from the interviewee (Charmaz 2006). Charmaz states that the 'first question may suffice for the whole interview if stories tumble out' (Charmaz 2006, p.29).

There was no pre-determined length for the interviews and participants were free to continue talking for as long as they wished; although it was anticipated that interviews would be between 20 and 60 minutes in length. The general aim of the interviews was to develop an understanding of the main ways each participant uses information (e.g., information literacy) using their mobile devices.

Procedures for interviews were laid out in writing and were clearly explained to participants before the interviews. Furthermore, it was ensured that basic human rights such as autonomy, informed consent, privacy, and data protection were protected (Borges et al. 2008). Participants were provided informed consent which identified that confidentiality would be assured, included written information about the aim of the study and contact details for further information regarding the study. All the participants were given information about their right to withdraw at any time with no personal consequences, and that participation was voluntary. The study was performed in accordance with the declaration of ethical principles (Borges et al. 2008).

Interviews were held at a time and location of the participant's choice. This helped to raise the level of confidence and comfort, establishing reciprocity and a feeling of equality between researcher and participant (Birks & Mills 2011, pp. 56-57). Finally, at the end of the interview session, I thanked the participants for their contribution to the research, their time and, in some cases for sharing personal information.

3.4.3 Data analysis

Data analysis was done simultaneously with data collection (Glaser & Strauss 1967; Charmaz 2006). Interviews were transcribed verbatim and these transcripts provided the data used for analysis. Hence, the analysis process was grounded in the interview data. I spent time listening to the audio recordings and reviewing the transcripts. I noted down immediate thoughts and reactions after each interview. Transcription enabled the identification of elements not represented by text and the role they played within the interaction with the participants. Furthermore, the process of transcription exposed defects in the interview process that were corrected during the next interview. This helped me to improve my skills throughout the study.

3.4.3.1 The phases of Constructivist Grounded Theory analysis

Charmaz (2014), points out four data analysis phases in Constructivist Grounded Theory:

- Coding: Initial and focused coding
- Memo-writing
- Theoretical sampling, saturation and sorting
- Theory development

This study follows these phases and also a constant comparative method, which involves making comparisons during each stage of the analysis (Charmaz 2006, p. 5). These phases are not linear and are inter-connected. I moved between initial and focused coding phases. I returned to revise codes created in the initial coding phases as I was advancing in the focused coding phase. Further, I wrote memos across all research process phases. In the next section I provide an overview of all four data analysis phases, it begins with a discussion of the constant comparative method and how this informed the data analysis approach.

3.4.3.2 Constant comparative method

The constant comparative method constitutes the core of the Grounded Theory methodology. Making comparisons between data, codes, and categories advances the conceptual understanding because analytic properties of categories are defined and then begin to subject these properties to rigorous scrutiny (Charmaz 2006, p.179). Thus, in this study I used constant comparative methods, giving credibility to the research. In this study I compared data with data, data with codes, codes with codes, codes with categories, categories with categories, and categories with concepts. All interview transcripts were thoroughly coded and checked against the categories formed from the constant comparison technique. Thus, comparisons were made across each stage of analytic development of the research.

3.4.3.3 Coding

Interviews with participants were the only data source. Interacting with interview data provided the richest site for analysis, and the process of constant comparison of data yielded a variety of insights that began during the interviews and continued throughout the writing process. After each interview with participants, I wrote memos and made notes about their thoughts and reactions. These reactions or thoughts were focused on concepts that participants demonstrated some interest or excitement about during the interview, indicated by the tone of their voices, longer replies, or interest in learning more about the concepts. Also, memos were used to design customised questions for the follow-up interview.

After the data collection for the first two participants had finished, I began to transcribe the interviews manually and after the first four participants were interviewed I started the first analytic phase, i.e. coding. According to Charmaz (2006, p. 46), coding is:

> *the pivotal link between collecting data and developing an emergent theory to explain these data. Through coding, you define what is happening in the data and begin to grapple with what it means (Charmaz 2006, p.46).*

Coding in Constructivist Grounded Theory is conducted in at least two main phases, initial and focused coding (Charmaz 2006, p. 42).

3.4.3.3.1 Initial coding

During this phase of data analysis, the most important words or groups of words were identified, analysed and finally labelled. It required a thorough reading of the data. Themes and topics were coded line by line and paragraph by paragraph. Codes are significant words or groups of words that are themselves used as labels. Codes were constructed to define what was happening in the data, which categorised actions and processes. Actions are both, the activities and the strategies, employed by participants. Processes are the collection of actions. In coding, the actions and processes are shaped by how a participant has understood their actions. However, the codes allow us to begin to conceptualise the theory (Harlan 2012).

During the initial coding phase, Charmaz (2006, p.49) suggests use of Glaser's technique of coding using "gerunds", constructing "-ing" words to signal activities in the data, with the aim to conserve the core of what is happening and what the participants are actually doing. Thus, I used "gerunds" to code and to focus on describing the actions of the participants. I also used 'in vivo coding' during this phase. In vivo codes are defined by grounded theorists as codes of participants' special terms (Charmaz 2006, p. 55). 'In vivo codes help to preserve participants' meanings of their views and actions in the coding itself' (Charmaz 2006, p. 55). Using 'in vivo coding' helped me to expose properties of an individual's experiences. Participants could use different terms to describe the same process, each different term could describe a different property of the action. Thus, I also explored the differences in in vivo codes in order to develop more focused codes and begin to categorise the data.

As mentioned previously, the data analysis started after the data collection with the fourth participant finished. I had four transcripts to be coded in the first round of initial coding. All four transcripts were coded line-by-line. Initial coding of these four transcripts resulted in 616 codes. After I finished coding the first four transcripts, I recruited six more participants, transcribed the interviews immediately after each interview, and coded the transcripts. In total, initial coding of the first ten transcripts resulted in 2121 codes.

During this process of initial coding I was focused on describing actions. I also tried to keep my mind open, without any expectations about what I would find in the data following the guideline by Charmaz (2006). I used Microsoft Word to code the first ten transcripts, using comments to describe action statements at the phrase and line levels. As mentioned previously, I used gerunds and in vivo codes wherever possible, using the participants' language to describe the actions I had seen in the data. After that, I exported codes, references, corresponding data source file name and text position to a spreadsheet on Excel in order to sort these codes and to generate new codes in the next steps.

At this point, I realised that I had reached the point where I needed to begin compiling a code book, sorting and removing some duplicate codes. I also found that Microsoft Word and Excel made it difficult to see the codes in the context of the other codes and did not allow me to work easily with the codes. Thus, after a discussion with supervisors, I began to use the qualitative research software NVivo.

3.4.3.3.2 Using NVivo as qualitative data analysis research software

I used NVivo 11 Pro for classifying, analysing and synthesising the data collected. It was used mainly as a research document organisation tool to visualise relationships between data. Further, this program helped me to: develop themes (nodes) from initial coding, memos and research literature; identify and visualise links between nodes; discover new concepts; and write documents based on concepts and findings from the analysis.

NVivo helped me to analyse and compare my codes with data in the interviews and verify if the code meant exactly what a participant had said in the interview, as it allowed me to see the sources and the references for each code. This feature facilitated the process of comparing data to data, data to codes and finally the comparison between codes.

Also, I was able to see the number of participants that had talked about the same thing. Figure 1: Displaying Sources and References in NVivo shows that nine

participants talked about how their mobile devices became an integral part of their lives.

Nodes

Name	Sources	References
Becoming mobile devices an integral part of his-her daily life	9	22
Becoming Laptop, Tablet and Smartphone as an integral par	1	1
Becoming mobile devices an integral part of his way of life	1	1
Using Tablet everyday	1	1
Carrying his Smartphone everywhere	1	1
Using Smartphone all the time	1	1
Becoming his Smartphone an integral part of his daily life	2	2
Becoming her Smartphone an integral part of her daily life	2	3
Becoming Smartphone an integral part of his-her daily life	4	4
Becoming Smartphone and Tablet an essential part of his da	3	4
Becoming Tablet an integral part of his-her daily life	2	4

Figure 1. Displaying sources and references in NVivo

This data (Sources=Number of participants) was useful as it allowed me to detect which themes should be probed more in future interviews. It also informed me of emerging initial categories, themes that emerged in most of the interviews.

When I transferred my codes into NVivo 11 Pro, firstly I was able to detect duplicated codes and very similar codes whose meaning was the same. This reduced the number of codes from 2121 to 2003. The process was time-consuming, but it helped me to review my codes and recode by creating new codes where it was necessary, selecting terms as codes whose meaning described the content of the words and expressions of each participant accurately. After transferring my codes to NVivo and cleaning the duplicate codes, where I used different words to express the same concept, I began to sort and group the codes into new codes according to their meaning.

The result was 2506 codes sorted into 185 main groups, with a further 287 ungrouped codes. Initially I had 2003 codes, but I created new codes in order to sort the initial codes and some of the initial codes were assigned to more than one new code. Thus, I needed to review and synthesise the codes in a second round of sorting.

During this code sorting process, I had some difficulties and started to wonder if some codes should be sorted in different groups or just in one according to its meaning. Thus, I spent a lot of time thinking and analysing their meaning. Some

codes provided information about different themes. For instance, the code "Finding very convenient to use Smartphone for keeping in touch with family and friends" provided information about the characteristics of mobile devices (it is convenient) and also about its use (it is used for keeping in touch with family and friends). Thus, it could be assigned to more than one new code. I then compared the code with the content in the text:

> *Gema: Why do you use your smartphone to keep in touch with your family and friends and no other ways to communicate with them?*
> *Emma: Yes, it's just convenient. It's very convenient (Emma)*

Finally, I decided to assign it just to one new code "Characteristics of mobile devices" because the meaning is focused on the characteristics of smartphones.

Further, I had difficulty sorting some initial codes according to their meanings. In this case, I decided not to sort them into new codes. I had codes whose theme was revealed in just one code, for example, the code "Evaluating Apps before deciding to use them". In these cases, I decided to wait to do more interviews where this theme could be explored further.

Also, I realised that some code groupings were much broader than other code groupings and there were a considerable number of ungrouped codes. Thus, I spent time refining my code sorting, to verify that I had done as much grouping as possible. The result of this process was 170 main groups and 16 ungrouped codes. Some interesting data began emerging during this process and it was clear that some topics needed to be explored more in depth.

Thus, after cleaning, sorting and grouping the codes of the first 10 transcripts, it became apparent that the codes had not reached saturation point. After a discussion with my supervisors, I decided to recruit two more participants. Once I interviewed these two participants, I transcribed the interviews manually and coded them. I tried to apply existing codes where it was possible and remained open-minded to the emergence of data whose meaning did not fit into the existing codes. At the close of initial coding I had 193 main groups and 19 ungrouped codes.

3.4.3.3.3 Focused coding

Charmaz (2006, p. 57) states: 'focused coding means using the most significant and/or frequent earlier codes to sift through large amounts of data'. In this phase, I coded the interviews in more detail, and started to synthesise and explain larger segments of data. Charmaz (2008, p. 164) states: 'Grounded theorists scrutinize their focused codes to evaluate which ones best explain or interpret the empirical phenomenon. These codes then become tentative theoretical categories'.

This more intensive coding was combined with the initial coding, which led to another comparison of the data. Codes were examined for how they related to one another and similar codes were explored in the data. Focused coding is another look at the data, but this time in order to discover where codes occur that may have been missed in the initial coding.

In this phase I began sorting codes into more abstract groups, as codes developed in this phase are more conceptual than the initial codes (Charmaz 2014). I compared data with data, and data with codes. I created new codes and groups. The codes that I created described themes that emerged frequently across the different data. I tried to refine the groups of codes by making groups more precise according to the information they provided. Also, I revised the name and terms of each code and group of codes in order to verify that their meanings fitted into each group. As result, I modified some groups of codes and I created new ones. As result, I had 41 groups of codes. These groups of codes were rethought and I could see some tentative categories forming. When I finished focused coding, I sorted the codes in two different groups:

- Group 1: Categories (7 tentative categories):
    - Ageing
    - Communicating
    - Consuming and creating content
    - Enacting everyday life
    - Learning to use and managing mobile devices
    - Learning and staying mentally active

    - Managing relationships
- Group 2: Information-related code groups (11 groups):
    - Analysing information
    - Becoming better informed
    - Being overwhelmed by information
    - Evaluating the reliability and quality of information
    - Finding information
    - Getting advice
    - Having ready access to information
    - Keeping informed
    - Managing information
    - Perceiving the importance of being informed and the role of information in their daily lives
    - Sharing information using mobile devices

In the end, Group 1 (seven tentative categories) merged into six categories, and the information-related groups collapsed into eight code groups.

3.4.3.4 Memo writing

Memo writing is a distinct contribution of Grounded Theory (Charmaz 2009, p. 166). According to Charmaz (2006, p. 72) memo writing constitutes 'a crucial method in Grounded Theory because it prompts you to analyse your data and codes early in the research process'. In this study, I wrote memos after each interview, during coding phases, and also during theory construction. Memos included not just words, but also pictures and tables. The use of sketches and mind maps in memos helped me to understand concepts and relationships.

Memo writing was undertaken manually, using pen and journal when I was outside, and also electronically using Microsoft Word when I was at home, to write down any emerging ideas during data collection and analysis periods. I wrote emerging ideas and reflexive thoughts throughout the research process, from the beginning of data collection to the development of a final theory.

I wrote memos after each interview which was useful to help me think and reflect on issues, concerns, and ideas which could improve my interview technique and get better data, by refining or adding new questions in the following interviews. An example of an interview memo is in Appendix D.

Furthermore, writing memos can provide reflexivity, which enhances the quality of the research. Reflexivity is about how the experience, feelings and interpretations of the researcher affect any knowledge claims that the researcher makes. I provide a broader definition of reflexivity by Charmaz (2006, p. 188-189) on page 75.

Thus, I also wrote reflective memos during the coding and analytic process, which helped me to analyse in depth my thoughts and ideas about my data, codes and categories. Through writing memos, I produced analytic notes, not just to scrutinise data and define codes, but also to explain and fill out categories. Memos helped me make comparisons between data, codes and categories. Also, memos helped me to think about the data and discover new ideas. In short, memos increased my level of analysis of ideas, data, codes and categories by stimulating my analytic research work and improving my productivity.

3.4.3.5 Theoretical sampling, saturation and sorting

In this section I describe the theoretical sampling, saturation and sorting phases in Constructivist Grounded Theory.

3.4.3.5.1 Theoretical sampling

As stated earlier, theoretical sampling refers to 'seeking pertinent data to develop your emerging theory' (Charmaz 2006, p. 96). Theoretical sampling is a way to achieve theoretical saturation. Theoretical sampling is achieved when no new categories emerge from the data and new data does not add to the understanding of categories already articulated. I did not use theoretical sampling in this study as it was not needed; I reached theoretical saturation using the sampling and recruitment outlined above.

3.4.3.5.2 Theoretical saturation

Charmaz (2006, p.189) describes theoretical saturation as 'the point at which gathering more data about a theoretical category reveals no new properties nor yields any further theoretical insights about the emerging Grounded Theory'. This study reached theoretical saturation when new data did not generate new properties or theoretical insights of core categories. However, Glaser and Strauss (1967) recognised a lack of clarity in saturation, writing that the 'published word is not the final one, but only a pause in the never-ending process of generating theory'. This suggests that at any point one may return to the data or collect additional data and discover new information about a core category. Charmaz (2006) emphasises that researchers should remain open, often going back to recode earlier data. Thus, according to the suggestion of Charmaz and struggling with the concept of saturation, I coded and recoded the interviews numerous times. I refined the definitions and concepts as result of coding and recoding, which allowed me to explore the properties within a category.

3.4.3.5.3 Theoretical sorting, diagramming and integrating

According to Charmaz (2014, p. 216) sorting, diagramming and integrating memos are interrelated processes and these strategies are used by grounded theorists in the theoretical development of their analysis. Sorting provides a logical way to organise the data analysis, and create and refine theoretical relationships by making researchers compare their categories (Charmaz 2014, p. 216). I stopped writing memos in the code sorting process and started writing up the categories. Thus, I wrote and sorted at the same time. I had developed tentative categories in written reflective memos, in which I analysed my thoughts focusing my attention on the research phenomenon, by scrutinising what participants experience as information literacy, what participants find informing, what participants do with information, what are participants' information use experiences such as actions, emotions and attitudes in order to make sense of the phenomenon. As result of this writing and sorting process I discerned and scrutinised the relationships between categories more clearly.

Diagrams help to give a concrete visual representation of categories and their relationships (Charmaz 2014, p. 218). In this study, a diagram was not created due to the complexity of relationships. I considered that the relationships between categories would be better represented in a table than a diagram due to the number of relationships between them. The table where the relationships between categories are shown is available in Chapter 5.

3.4.3.6 Theory development

The ultimate aim of a Grounded Theory study and the last stage of data analysis in Constructivist Grounded Theory is to produce new theory that is grounded in data collected directly from participants on the basis of their lived experience (Fassinger 2005). As this is a constructivist interpretative study that aims to develop in-depth understanding rather than explanation, Grounded Theory is an interpretation of the data generated from the participants (Charmaz 2006). In this Constructivist Grounded Theory study, theory development advanced during each step of data collection and analysis, and an interpretative theory that reflects participants' information literacy experience using mobile devices was co-constructed by the participants and the researcher.

According to Charmaz (2014, p. 231) interpretative theory aims to:

- Conceptualise the studied phenomenon to understand it in abstract terms
- Articulate theoretical claims pertaining to scope, depth, power, and relevance of a given analysis
- Acknowledge subjectivity in theorising and hence recognise the role of experience, standpoints, and interactions, including one's own
- Offer an imaginative theoretical interpretation that makes sense of the studied phenomenon (Charmaz 2014, p. 231)

In Grounded Theory methodology, theory development involves an inductive and iterative process of constructing categories that can be explored through theoretical sampling in data generation (Charmaz 2006). However, I used an inductive and abductive method, as I collected and analysed my data simultaneously. According to Charmaz (2014, p. 201), researchers use an abductive method when they remain

theoretically open to 'all possible theoretical interpretations of the data but maintain a critical, sceptical stance toward these theories'. Thus, I collected data, compared them and kept open to any theoretical understanding of my data. I developed provisional interpretations about these data through my codes and initial categories formed. Afterwards, I went back to collect more data to verify, confirm and refine my initial categories. Hence, I developed theory through the constant comparative method and I refined my theory through the collection of more data. In this sense I understand Grounded Theory as a combination of both an inductive and abductive method. I developed my theory inductively and I tested my thoughts and ideas all the time during the whole process (abductive process). Hence, I agree with Charmaz (2006) who states that Grounded Theory is simultaneously an inductive and abductive method.

I did not find it easy to understand what it involved to construct a theory. I did not find guidelines or manuals on how to theorise or create a theory. Chamaz does not provide explicit information on how to practice theorising or how it occurs. I realised that I was constructing a theory when the theorising was almost finished.

According to Charmaz (2006, p. 135) theorising is defined as 'stopping, pondering and rethinking anew' and it involves 'seeing possibilities, establishing connections, and asking questions' (Charmaz 2006, p. 35). Further theorising requires an 'imaginative understanding of the studied phenomenon' (Charmaz 2006, p. 126). This task was challenging, however as I wrote memos throughout each phase of data collection and analysis, by writing up memos in the coding process with one memo for each initial category, it helped me to scrutinise the phenomenon and to understand it, to identify possibilities and examine them, to find and create diverse connections and finally it helped me to ask questions of my data.

Once the nascent categories were constructed, I looked at the codes in NVivo and verified if the codes were relevant and fitted into the categories that I had created. I had an open mind, in order to not force the codes into the categories that I had created. I compared the categories with the data. I re-coded each participant's transcript with the categories, to test if the categories reflected the participant's experience accurately. As result of this process, I created a substantive theory that

works and reflects older adults' information literacy experience using mobile devices.

3.4.4 Maintaining quality in Grounded Theory research

In qualitative research, reliability (expressed as dependability by Lincoln and Guba (1985)) and credibility are essential criteria for maintaining quality in all research studies. In Constructivist Grounded Theory the meaning and the theory are constructed throughout the relationships between the researcher and the research participants. Hence, the theory is constructed as result of these relationships, which need to be documented in depth. For that, I used memos in order to give evidence and maintain the quality and credibility of the data collected from research participants (Charmaz 2006). Furthermore, in Grounded Theory data are checked through a process of constant comparative analysis by providing reliability to the research.

However, Grounded Theory, like other qualitative research methods, is open to the possibility of error. Charmaz suggests the following evaluative questions in order to assess the quality of the study, and they were mentioned in the research:

- Are the definitions of major categories complete?
- Have I raised major categories to concepts in my theory?
- How have I increased the scope and depth of the analysis in this draft?
- Have I stablished strong theoretical links between categories and between categories and their properties, in addition to the data?
- How have I increased understanding of the studied phenomenon?
- What are the implications of this analysis for moving theoretical edges? For its theoretical reach and breadth? For methods? For substantive knowledge? For actions or interventions?
- With which theoretical, substantive, or practical problems is this analysis most closely aligned? Which audiences might be most interested in it? Where shall I go with it?
- How does my theory make a fresh contribution? (Charmaz 2006, pp. 155-156).

Charmaz (2006) also reasserts the importance of applying four criteria in accordance with purpose and context: Credibility, originality, resonance and usefulness. I used these criteria as the basis for reflection and note taking during all key phases of the study, such as data generation, data analysis and theory development. These four criteria are outlined below.

3.4.4.1 Credibility

Credibility reflects logic and conceptual grounding. Charmaz suggests these questions in order to assure credibility:

- Has your research achieved intimate familiarity with the setting or topic?
- Are the data sufficient to merit your claims? Consider the range, number, and depth of observations contained in the data.
- Have you made systematic comparisons between observations and between categories?
- Do the categories cover a wide range of empirical observations?
- Are there strong logical links between the gathered data and your argument and analysis?
- Has your research provided enough evidence for your claims to allow the reader to form an independent assessment - and agree with your claims? (Charmaz 2006, p.182)

3.4.4.2 Originality

Originality refers to the significance of the study. Charmaz develops the following questions to verify originality:

- Are your categories fresh? Do they offer new insights?
- Does your analysis provide a new conceptual rendering of the data?
- What is the social and theoretical significance of this work?
- How does your Grounded Theory challenge, extend, or refine current ideas, concepts, and practices? (Charmaz 2006, p.182)

3.4.4.3 Resonance

Resonance addresses the need for the theory to have meaning and sufficient scope for all those whom it may be relevant. Charmaz establishes these questions to probe resonance in the research:

- Do the categories portray the fullness of the studied experience?
- Have you revealed both liminal and unstable taken-for-granted meanings?
- Have you drawn links between larger collectivities or institutions and individual lives, when the data so indicate?
- Does your Grounded Theory make sense to your participants or people who share their circumstances? Does your analysis offer them deeper insights about their lives and worlds? (Charmaz 2006, pp. 182-183)

3.4.4.4 Usefulness

Usefulness refers to the relationship between the knowledge development and its practical application. In order to demonstrate usefulness in the study I asked these questions, following Charmaz:

- Does your analysis offer interpretations that people can use in their everyday worlds?
- Do your analytic categories suggest any generic processes?
- If so, have you examined these generic processes for tacit implications?
- Can the analysis spark further research in other substantive areas?
- How does your work contribute to knowledge? How does it contribute to making a better world? (Charmaz 2006, p.183)

Charmaz (2006) considers that credibility and originality spawn resonance and usefulness (Birks & Mills 2011, p. 150).

These guiding questions and evaluation criteria were chosen as most suitable for this study, as they reflect the interpretivist Constructivist Grounded Theory approach. These criteria were used as the basis for reflection and note taking during all key phases of the study, such as data collection, data analysis and theory development. I also responded to these questions once the inquiry was completed, in order to assure quality in the research. These questions helped me to verify the outcomes and know

if this research applied Constructivist Grounded Theory correctly and contributed new knowledge.

In addition, the research embraced the concept of reflexivity. Reflexivity is defined as:

> *The researcher's scrutiny of her research experience, decisions and interpretations in ways that bring the researcher into the process and allow the reader to assess how and to what extent the researcher's interests, positions and assumptions influenced inquiry. A reflexive stance informs how the researcher conducts his or her research, relates to the research participants, and represents them in written reports (Charmaz 2006, pp.188-189).*

Charmaz (2006) acknowledges an obligation for constructivist grounded theorists to incorporate reflexivity as a strategy in their research design in order to ensure the quality of research. This study applied the process of reflexivity in order to understand how both the contextual history of researcher and the contextual history of the data used affected any knowledge claims made. My memos provide written records of reflexivity, as the actions, feelings and influences on thinking of myself as the researcher (Birks & Mills 2011, p. 53).

Applying reflexivity, in this study I reread the coded interviews to analyse parts, contradictions or conflicting codes. Furthermore, I read memos to recall the instant reactions during and after the interviews, and also the discussions which I compared with the coding.

3.5 Ethical clearance

I obtained full ethical clearance of the research instrument and data collection from the USQ Human Research Ethics Committee (USQ Human Research Ethics Approval Number H15REA250). I performed the study in conformity with this approval. Participants were informed of the confidential nature of the interview and that all responses were considered anonymous. Each participant was informed about their right to withdraw at any time with no personal consequences, and that

participation was voluntary. Also, participants were given information about complaint procedures regarding the conduct of the research. This information was communicated prior to each interview and is on the Participant Information and Consent Form.

I applied the following strategies to protect the privacy and confidentiality of the participants:

- Participants were assigned pseudonyms in the transcripts and throughout the thesis.
- All data collected has been stored securely as per University of Southern Queensland's Research Data Management policy on a password-protected computer.

3.6 Conclusion

In this chapter I have provided an overview of the study's research design, including the research paradigm, research method and data collection and analysis techniques. I have also outlined how quality was maintained in the conduct of the study. In the following chapter I introduce the research participants.

4 Research participants

4.1 Introduction

In the previous chapter I described and discussed the research approach, the data collection and data analysis phases involved in this study, and also how this research has been conducted and implemented according to the Constructivist Grounded Theory methodology. In this chapter I introduce the research participants who took part in individual face-to-face interviews in this study. In addition, I provide a definition of mobile apps including a table with the mobile apps used by each participant in this study.

The participants are acknowledged, in this chapter, as essential contributors to this study and play a crucial role in the success of this research. The participants provide data and construct meaning, and thus facilitate the creation of the new theory which is the product of this research.

Twelve participants took part in this research. In order to preserve their confidentiality and anonymity, I assigned a pseudonym to each participant. I decided to use pseudonyms instead of alpha-numeric codes in order to humanise and personalise the participants.

The information of each participant draws on two sources. The first source was the Participant's profile (Appendix E) which was completed by each participant and returned to the researcher before the interview. It included some questions in order to verify that the participants met the selection criteria to participate in the study and to collect extra information that may not be mentioned in the interview. The second source of information was the interview.

Table 4.1 presents an overview of each participant.

NAME	AGE	MOBILE DEVICES USED BY THE PARTICIPANT	MARITAL STATUS	STARTED USING MOBILE DEVICES	PROFESSIONAL QUALIFICATION	EMPLOYED OR UNEMPLOYED	POSITION
Anne	65	Tablet	Married	9 months ago	No qualification	Employed	Administrative assistant
Louise	70	Smartphone	Unknown	4 years ago	Master's Degree in Social Work	Retired (She is still working as social worker)	Social worker
Ben	65	Smartphone / Tablet	Married	4 years ago	Degree in Christian ministry	Employed	Christian Pastor
Rose	65	Smartphone & Tablet	Married	Smartphone 4 years ago/ Tablet 2 years ago	No qualification	Unemployed	Housewife
Betty	66	Smartphone	Divorced	2 years ago	Certificate in aged care	Employed	Aged care worker
Peter	74	Tablet	Married	6 years ago	PhD Education	Retired (He is still working as academic)	Academic
Emma	66	Smartphone & Tablet	Widow	4 years ago	Photography studies	Retired	Photographer
Ray	70	Smartphone & Tablet	Married	5 years ago	B.A. Education	Retired (He is working as Pastor)	Pastor
Marc	86	Smartphone	Married	3 years ago	No qualification	Retired	----
Michael	65	Smartphone & Tablet	Separated	3 years ago	Master's Degree in Engineering Science	Retired	----
Sue	68	Smartphone & Tablet	Married	Smartphone 4 years ago / Tablet 5 years ago	Professional hairdresser	Employed	Packing in a factory
Claire	66	Smartphone & Tablet	Married	8 years ago	Diploma in Business	Employed	Garden designer

Table 4.1 Research participant's profiles

As it is shown in Table 4.1, three participants stated that they were retired but still working. Here, retired means that they have stopped working in regular paid employment because they reached the retirement age according to the government, but they work in casual and part-time jobs, or as volunteers.

4.2 Research participants

This section provides a background on the participants and their information literacy experience using mobile devices as part of their everyday life. Each participant is introduced through a vignette, which includes an avatar that I have created using the online avatar generator PNG & SVG Avatar Generator Online via the Face.co website at https://face.co (Carrero 2017). These avatars bear no resemblance to the features of the participants. Further I have considered it important to provide some background information about myself as co-constructor of this study, as the Constructivist Grounded Theory participants and researcher are seen as co-constructors of the research data and of a new theory.

ANNE

Mid Sixties

Married

Mobile device: ***Tablet***

Anne is in her mid-sixties and lives with her husband in a regional town in Queensland. She has been making use of her iPad for nine months. She doesn't have any formal qualifications. Due to her family's financial situation when she was young, she went into the workforce at 15. She wasn't able to complete her higher studies.

She has always been in retail. In 1984, she and her husband purchased their own business which they ran until 2011 when floods on the 10th of January 2011 destroyed it. From 2012, she has been participating in casual work at USQ in

Toowoomba. Her job involves archiving exams, supervising exams and organising graduation ceremonies.

She uses her iPad mainly for keeping in touch with her family, seeking information about travelling, managing her banking account, getting information about weather and playing games.

Although Anne considers her tablet to be a very good tool for communicating with others and accessing information and also, she pointed out the importance of learning to use these devices and using them in daily life if you don't want to get left behind by the younger generation. She recalled that she felt scared when she started using her tablet and revealed that she experienced difficulty, due to her lack of digital literacy skills.

In addition, Anne mentioned the significant role that her relatives, mainly her grandchildren and sons, play when she wants to learn how to use her iPad. They teach her how to use it.

LOUISE

Early Seventies

Mobile device: ***Smartphone***

Louise lives alone in Toowoomba and has been making use of her iPhone for four years. She got her Bachelor of Social Studies in 1967 and her Master of Social Work in 1992. Although she is retired, she still works as social worker.

Louise uses her iPhone primarily for making calls, checking personal and work emails, looking at information on the Internet and playing the game Anagram. She uses her iPhone mainly when she is away from home for keeping in touch with her family, seeking information about travelling, accessing her bank account, getting information related to the weather, and sharing photos with her relatives and friends.

However, when she stays at home she prefers using her computer because the font is small on the iPhone.

Louise mentioned her difficulties in accessing information using her iPhone. For instance, she has problems recognising the icons or remembering the steps to follow in order to do tasks with her iPhone. These challenges make her feel frustrated.

BEN

Mid Sixties

Married

Mobile devices: ***Tablet & Smartphone***

Ben lives with his wife in Toowoomba. He has been making use of both iPhone and iPad for four years. He has a Degree in Christian ministry and currently works as a Christian Pastor in a church located in Toowoomba.

He helps with social activities in his church. He teaches English language once per week in the church as part of his job. He also organises meetings with members of his community each Friday night to read and learn more about the bible. Also, he helps disadvantaged groups in Toowoomba.

Ben spoke a lot about how he makes use of his mobile devices in his job, considering them important tools to get, seek and share information. He uses specific apps related to his job. For instance, he uses an app to read and learn more about the bible. He also uses an English Language app to teach English to his students.

Ben pointed out how the use of these mobile devices has changed the way he accesses information, in a faster way and from anywhere. He considers that these devices are really useful and helpful tools, which improve how he works and his daily life. For this reason, he feels really motivated and interested in learning more about how to use them.

ROSE

Mid Sixties

Married

Mobile devices: ***Tablet & Smartphone***

Rose lives with her husband in Toowoomba. She has been making use of her iPhone for four years and her iPad for two years. She doesn't have any formal qualifications. She is a housewife and grandmother. She usually takes care of her grandchildren.

She prefers using her iPad, considering this device easier to use than her iPhone. She uses her iPad mainly for seeking information when she is going to travel, for planning, for listening to music, for reading, and she loves using her iPad for playing games. For her, it is a way of relaxation.

Rose shared feelings of frustration and insecurity, and was anxious, explaining: "I am not clever enough" (Rose) when she tries to use new apps, which are as yet unknown to her. These feelings hinder her learning and access to new apps or any other functionality that these mobile devices provide.

Currently, she just makes use of a few apps and she does not search on the Internet to access information. She feels very demotivated due to her feeling of frustration. Although Rose recognised the importance of using these mobile devices for older adults in their daily lives, she is not sure about wanting to learn more about them.

BETTY

Late Sixties

Divorced

Mobile device: ***Smartphone***

Betty is divorced and lives alone in Toowoomba. She has been making use of her iPhone for two years. She has professional qualifications in Aged Care and currently

she works as aged care worker in a retirement living and aged care services centre in Toowoomba.

She uses her iPhone mainly for getting and finding information when she is going to travel; for listening to music; for buying on-line; for learning Spanish and also for playing games, such as Scrabble or Solitaire. She pointed out that games help her to keep her brain working. Further, she loves accessing the social network application Facebook to stay in contact with her friends and family through the use of Messenger.

Betty shared that the use of her smartphone has changed her life: "Now, it can be a bit more knowledgeable" (Betty). She feels the necessity of learning and acquiring more information, and for this purpose, a smartphone helps her.

Betty recognised the importance of the use of smartphones by older adults in their daily lives and how necessary it was to keep their brains working when they are getting older. She claimed that smartphones can help them keep their brains working, and described smartphones as being helpful and convenient for them.

PETER

Early Seventies

Married

Mobile device: ***Tablet***

Peter is married and lives with his wife in Toowoomba. He has made use of his tablet for six years. He has professional qualifications in education (BEd, MEd and PhD). Currently he is retired, although he is still working as academic, and he has five doctoral students that he is supervising.

He uses his iPad mainly for communicating with people and finding information. Peter makes use of his iPad in his job, and considers it an important tool to learn and share information with his students and colleagues. He considers that one of the most important functions in his job is to find information and use this information in order

to learn, teach and be informed. The iPad allows him an easy and quick way to perform these tasks.

He uses specific websites, related to his research area and interests, such as Pascal Observatory and The Center for Lifelong Learning. Also, he makes use of diverse apps to get information about news (ABC, The Guardian, The Sydney Morning Herald), about world time, and about the price and booking of flights and hotels. Further, he uses his iPad for buying products on-line.

Peter expressed a feeling of shame because too many older adults don't make use of mobile devices and they could improve their quality of life. He thinks it is necessary to inform and convince them that the use of these devices could improve their everyday lives.

EMMA

Late Sixties

Widow

Mobile devices: ***Tablet & Smartphone***

Emma is widow and lives alone in her own home, in Toowoomba. She has made use of her tablet and smartphone for four years. She is a professional photographer, but currently she is retired.

She uses her tablet and smartphone mainly for communicating and keeping in touch with relatives and friends. Emma makes use of her smartphone in her everyday life and makes use of her tablet when she is on holidays. She considers that they are important and useful tools, to connect with young people and stay with the present century. She doesn't want to be left behind.

She uses her tablet and smartphone for listening to music, for watching movies on her tablet, and when she is on holidays for seeking information about accommodation, about weather and about her banking account. She also plays

games, such as Tetris, Spider Solitaire or Crosswords. Games help her to keep her brain working. Further, she loves using Facebook mainly to share photographs, and stay in contact with her friends and relatives.

The use of her smartphone and tablet makes her feel more comfortable in this generation and she feels that she is more connected with young people thanks to the use of these technologies: "I've got something that I can use straightaway. And it makes me more comfortable in this generation I feel that I've got more in common with younger people by using this technology" (Emma).

RAY

Early Seventies

Married

Mobile devices: ***Tablet & Smartphone***

Ray is married and lives with his wife in Toowoomba. He has made use of his tablet and smartphone for five years. He has professional qualifications in education (BEd). Currently he is a pensioner, although he works as pastor in a religious institution in Toowoomba.

He uses his tablet and smartphone mainly for personal and business communication, and also to get information. Ray spoke a lot about how he makes use of his mobile devices in his job, considering them important tools to get, seek and share information. These technologies are considered very important for him. He claimed: "My life is what I do and what I do, it can be only done if I have these items, these tools. Otherwise it would be impossible" (Ray).

He uses mainly communication apps such as WhatsApp, Viber, Messenger and Skype, and he just makes use of Google as a searching tool of information. He considers Google one of the easiest and quickest tools to get information: "Google knows everything" (Ray).

The use of his smartphone and tablet is "an important, confident, reliable, cheap way of communication" (Ray). He claimed that the use of these mobile devices has changed his life completely. His social, affective and work lives have improved considerably thanks to these new technologies.

MARC

Late Eighties

Married

Mobile device: ***Smartphone***

Marc is retired. He is married and lives with his wife in Toowoomba. He has made use of his smartphone for three years.

He uses his smartphone mainly to communicate with relatives and friends, to meet people, to search information (mainly about health), and to learn. Marc spoke about and showed his ability to use his smartphone in his everyday life. He considers that it is an important tool to communicate and socialise and also to get information in order to learn. Furthermore, the use of a smartphone is really important for him because it keeps his brain active: "It's good for me because it keeps me busy and also it keeps my memory fresh" (Marc).

He uses mainly communication apps like WhatsApp, Viber, Imo, Messenger and Skype, and he uses Google and YouTube as searching tools for information. He claimed: "I learn a lot from Google and from YouTube" (Marc). Marc prefers using YouTube to search information because it provides videos. He likes watching videos and movies through his smartphone.

Marc said that the use of his smartphone makes him feel very good and happy. He feels that he keeps busy and active thanks to the use of his smartphone.

MICHAEL

Mid Sixties

Separated

Mobile devices: ***Tablet & Smartphone***

Michael is separated and lives alone in Toowoomba. He has made use of his smartphone and tablet for three years. He has professional qualifications in engineering (Bachelor of Engineering (B.Eng.), Electrical, Electronics and Communications Engineering and Master of Engineering Science (M.Eng.Sc., Computer Engineering). Currently he is retired.

He uses his smartphone mainly to communicate with relatives and friends throughout phone calls and text messages, and to learn languages. For him, the best functionality of a smartphone is for communicating. He prefers making use of other devices, such as a digital camera and GPS because the quality is much better than that provided by the smartphone.

Michael claimed that he rarely makes use of some apps such as Google or Facebook on his smartphone to get and search information because it's easier for him to use the computer for that, due to the size of the screen and keyboard. According to Michael it is tricky to scroll on his smartphone to find the information, however it is not necessary to scroll on his computer because all information is on the screen. He said:

> *We can get onto Google Chrome which is a little bit like the computer. But you're just working with the small screen, so you can only see part of it you've got to scroll around and move it sideways. (Michael)*

Michael shared that the use of his smartphone has helped him to be a more sociable person. He claimed: "it's easier to contact people so you can arrange to meet them" (Michael).

SUE

Late Sixties

Married

Mobile devices: ***Tablet & Smartphone***

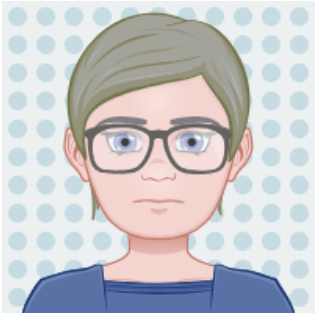
Sue is married and lives with her husband in a rural area in Toowoomba. She has made use of her smartphone for four years and she has made use of her tablet for five years. She has a professional qualification in hairdressing. Currently, she is retired but she is working as factory worker, packing fruit.

She uses her smartphone mainly to communicate with people through phone calls, text messages and WhatsApp. However, she makes use of her tablet far more that she uses her smartphone because of the size. Her smartphone is very small, and it is fiddly for her to write and read information on it. She makes use of her tablet for doing a many daily tasks, such as to control and transfer money or verify bills through her on-line bank account. Also, she uses her tablet to buy things, book flights and holidays, get information about important news, play games or find locations. Sue shared that the most important reasons to use her smartphone and tablet are "to be in constant communication with people and to have all the information that she needs on hand" (Sue).

Sue claimed that she would get lost without her smartphone and tablet. The use of these mobile devices makes her feel secure because she can communicate with people and she is contactable at any time from anywhere.

Sue pointed out the importance of using these mobile devices, especially by people who live far away or in rural areas as she does. She does not have to drive to buy something, to see her bank account or to visit the doctor, because she is able to do these tasks at home thanks to the use of her tablet.

Sue said that the use of her tablet and smartphone made her feel more informed and clever: "definitely you feel cleverer because you are learning all the time" (Sue).



CLAIRE

Late Sixties

Married

Mobile devices: ***Tablet & Smartphone***

Claire is married and lives with her husband in Toowoomba. She has made use of her smartphone and tablet for eight years. She has a professional qualification in Business and she is working as a garden designer in a family business.

She uses her smartphone mainly to communicate with people through phone calls and text messages. However, she makes use of her tablet far more that she uses her smartphone because of the screen's size. She sees and writes emails much better on the tablet than on the smartphone.

Claire claimed that although she knows that she could use her mobile devices for doing more things than what she uses them for, she makes use of them just for doing a few tasks. She makes use of a limited number of applications on her tablet. She keeps to what she knows, perhaps due to a feeling of not being able to use the devices for other things, as she said: "I'm reasonably tech-savvy to do what I need to do, but I'm not good at other things" (Claire).

She makes use of her tablet mainly for communicating with her children and grandchildren, who live far away, through the use of communication apps such as FaceTime and Messenger. The most important thing to her is to stay in touch with her children and see what her little grandchildren are doing.

Further, she uses her tablet as a job tool for communicating by email, taking photos of places she is drawing designs for, and getting information mainly of other companies (phone numbers and addresses) and plants. Claire claimed that she just gets information through the use of Google, and doesn't make use of other searches, specific applications or social media for getting information. She gets informed by reading papers and watching the news. She uses her tablet for getting information mostly related to her job.

Claire claimed that she prefers reading books and newspapers on paper rather than reading on the tablet because it's something that she has always done. However, she loves to read books and novels on her tablet when she is away, because she can take a lot of them stored on her tablet when she is overseas.

Claire considers it important to learn more about how to use her mobile devices. She claimed: "it is part of just keeping your mind active and trying to not be too far behind the children" (Claire). Thus, to keep her mind active and keep up with the youngest generations are important motives for learning more about how to use her tablet and smartphone by making her life easier.

GEMA *(the researcher)*

Early Forties

Married

Mobile devices: ***Tablet & Smartphone***

I am a qualified librarian, who holds a bachelor's degree in Library and Information Science and a master's degree in Library Research. Before starting my doctoral degree, I worked as an LIS professional for more than ten years in technical documentation centres, public, medical and law libraries, and also in historical archives in Spain.

I have seen during my professional career how new technologies have been incorporated gradually as crucial job tools in order to introduce a wide range of tasks into each role. The incorporation of these new technological tools such as laptops and tablets involved changes and a huge effort for workers, specially for those who were 60 and over, who had to learn and start using these technologies to execute their job tasks if they didn't want to lose their professional positions. Tasks such as the creation, search and interchange of information started to be done through these technologies, by substituting the traditional tools on paper. An example is the library card catalogue which has been substituted by the use of databases and enterprise content management platforms.

I felt empathy, as I am familiar with the feelings of fear and reluctance related to the use of new technologies experienced by some of my study participants. I was able to connect with them in a way I might not have been able to if I had not been so involved in the incorporation process of technologies during my professional career, where I experienced myself the process of adaptation to these new tools. I believe my professional experience with work colleagues who were aged 55 years and over helped me to establish a friendly relationship with the participants.

Also, I was aware of some of the challenging issues that could arise in the interviews as older adults are a group in the population with specific physical and emotional needs due to the ageing process. I was able to identify opportunities to explore their experience in depth, which allowed me to effectively probe to obtain rich interview data that provided an accurate understanding of their information literacy experiences using mobile devices.

Finally, I lived with my husband and my son in Australia as an international student the first year of my Doctoral degree and I realised how my parents, who are 69 and 73 respectively, felt forced to learn how to use a tablet for communicating with us while we were living far away. Now they feel happy and experienced users of this mobile device, although they felt scared and distrustful of their own capabilities at the beginning. Now they see the use of their tablet as an excellent tool to communicate with their relatives and friends who are far away.

4.3 Mobile apps used by the research participants

In this section, I have included a definition of mobile apps and a table with the different apps used by each participant, as they experience information literacy through the use of these mobile applications.

Mobile apps, according to the definition by Beal (2018), are Internet applications that run on smartphones and other mobile devices such as tablets. Mobile applications usually connect users to Internet services and help them by making it easier to use the Internet on their mobile devices. A mobile app may be a mobile website

bookmarking utility (Pinterest, Evernote), a mobile-based instant messaging client (WhatsApp, Line), Gmail for mobile, and many other applications. Participants in this study make use of a wide range of mobile apps, as shown in Table 4.2.

Mainly, participants make use of mobile interpersonal communication apps such as Skype, Zoom, WhatsApp, Imo, email, SMS or FaceTime; web browsers apps such as Google or Safari; entertainment apps such as YouTube and principally gaming apps such as Solitaire app or Tetris app; educational apps such as Duolingo or Memrise app; social networks such as Facebook; travel apps such as Trivago app; Health apps such as Finger Blood Pressure app; everyday life apps such as banking apps, shopping apps such as Gumtree, GPS app and camera app. Thus, apps used by participants in this study can be classified as: entertainment, health, interpersonal communication, social networks, education, everyday life, travel and web browser apps. These mobile apps allow users to become better informed, analyse, create, find, share, manage and use information, and also to communicate with others.

APP	ANNE	LOUISE	BEN	ROSE	BETTY	PETER	EMMA	RAY	MARC	MICHAEL	SUE	CLAIRE
Communication apps (Skype, FaceTime, Zoom)	●	●				●		●	●		●	●
Instant messaging apps (WhatsApp, Imo, Viber, Line, Messenger, Email)	●	●	●	●	●	●	●	●	●	●	●	●
Phone calls	●	●	●	●	●	●	●	●	●	●	●	●
Web browsers (Google, Safari)	●	●	●	●	●	●	●	●		●	●	●
Entertainment apps (YouTube, Netflix, ABC, Radio, iTunes, Apple TV)		●	●		●				●		●	
Games apps (Tetris, Puzzle, Word, Scrabble, Card, Solitaire, Free Cell, Cryptic, Lotto)	●			●	●	●	●				●	●
Educational apps (Duolingo, Memrise, Oxford Dictionary)			●		●					●		
Social networks (Facebook, Pinterest)	●	●	●		●	●	●	●	●		●	●
Travel apps (Trivago, Webjet, TripAdvisor, Booking.com)				●	●						●	
Health apps (Finger Blood Pressure APP)			●						●			
Banking apps	●				●		●			●	●	●
Shopping apps (Gumtree)					●							
Location apps (GPS, Google maps)		●	●		●						●	●
Camera App	●	●	●		●	●	●	●	●	●	●	●
Calendar App			●									
Apple's voice-controlled personal assistant (Siri)					●							
Apps for identifying music (Shazam)					●							
Reading apps (Kindle, iBooks)	●						●					●
Photo Gallery app							●		●			
Photo editor app (Aviary)											●	

APP	ANNE	LOUISE	BEN	ROSE	BETTY	PETER	EMMA	RAY	MARC	MICHAEL	SUE	CLAIRE
Contacts apps (Whitepages)					●					●		●
Timer apps (Time zone, Clock)		●							●			●
Weather apps (BOM)			●		●							
News apps (BBC)		●	●									
Bible app			●	●						●		
Translation apps											●	
Cloud apps											●	
Currency app												●

Table 4.2 Mobile apps used by participants.

Participants in this study revealed they are able to download their own apps to their mobile devices. For instance, Anne stated that she downloads apps to manage tasks of her everyday life, such as managing her books: "I downloaded the Kindle app and now I've got all my books on the iPad" (Anne). Similarly, Rose said:

> *I know how to download games. And I know how to buy games and update games for my grandchildren. (Rose)*

Thus, information literacy may be seen as a process which enables older adults to discover, find and download mobile apps whose contents are of interest to them. Once they find these apps, they download them onto their mobile devices for the purpose of using them to enact their everyday lives. By downloading these apps, older adults are able to have greater access to information. Hence, apps turn into important sources of information for them.

4.4 Conclusion

This chapter has presented the profiles of the twelve participants and of me as the co-constructor of the data and meaning of this study. In addition, the chapter includes a table with the different mobile apps used by each participant. In the two following chapters I will report and discuss the research findings.

5 Findings

5.1 Introduction

In this chapter I present the findings of this study. Firstly, I describe a Grounded Theory of older Australians' information literacy experience using mobile devices, which is called Older Australians' Mobile Information Literacy: A Grounded Theory. This new theory reveals that older adults' information literacy experience using mobile devices is a complex phenomenon whose main aspects and characteristics have three components (older adults, information literacy and mobile devices) in six categories.

Next, I discuss the role of information literacy in older adults' engagement with mobile devices, pointing out the importance of the Internet in their mobile information literacy. Then, I explain what older adults experience as informing, what they do with that information and in which socio-cultural contexts their information practices occur. Afterwards, I describe analytically the diverse ways in which older adults experience information literacy using mobile devices through six categories. Finally, I discuss the relationships between the categories.

5.2 Older adults' information literacy experience using mobile devices: a Grounded Theory

In this section I introduce Older Australians' Mobile Information Literacy: A Grounded Theory, in keeping with Grounded Theory whose last aim is to create and develop a theory that answers the research question: How do older adults experience information literacy using mobile devices?

Older adults' information literacy experience using mobile devices is a complex phenomenon which takes place in a particular context: everyday life. Within the course of their everyday lives, older adults experience information literacy by interacting with information using mobile devices in a variety of ways. The findings

reveal a wide range of different types of individual practices using mobile devices, which comprise their information literacy experience.

Older adults' information literacy experience using mobile devices consists of six categories:

- *Ageing*
- *Learning to use and manage mobile devices*
- *Being entertained*
- *Enacting everyday life*
- *Learning*
- *Managing relationships*.

These categories are outlined in Table 5.1.

CATEGORY	SHORT DESCRIPTION
Category 1. Ageing	Older adults experience information literacy as a way of helping them to overcome their needs, concerns and health diseases during the ageing process through their engagement with information (analysing, becoming better informed, searching, finding, learning and using information).
Category 2. Learning to use and manage mobile devices	Information literacy is experienced as *Learning to use and manage mobile devices* by interacting with information effectively. Participants engage with information (analysing, finding, sharing and using information) through the learning and management of their mobile devices.
Category 3. Being entertained	Older adults experience information literacy when they discover and learn how to make use of mobile device applications, and when they access, understand and use these apps as a way of *Being entertained* through their engagement with information (analysing, finding, managing and using information).
Category 4. Enacting everyday life	Information literacy is experienced during the execution of tasks and problem resolution in their everyday lives. Participants engage with information (analysing, becoming better informed, creating, finding, managing, sharing and using information) through the process of developing their daily tasks.

Category 5. Learning	Older adults' information literacy experience emerges when they learn and acquire new knowledge through their information practices using mobile devices (analysing, finding, sharing and using information).
Category 6. Managing relationships	Older adults experience information literacy when they engage with information (creating, finding, filtering, sharing and exchanging information) to manage and strengthen their interpersonal relationships using mobile devices.

Table 5.1 Categories of older adults' information literacy experience using mobile devices.

These six categories show a rich picture of participants' information literacy experience using mobile devices, in different social contexts. It is based on a group of older adults' individual experiences using mobile devices. These experiences are influenced by diverse factors including belief, emotional, economic, psychological and technological aspects. In addition, the individual experiences of ageing and the personal interest related to Learning to use and manage mobile devices affect older adults' information literacy experience using mobile devices.

The findings of this study provide a substantive Grounded Theory; they represent a holistic view of participants' information literacy experience using mobile devices. Each category or aspect is not experienced by all participants. Participants experienced information literacy using mobile devices in diverse ways. The findings, which are presented as six main conceptual categories and their aspects, describe and explain the phenomenon of study, providing an interpretative component which is relevant in a substantive Grounded Theory, in describing the diverse views and experiences of participants (Charmaz 2014, p.240). The six categories describe what is happening and their aspects provide an explanation of when, why, how and where the phenomenon is occurring.

Three components are present across all categories: older adults (people who experience the phenomenon), mobile devices (tools in which take place the phenomenon) and information literacy (phenomenon that is experienced by older adults throughout their information practices using mobile devices). These

components cannot be separated since they always remain interconnected, occurring together across the categories.

5.3 Foundational concepts

In this section I expose and discuss the key concepts which constitute the foundation of the phenomenon of this research, with the purpose of describing and illustrating how older adults experience information literacy using their mobile devices through their individual and social information practices in different contexts.

Firstly, I discuss the role of information literacy in older adults' engagement with mobile devices according to the findings from this study, pointing out the role of the Internet in their mobile information literacy. Secondly, I present the findings related to what older adults experience as informing and what they do with that information. Finally, I describe the socio-cultural contexts where their information practices occur.

5.3.1 The central role of information literacy in older adults' engagement with mobile devices

Findings in this study revealed that information literacy is present in all the actions of older adults when they use mobile devices. Regardless of what apps they are interacting with or what actions they are undertaking, as they use their mobile devices, participants are engaging with information within their socio-cultural environment where they interact with information as a result of their activities with others in their everyday lives. These actions are carried out through their information practices, which are part of their information literacy experience. These practices refer to actions older adults carry out with information such as 'using information to learn' (Bruce 2008), seeking and evaluating information to complete an everyday task, or sharing information with others to keep them up-to-date, as part of their broader information literacy experience. The information literacy experience is comprised not just of an array of information practices but also of skills and competencies that enable older adults to know what there is within different contexts and to use it to carry out actions through their engagement and experience with

information. Older adults experience information literacy not just within social practices where information emerges as a product of their social relationships with others in different contexts; but also, within individual practices where information emerges as a product of their individual interactions with their mobile device as a tool to engage with information. Thus, mobile devices constitute a tool for engaging with information intentionally and unintentionally, which mediate and cause the older adults' information literacy experiences. The way information literacy is experienced and enacted through each action carried out by participants (each category is related to many actions) is described through the presentation of each of the categories.

Information literacy is experienced, in this case, using mobile devices. So, the level of technological competence and skill of each individual older adult impacts their way of using their mobile devices and thus impacts their information literacy experience. Data suggest that the more frequently that older adults make use of their mobile devices, the more they develop their technological competences and skills, which is in itself a part of their information literacy development. Betty said: "When I learn more I use it more properly. There are a lot of things to use on the phone, but I am learning" (Betty). Similarly, Emma stated: "the more I use my computer or my tablet, the more I'm learning what to do or not to do" (Emma).

5.3.1.1 The role of the Internet in older adults' mobile information literacy

Participants in this study revealed that they make use of the Internet to do most tasks through their mobile devices. When they need to connect with loved ones, access information, browse content, or play games, they do it through the use of mobile applications or by searching on web browsers making use of the Internet. The Internet has become part in their day-to-day lives. Hence, information literacy experience using mobile devices is enacted through apps, which is possible thanks to a connection to the Internet. Thus, the Internet plays a significant role in this study since the information literacy experiences using mobile devices occur while surfing the Internet.

Older adults in this study revealed the significant role that the Internet played in their lives. Sue talked about how she uses the Internet for satisfying all her information needs: "I find the Internet incredible, I get all my information of there." (Sue). Similarly, Claire described how it is possible to communicate with her relatives in an immediate way thanks to the Internet: "I can talk to my grandchildren and see things. I mean, I had kids overseas before there was Internet, and you know the letters would take weeks to arrive." (Claire)

Participants stated that they make use of their mobile devices for accessing the Internet not just to seek, find, share and download information, but also to communicate with others. They said that they access the Internet from anywhere at any time, and in an immediate and straightforward way thanks to the properties of their mobile devices. Participants consider the use of mobile devices for accessing the Internet very convenient, as Betty expressed in her interview: "I look at it on the Internet… immediately, straightway, it is very convenient." (Betty).

In short, the Internet has become an essential tool for older adults, which facilitates their everyday tasks. To be contactable and be in communication with others makes them feel connected with the world around them, as Sue stated: "it just makes me feel part of the social life, of the world around you, you know you stay in touch with the world around you". (Sue)

5.3.2 What do older adults experience as informing?

From the everyday information setting, information is understood as the information 'required for participation in daily life' (Lloyd et al. 2013). This definition applies to the current study where I explore what the participants experience as informing in the context of their everyday lives.

The results of this study reveal that older adults engage with diverse types of information not just within mobile devices, but also outside them. Older adults engage with different types of information accessible from their mobile devices: opinions, advice, data, personal or business announcements, their own knowledge and news. Also, older adults seek and receive information without using mobile

devices, by accessing their own knowledge, the advice given by others in conversations and also news on newspapers or television.

In mobile devices, information is contained within a wide variety of sources of information. Access to these sources of information occurs through the use of mobile applications, as the apps themselves are containers of information. Older adults can access different types of information from a single mobile app. For instance, through the use of the Facebook app they can find, receive and share opinions and news. Also, information contained in these mobile apps can be found in different formats including text, video, sound, images and numbers. In this section I define the different types of information, identifying the formats in which the information is received by participants.

5.3.2.1 Opinion

Opinion can be defined as information based on thoughts or beliefs about something or someone. Older adults seek different opinions related to a theme or topic of their interest. They also provide their own opinion with respect to a particular concern or issue. In addition, they receive opinions from others related to information shared with them. Participants revealed that they seek, give and receive opinions through accessing diverse websites or through the use of Facebook, where they express and receive opinions in the form of comments from friends and relatives. Mostly the opinion is given and received in text form, although it can be accompanied by pictures or simply by an icon, as Sue revealed in her interview: “It’s nice that other friends to make comments, they answer and give me the thumb up or put their comment under the picture” (Sue). Some participants shared that they like getting opinions from others, as Peter shared: “I like to get different opinions” (Peter).

5.3.2.2 Advice

Advice can be defined as information that suggests what people should do. Older adults ask for advice, seek and find information to guide their decision making. Advice can be found using mobile devices through Google and forums on the Internet. In this case, the advice is received in text form. In addition, it is received

from friends, family or work colleagues in conversations where people who take part in their social context become a source of information.

Participants revealed that they ask for advice and find information as advice purposefully. For instance, Marc seeks advice with the purpose of improving his health. He said:

> *I like Google to search information about healthy food, healthy things for body, about doctors, information about health, health information…I look different pages and I compare the information if they are not completely opposite, then I accept the advice. (Mark)*

Similarly, Sue and Betty ask for advice to solve problems about how to use their mobile devices:

> *I type the problem on the Internet… I go and follow forums where some people are discussing, and they say things and I've got some advice as answers from there. (Sue)*

> *I ask advice other people. My friends. Friends of work (Betty)*

Advice represents new and practical information which allows them to solve problems and get new knowledge about any topic of their interest.

5.3.2.3 Data

Data can be defined as information in the form of text, numbers or pictures that have been stored on their mobile devices. Older adults organise, transfer, save and store their personal and business data using their mobile devices. The participants revealed that they regard the information that constitutes their data as being really important, as this data has a significant value for them. Most participants shared that they store their data on more than one device in order to avoid losing it, as Emma stated: "I got a back-up in case of anything happens to my camera I save them to my tablet" (Emma).

5.3.2.4 Announcements

Announcements can be defined as informative publications for keeping relatives, friends or work colleagues up-to-date about what is happening in their personal lives or of any relevant information related to their professional work. Announcements are shared in text or visual form such as photos. For instance, Louise kept her son up-to-date while she was looking after her granddaughter, by sending him a photo. Similarly, Ray informs his religious community about when he has a seminar and what he is doing.

5.3.2.5 Own knowledge

Own knowledge can be defined as information that older adults have in their own mind. Older adults in this study revealed that they use and share their own knowledge to help each other to learn how to use their mobile devices or to solve a problem. Also, they stated that they learn from knowledge shared by others.

5.3.2.6 News

News can be defined as new information about events that have just happened. In this study, older adults find news on television, radio, newspaper websites, Facebook and printed newspapers. They prefer accessing news using mobile devices rather than via printed sources. Thus, they keep informed primarily by listening to the news on the radio, surfing the Internet, looking at Facebook and reading newspaper websites using their mobile devices. In addition, they showed their interest in being informed about events that are happening around the world. News can be found in various formats - text, video, sound and /or images.

5.3.3 What are the older adults' information practices?

From a socio-cultural perspective, information literacy is experienced through specific information practices within particular social contexts where these practices are carried out (Limberg, Sundin & Talja 2012). Information practices, related to everyday settings, are defined by Savolainen (2008, p.2) as 'a set of socially and culturally established ways to identify, seek, use and share the information available in various sources such as television, newspapers, and the Internet'. These definitions are in consonance with the results of this study. Older adults' information literacy

experience occurs through their engagement with information, which is enacted through practices such as the creation, seeking, analysis, use, and sharing of information, within diverse socio-cultural contexts (family, work, and community).

Data in this study also revealed that these information practices are influenced by the social setting where they take place. Thus, the main information practices that comprise older adults' information literacy experience, according to this study's findings, are:

- Creating information
- Finding information
- Being overwhelmed by information
- Analysing and using information
- Becoming better informed
- Perceiving the importance of being informed and the role of information in their daily lives
- Managing information
- Sharing information

All these information practices are interconnected and overlap. They may occur together. For instance: as an older adult learns to cook a recipe using mobile devices, they find information (the recipe), analyse and use it to cook the recipe, and may store it (manage it) to make use of it later and share it with others.

5.3.3.1 Creating information

Older adults create information through the use of their mobile devices in a number of ways. Participants revealed that they create new information intentionally when they share personal opinions, views and experiences, family pictures, business-related announcements, and personal announcements with relatives, friends and work colleagues. For instance, Anne and Claire revealed that they take photos and share them with family for keeping them up-to-date:

> *I use my tablet for my email and also for taking photographs and sending them through to my family that live away. (Anne).*

> *That's a photo of today. Just today I took it with my granddaughter, and I've sent that photo to her parents, because I was looking after her this morning. (Louise)*

Also, some participants share their opinion and experience with others using the social network Facebook. For instance, Peter said: "If I find an article or if I find a book or if I've done something, I write something, and I just send it to friends." (Peter)

Participants who have jobs or business create information as part of their work. They create new work and professional documents which they consider of interest and share them through text messages, as Ray revealed in his interview:

> *If I have to go to somewhere, to have a seminar with religious Ministers and then I have to report what I do, I use the camera on the tablet, even the smartphone. I take the picture, I write a message and I send it straightway. (Ray)*

They also create new information according to their own needs and interests, to use in the future as part of their job, as Claire revealed in her interview: "I use it for work when I go and take photos of a place I'm drawing a design for." (Claire).

Some participants showed that they create information when they take and edit their own photos through the use of mobile device apps. Sue shared that she uses a photo editor app:

> *I have got an app called Aviary…Yeah, if I open the app and I click on the photo, and If I want to do something into the photo, to make it smaller or… It does it for me. It's a photo editor. (Sue)*

Other participants like Peter create new information while they interact within groups or communities. Peter said in his interview: "I can create and share documents, so I can talk and see my students now, we can work on the document together." (Peter). In this case, participants create information within a group or community, where all people who take part in the group contribute by providing information. Also, Peter

creates new information with his students as a way of managing his relationships with them.

Older adults create information through individual practices, where they create information using their mobile devices for personal use. For instance, they create and edit their own photos or also, as Ben revealed, they create their own plans by making use of apps such as Pinterest, by discovering, selecting and storing information to use it immediately or in the future:

> *I used Pinterest last year, for instance, when I went to overseas last year. I said to Kerry, we're going to Romania, let's have a look to see if there are any photographs of Romania. So, I just typed in Romania and we looked that some of the countries we are going to see. So, it built some excitement. It helped us to see where we would like to go so we went to Transylvania we typed in Romania Transylvania where we want to go… Well, I mean, it is part of planning, it's for planning, for today, maybe planning even beyond today into the future, so it is very useful for planning. (Ben)*

Older adults also create information within informal and formal social practices where they provide information about their personal and professional lives, express their opinions and views, or make comments. This occurs through conversations and discussions on social networks such as Facebook or via communication apps such as Skype or FaceTime. In this case, the information emerges as a product of social relations with others.

5.3.3.2 Finding information

Participants revealed that finding information is one of their main motives for using mobile devices. Most participants noted that finding information using their mobile devices is more convenient, easier and quicker than using other sources of information such as printed newspapers, books or encyclopaedias. It should be noted, however, that some participants experienced difficulties finding information using their mobile devices due to the design of some websites or their lack of digital literacy skills to undertake effective searching.

Participants seek information purposefully, not only to satisfy their personal needs and interests, but also to satisfy the needs of people who take part into their social context, like relatives, friends or work colleagues, as Ben revealed in his interview:

> *Last night, I was visiting some people from Afghanistan., They invited me for dinner, so I went last night, I was talking to them about Australia, I was telling them about the migration of whales from the end of East coast of Australia, to the warmer water of Queensland. When I used the word whale nobody knew what whale was, so I just used Google, and I showed the picture of a whale and everybody knew what a whale is. So, I was able to show them what is a whale (sic). (Ben)*

Sometimes the information required is essential and in some situations it could be urgent, to do their everyday tasks in different contexts (family, work or community), such as finding a hotel, an address or a contact phone number. For instance, Sue said that she seeks information about offers and products when she is doing shopping on-line: "If I want to buy something I'm going to the Internet and I search online different shops to see if they have offers and I compare the prices." (Sue). Also, the information may be required to be entertained or pass the time, such as movies, music or games.

Other times the information need is associated with a question prompted by a conversation or random thoughts that came to their minds like Ray revealed:

> *For instance, I wanted to find out something about a Caribbean Island, I supposed that I knew it but, in spite of being there too many years, I wanted to know approximately the population in the Island and I just, I went to Mr. Google and it gave me the answer. (Ray)*

Thus, participants find information purposefully in a variety of ways, by:

- Asking questions in conversations
- Searching in forums on the Internet
- Searching for information primarily using Google ('Googling'), but also on YouTube, or using the Safari web browser

- Looking at websites
- Researching about particular topics, which means searching for information about a particular topic exhaustively
- Getting help from people using communication apps such as Skype, Right Now Media or FaceTime
- Making use of mobile devices apps related to particular topics such as health apps.

Sometimes this information is received by participants as ideas or advice, as Sue revealed:

> *I go and follow forums where some people are discussing, and they say things and I've got some advices as answers from there. (Sue).*

Other times, participants manifested their need to get advice, which is triggered by a specific issue, concern or doubt about anything, and the individual need of getting a response or opinion before making a personal decision. In this sense, some older adults in this study consider mobile devices helpful tools to get advice. Betty said:

> *Yes, I think so. To learn more about technology is very interesting, it is very helpful… Helpful means knowledge, getting advice. (Betty).*

Thus, information found represents new information. They find information or get advice from others, mainly from friends. In this regard, people constitute a crucial source of information, where the social context of the participants plays a significant role. Finding information and getting advice in this case would be experienced not just within individual practices, where participants seek information and get advice through their interactions with mobile devices where information emerges as a product of their individual and personal desire, need or interest; but also, within social practices through conversations with others, mainly friends. In this case, the information emerges as a product of social relations with others in different contexts.

Finally, it is important to mention that most participants in this study shared that they found it important to find information that guided their everyday lives, activities and decisions.

5.3.3.3 Being overwhelmed by information

Participants are overwhelmed by information due to information overload. When older adults get different information from diverse sources, sometimes they are not able to recognise what information is best, or what source of information they should choose in order to satisfy their information needs. This makes them frustrated. This feeling emerges when they search information purposefully, on Google mainly. Emma said:

> *Google shows me different links. Yes, yes. That frustrates me. Sometimes, when I type something, or even I use the microphone, I get about ten different things and apps and … you know, I find that it's very hard, very difficult. (Emma)*

Some participants resolve this issue by trying different links until they find the information that they need. After that, they stop looking. Being overwhelmed by information reveals one of the information challenges that older adults have: a lack of skills to identify which information is the most accurate and trustworthy.

Being overwhelmed by information is experienced within an individual practice where participants search for and find a large amount of information.

5.3.3.4 Analysing and using information

Participants experience information literacy when they analyse or use the information which they find through the use of their mobile devices. Comparing, evaluating and verifying information are the main three ways used by older adults to analyse information using mobile devices. Participants analyse information from different apps or websites by comparing and evaluating the different information found, as Marc revealed during his interview:

> *For example, I didn't know what the benefits of dates are, but after I look different sites, I found out the health benefits of dates, dates or other fruits. (Marc)*

Participants compare, evaluate and verify information intentionally as they enact their everyday lives and carry out their personal or work tasks. Some of these tasks would be to manage and improve age related conditions, to buy diverse items, to

book flights, to make calls, to control their finances, to make personal or professional decisions, and to verify the details of their personal invoices such as their electricity and gas invoices. For instance, Betty manifested that she analyses and uses their financial reports through banking apps:

> *I think that banking is the most important. Just I keep track when my money is spent. (Betty)*

Also, participants analyse information before making a personal or professional decision:

> *I use WhatsApp. I have a list of friends on WhatsApp, I check the time [throughout Timer app], if the time is ok, if they are not sleeping I call them. (Marc)*

Some participants analyse information sources by evaluating them according to the type of content and their personal interests and purposes: "I use two different sources, one of them is more academic and the other one is for pleasure." (Peter). Also, they analyse the content of books, articles, games or music by assessing the content according to their personal interests and preferences before downloading to their mobile devices.

Further, participants evaluate the reliability and quality of information according to their own criteria, based on their own experience, as Ray stated:

> *Ray: I choose the one that is the most appropriate to my needs.*
> *Gema: And how do you know which one is the most appropriate?*
> *Ray: The experience. Oh, well, I've been doing this for a while, a bit of time, you know, you develop some experience. Then you know which is the most appropriate to your needs, your main needs. (Ray)*

Evaluating the reliability and quality of information may involve taking account of the person who created that information (if he/she is known or not by them).

> *When you are looking for, you need to know if the site is a good site, if it is a respectful site, and you might know the people who work there, so you're more likely to believe what they are saying, it is more reliable information. (Peter)*

Finally, although most participants analyse and use the information that they get, some of them stated that they experience some difficulty discerning the reliability and quality of information, as Marc said: "I can't know if the source is reliable" (Marc). This fact reveals a lack of information literacy skills.

Analysing information is experienced within an individual practice where the analysis of information is purposeful. Older adults analyse information by themselves according to their personal interests, needs and own criteria. Thus, the information, once it is analysed, appears subjectively. It emerges as a product of an individual interaction with different information sources, mainly websites and mobile device applications, within different social contexts (work, family or community) where their everyday lives are enacted. It is the result of a particular way of interpreting that information. Through their individual interaction, the information is analysed with the purpose of constructing personal knowledge in order to develop their own everyday life tasks.

Hence, older adults use information found through mobile devices in a variety of ways, including in combination with information from other – non mobile – sources, such as their existing knowledge and experience. They use information for specific purposes: to solve problems; to learn or manage the use of their mobile devices; to learn about any topic of interest for them such as learning how to cook a recipe; learning a language or learning about their health condition; to help others; to make personal or professional decisions; to keep up to date with what is happening with their family and friends; to fulfil professional tasks or simply know what is happening around the world.

Thus, analysing and using information can be:

- Proactive: they analyse and use information driven by a personal or work need to analyse for the execution of personal and professional tasks.
- Routine: older adults analyse and use information regularly as part of their routine tasks. For instance, when they check and analyse their personal finances and invoices.

- Purposeful: participants revealed that they analyse and use information with the intention to enact or carry out personal or professional tasks such as managing the use of their mobile devices, learning about something in particular or obtaining economic benefits by comparing prices before buying something.

5.3.3.5 Becoming better informed

Older adults experience becoming better informed as a result of being able to access information independently, at any time, anywhere and immediately using their mobile devices. Participants have ready access to information and this makes them perceive that they are better informed, and they are able to keep up to date with what is happening around the world, in their family and friends' lives, and with professional tasks, thanks to the mobile devices' properties. This makes them feel better about themselves, increasing their confidence, feeling of security and self-esteem. They perceive an improvement in their everyday lives.

One of the participants noted they are able to access to diverse sources of information with different points of view from their mobile devices. This provides the possibility of getting different opinions and a cross-section about a topic or event, which allows them to become better informed.

> *So when I am reading it's informing me of each event, you know, I like getting different opinions, you know, especially about things like immigration, you get some people who are not in favour, and someone argues that he is in favour, and I like to get the cross-section. I think it is a very good way to become more informed. (Peter)*

Participants become better informed purposefully (with the intention of gaining information and being informed about something in particular) or incidentally (without intention, when becoming better informed occurs simply while they are on Facebook, participating in forums or through informal conversations via communication apps, where information is received incidentally).

Participants become better informed in a variety of ways, by:

- Reading newspapers online
- Getting different opinions and views from diverse sources
- Listening to the radio
- Searching for information, mainly on Google
- Finding information
- Talking with others via communication apps
- Participating in forums on the Internet
- Surfing on social networks, mainly Facebook.

5.3.3.6 Perceiving the importance of being informed and the role of information in their daily lives

Participants revealed the significant role that information plays in their lives. They experience the importance of being informed when they need to enact any of their everyday tasks or reach personal or professional goals. In these instances, information is conceived of as an essential instrument in managing these tasks. They focus on their influence over their own lives. Being informed is about becoming able to apply information to the development of their daily tasks using mobile devices, bringing about positive changes in their lives. They are aware that information is a powerful and useful instrument which changes positively their own lives in different social contexts (work, family or community). Ray said in his interview: "Who gets the information has the power." (Ray)

Finally, most participants also revealed the significant role that information plays into their lives through their fear of losing information and their negative feelings experienced when this happens: "I lost data before and it is terrible" (Peter).

5.3.3.7 Managing information

Participants manage their information in a variety of ways:

- Organising: some participants organise their own contents using mobile devices according to their needs and likes. Sue said: "I've got different documents, different folders for travel, for health, for tax, for this, for that" (Sue)

- Transferring: older adults in this study transfer their contents from one device to another one. For instance, Emma said: "I can transfer the photographs from my tablet to my computer where I keep them" (Emma)
- Saving and storing: Participants store information for using it in the future through its retrieval. Emma said:
  I just open the Kindle site and if there is any book that I'm interested in or a good book, I download it to my tablet… I read it on my tablet when I am on holidays simply because that's a lot smaller and I don't have to carry big books. (Emma)

Also, some participants like Sue and Emma store information in different devices to avoid the loss of important information or data.

> *Any information that I need to keep I would store it in those folders and that would be not only on my iPad, well they would be on my computer. (Sue)*

> *I got a backup, in case of anything happens to my camera I save them into my tablet. (Emma)*

Participants manage information that they get in order to use it for an imminent task or for future use.

Managing information is experienced as part of their everyday lives, where information is an essential instrument in order to enact their everyday tasks, which form part of their daily lives. In this case, older adults organise, update, transfer, save and store information purposefully.

5.3.3.8 Sharing information

Older adults in this study share information (photos, music, news, their own knowledge, views, opinions, and personal and business announcements) and information resources (for example, links) using mobile devices and apps such as FaceTime, Skype, email, WhatsApp, Facebook and Messenger, purposefully, in order to:

- Keep friends and relatives up to date about their own lives, where sharing is conceived as a way of staying in touch, particularly with those that live far away. For some participants, sharing information helps them feel close to their loved ones.
- Help each other. Some participants share their knowledge with others in order to teach them and help them to use their mobile devices.
- Work. Some participants share information as part of their work. In addition, sharing information with others whose interests are the same or similar to theirs allows them to keep up-to-date and learn from knowledge shared from others:

  I like sites which people are working in the same area, and we share this, and you learn from other people or what they are doing in different countries, different places. So, I am also interested in ageing, older people, and the problem of ageing. So, I've got sites where I read about it and share with other people. Yes, I learn. (Peter)

Participants share information one to one or in groups, in formal communities (e.g., academic and ecclesiastical communities) and also in informal communities (e.g., groups of family or friends). Thus, sharing information is experienced within social practices where information emerges as a product of social relations with others within different contexts. For participants, sharing information fosters a sense of community and connectedness with people who have the same or similar interests.

Related to sharing, many participants revealed concerns with privacy. They are reluctant to share not just their own mobile devices with others, but also personal data or any other type of information using particular apps (particularly Facebook, which is considered a public space by participants), or apps where it is mandatory to introduce personal data in order to make use of them, such as banking apps. Hence, participants are selective about: the people who they share information with; the space or app where they share information; and the type of information that they share.

In this section I have defined the types of information practices which comprise older adults' information literacy experience using mobile devices. Also, I have explored and described how each of these information practices emerges and is enacted by older adults.

5.3.3.9 Information practices as socio-cultural practices

All these information practices, which comprise the older adults' information literacy experience using their mobile devices, happen within different socio-cultural contexts: workplace, family, community, and as individuals in their everyday lives. In this sense, information literacy is understood as a socio-cultural practice, where practice is related to the practice of information literacy embedded within information practices to carry out a task (Tuominen, Savolainen & Talja 2005).

Therefore, information literacy is embedded in each mobile-related activity undertaken in of these contexts by older adults.

Older adults in this study showed that they experience information literacy using mobile devices within individual and social practices. On the one hand, participants analyse, create, find, manage and use information as individuals through their access to and interactions with mobile devices, where the motivation for engaging with information emerges as a product of their individual and personal interests, likes and needs. For instance, they create their own list of music or edit photos.

On the other hand, they also analyse, create, find, manage, share and use information obtained from informal social practices such as conversations and discussions with relatives, friends or work colleagues. Also, they engage with information through practices within informal social practices using social networks such as Facebook; using communicating apps such as Skype or FaceTime, or sending and receiving text messages through the use of SMS, email or messenger, where they inform, express their opinion or make comments. In this case, the information emerges as a product of informal social relations with others in family, friendship or work contexts.

Participants also interact with information within formal social practices, such as collaborating on a professional task with work colleagues, through communication apps such as FaceTime or Zoom. In this case, information emerges as a product of a social relationship, and through discussions and conversations. In addition, they engage with information within formal social practices by seeking and asking for professional advice through access to specialised websites, articles, videos and apps. In this case, the information emerges as a product of formal social relations with experts and professionals, who are specialists in an area of interest.

5.4 Categories of information literacy experience of older adults using mobile devices

In this section I describe analytically the diverse ways in which older adults experience information literacy using mobile devices, through six categories of older adults' information literacy experience using mobile devices. These categories are outlined in Table 5.1.

5.4.1 Category 1. Ageing

> *When my children went to school they often went with pen, pencil case and books. My grandchildren are going to school with computers. So, yes, it's just the way of the world, if you don't keep up with my age, if you don't keep up, you'll be left behind. (Emma)*

Older adults are conscious of the aging process. They experience and are concerned about physical and cognitive changes produced by the ageing process. These age-related issues and their impact on how the participants make use of their mobile devices, particularly related to their experiences with information, emerged over most interviews.

Data suggests that these age-related changes make it difficult for older adults to keep up with the times and keep in step with younger generations, in terms of technology adoption. Older adults in this study understand mobile devices as helpful tools for keeping up with the younger generations and keeping active in today's society. They

consider it crucial to make use of mobile devices if they want to 'keep up with the times' and not to be left behind. Making use of mobile devices is a connection point between younger and older generations. When older adults understand how mobile devices work and are able to use and talk about these devices with younger generations, particularly with younger relatives such as their children and grandchildren, they feel more connected with them. Older adults want to make use of devices in the same ways that younger generations use them, despite perceiving generational differences that impact on their understanding, behaviour and way of making use of new technologies.

Ageing is a challenging and complex change process that is experienced differently by each person. These changes experienced over the ageing process impact on participants' experiences of information literacy through the use of mobile devices. Hence, this category is present and exerts an influence in all categories.

5.4.1.1 Managing and improving age related conditions, including health conditions

Ageing and the ageing process are defined as 'the progressive accumulation of changes with time that are associated with or responsible for the ever-increasing susceptibility to disease and death which accompanies advancing age. These time-related changes are attributed to the aging process' (Harman 1981). Changes associated with the aging process arose in most interviews. Older adults are aware of these age-related changes and also, they showed clearly their concern and fear of suffering physical conditions and cognitive health issues related to aging.

The interviews revealed that mobile devices play a significant role in the aging process, by helping older adults to improve and manage these age-related health diseases. For instance, Mark talked about how he seeks information related to managing and improving his health condition on YouTube or Google, using his smartphone.

> *I have problems with my fingers and I went to YouTube or Google and I found some medicines, for example, Turmeric. Turmeric is good for*

> *arthritis or tahini with sesame or honey. I mix them, and they are good for arthritis. (Marc)*

Thus, age-related health changes impact on their information needs. Older adults find information about these age-related health issues in order to read up on them and know the symptoms, as well as maintain, improve and manage their health condition. Some participants revealed that they sometimes analyse the information found, and use this information effectively by experiencing, in some cases, an improvement of their health condition and so an improvement in their quality of life.

Participants, in this study, are informed by information from a range of sources: they access information prepared by health professionals through hospital websites, read articles through websites, watch videos via YouTube or Google, and make use of health apps such as Finger Blood Pressure app, which provides information about heart rate and blood pressure, and Health app, which shows health and fitness information. They use information to maintain and improve their current health condition, as Ben revealed in his interview:

> *I use this one every day. It is called the Health app. So, I can find out how far I walk every day. So, I can know how far I walk every day and I carry it. I have not had it surgically planted into my body yet, but I carry it with me all the time to see how far I go every day. It's just very helpful. (Ben)*

Similarly, Sue stated that mobile devices improve her quality of life through the use of apps:

> *I think it improves your quality of life because these days you can use medical apps… Through the use of the iPad you can actually improve your thinking. (Sue)*

In this case, information literacy is experienced by older adults as trying to maintain and improve their current health condition.

5.4.1.2 Advantages and disadvantages of mobile as opposed to other devices for ageing users

This study revealed that age-related health issues impact on mobile device use. In some cases, mobile devices are helpful tools for some participants in managing age related health issues, and in other cases health issues or device features and properties present physical barriers to use.

Mobile devices help older adults to engage effectively with information despite age-related health issues because of their features and properties. For instance, Marc pointed out that it is easier for him to use a mobile phone than a laptop because of its size:

> *It's easier to carry the mobile phone with me because it's small, the laptop is big and also, I have arthritis in my hands. (Marc)*

Similarly, Peter prefers reading on his tablet to reading on paper because he can adapt the size of the print to help manage his sight problems:

> *I am getting old and my sight isn't good, so I can change the size of the print. (Peter)*

However, some participants also revealed that there are physical barriers to their use of mobile devices due to their health conditions. These physical barriers are related to sight issues for most participants, except for Marc (see quote above), who talked about his arthritis and how it makes it difficult for him to access information through his smartphone. Participants who have sight issues experience difficulties in accessing information through the use of their mobile devices, due to the small size of the mobile device's screen. For instance, Michael stated that he prefers using a computer with multiple monitors over his smartphone due to his sight issue:

> *Some people have tunnel vision, right? I can see that much. So, on my computer at home I've got two big screens. I can watch several things at once and keep track of them. (Michael)*

Thus, the age-related health changes experienced by participants over their process of ageing, impact on mobile device use.

5.4.1.3 Staying mentally active including avoiding dementia

One of the age-related changes or concerns that older adults in this study talked about was the need to stay active as they age. 'Active ageing' can be understood as 'maintain mental and physical capacities that facilitated productive and social engagement in society' (Rowe & Kahn 1997). For participants in this study, 'active ageing' concerns particularly related to staying mentally active.

Data also suggests older adults are conscious that health issues might arise as a result of natural ageing and that being mentally active is important for their overall health.

> *When you get older, you need to be very knowledgeable, to keep your brain working. (Betty)*

Participants clearly articulated their concerns and fears related to their cognitive health. Marc said: "I hope that I don't get dementia." (Marc); and Emma also expressed her concern openly:

> *Well, I think that I'm getting quite older, I know. I forget things. And some things that I've read about elderly people, the more you use your mind, the less you are going to age with mental problems. (Emma)*

Likewise, Emma states that she considers the use of her smartphone and tablet good for keeping her mind active: "It keeps my mind active. It's good for the mind." (Emma)

Thus, older adults in this study engage in practices using their mobile devices that they believe will have positive health benefits and help them to avoid conditions like dementia.

5.4.1.3.1 Keeping the brain active through their experiences with information

Findings in this study also revealed that older adults train and keep their mind active through their experiences with information using mobile devices and apps (mostly by playing games).

Searching information

Some participants train their brain when they search information, as Marc stated: "When I search for information, that activates my memory and then it helps me to train my brain." (Marc)

Playing games

Most participants claimed that they train their brain by playing games, like Emma and Sue:

> *I've gone to the Spider Solitaire It keeps my mind active. Good for my mind. (Emma)*

> *Sue: I am maybe more through the use of the iPad because there you can get on the Internet, you can get puzzles, you can get brain games… You can actually improve your thinking and improve your skills. (Sue)*

Learning more about how to use their mobile devices

Other participants stated that they train their brain when they are learning how to use their mobile devices. This was revealed by Claire:

> *Gema: Ok. Would you like to learn more about how to use your tablet and smartphone?*
> *Claire: Probably. Yes.*
> *Gema: Right. Do you consider that it's important to learn more, or not?*
> *Claire: Well, I know it has more potential than what I use it for, other applications that I could use. And some of it's part of just keeping your mind active and trying to not be too far behind the children. (Claire)*

Learning

Participants revealed that learning is another way of keeping their brain active. This will be covered as a separate category, into the *Category 5. Learning*.

In this case, information literacy would be seen as a process which enables older adults to train their brain using their mobile devices to engage with information as a way of staying mentally active. Information literacy is experienced within individual

practices where participants train and keep their brain active by themselves, through their interaction with mobile devices and apps where information emerges as a product of their individual and personal decision to stay mentally active.

The stimulus for engaging with information is triggered by individual awareness of engaging in practices which help to train and keep their brain active and avoid suffering mental diseases.

On this point, mobile devices constitute helpful tools to train and keep active older adults' brains.

5.4.1.4 Actively participating in society

In addition to being mentally active, participants expressed a desire to remain socially and professionally active, and their use of mobile devices play a role in that. Peter talked about older adults' need to keep socially active: "When you're old you need to talk to people, you need to keep in touch with your friends" (Peter). Mobile devices help older adults to be and feel active through their information literacy experience, where they engage with information as they interact socially and participate in society. They are able to enact and keep social relationships, as Marc revealed, through his participation on the radio using his smartphone:

> *I feel very good because I get a lot of friends and I meet a lot of friends but also many friends that I have never met before from other countries, other cities. I have many friends. Sometimes I speak on the radio, Persian radio. (Marc)*

Also, some participants, like Peter, go on developing their jobs although he is retired:

> *I was working for 30 years as an academic, and I've been retired for 10 years but I still work with students. I have five doctoral students myself. And so, I communicate with them through the tablet talking to one another about the progress. (Peter)*

Further, participants showed that mobile devices are good tools for helping them keep active, as Marc said in his interview: "It's good for me because it keeps me busy." (Marc)

Thus, in this case, participants engaged with information as a way of keeping active in today's society.

5.4.1.5 Keeping up with younger generations

Data suggest that changes related to the ageing process make it difficult for older adults to keep up with younger generations and with the present times. Despite these difficulties, participants stated that it is important to have common points with younger generations in order to be able to establish and keep relationships with them and stay connected to the present. Emma claimed that using her smartphone for keeping in touch with her grandchildren not only helps her to stay in touch, but also helps her to feel like she is connected to the current generation:

> *I have my grandchildren and I love keeping in touch with them with my mobile phone. And it is a good way to keep in contact with them. And I feel it is helping me to stay in the present generation. (Emma)*

Thus, the use of mobile devices is considered by older adults as an important way to keep up with younger generations. They feel that the use of mobile devices is an important common point between generations and a way of not getting left behind. Participants claimed that when they know how to use their mobile devices to keep in contact with younger generations, when they understand and can talk about new technologies, they in turn can understand what younger people are talking about and feel more connected to them.

> *And it makes me more comfortable in this generation. I feel that I've got more in common with younger people by using this technology. (Emma)*

> *I wouldn't like that my grandchildren to say to me don't you even know how to use the computer. I'd feel very stupid. And yeah, so I think to keep up with the times. (Sue)*

Thus, older adults keep up with younger generations through the understanding and use of their mobile devices.

Older adults consider the use and management of their mobile devices as a significant connection point between generations, and a helpful tool for moving with the times and overcoming their fear of getting left behind. Thus, the main motivation for engaging with information is to learn how to use mobile devices for keeping up with younger generations and to feel included into the today's society. Therefore, younger generations, mainly younger relatives, help older adults to connect with them by teaching them how to use their mobile devices. For instance, Anne said:

> *It's all new but my grandchildren have taught me what to do… my grandchild, he's five and he knows, probably you've got to grow with your grandchildren, I feel that I do not get left behind. So that's why it's important to me. I have something in common with them. (Anne)*

5.4.1.6 Generational differences

The term "generation" is understood as 'a cohort of persons passing through time who come to share a common habitus and lifestyle' (Turner 1998). Broadly, the participants in this study can be considered to be a part of the same generation. The 'habitus', defined by Lizardo (2004) as the way group culture and personal history shape the body and the mind, and as result, shape the present social actions of each individual, and 'lifestyle' common to a generation is likely to have a significant impact on the way individuals understand and make use of mobile devices. Certainly, participants in this study perceived that there were differences in the ways in which they experienced mobile devices compared with younger generations.

Data suggests that these differences might begin with the way participants understand mobile devices and their functions. Claire said: "I'm still of the generation who thinks a phone is a phone" (Claire), suggesting that her understanding of the fundamental role and function of a mobile device is grounded in their use to make and receive calls. Similarly, Michael stated: "Mostly just to communicate with people. Very little Internet or searching, that kind of thing" (Michael). Also, he pointed out: "It's a phone so it's not a music box" (Michael),

understanding that listening to music is not the main function of his smartphone. Findings in this study revealed that older adults conceive of mobile devices as communication tools mainly.

Related to this, some participants expressed a preference for communicating via talking on the phone, which stems from their understanding of the role and function of a phone:

> *Gema: Why do you think that you prefer speaking?*
> *Emma: I think it is a generation thing because we always spoke to people, if I couldn't see that person, I would ring that person and talk to them. (Emma)*

Older adults in this study recognised that there are generational differences with respect to the way they engage with information using their mobile devices. They have had less access and exposure to new technologies since they grew up in a different generational context. This creates a generation-based digital divide related to skills and knowledge. A majority of participants acknowledged that younger generations are more knowledgeable and are much more familiar with the use of their mobile devices than they are. Betty said: "they are more knowledgeable about technology" (Betty) while Claire's statement that "I think that a four-year-old child can do more than I can do" (Claire) clearly expresses the gap between her knowledge and skill, and that of younger generations.

In addition to having more developed skills and knowledge, younger generations may also have more cause to use mobile devices as part of their everyday lives. Emma claimed that she makes less use of her smartphone and tablet than her daughter does:

> *My daughter and my daughter in law in their work they're using computers, smartphones and tablets all the time, when I use mine occasionally. (Emma)*

Younger generations have grown up with new technologies and they naturally make use of them all the time, while older adults feel pushed to make use of them as part of their everyday lives. Emma expressed:

> *if I don't use my phone, or I don't use my computer I would be lost because this is the way, it is used more and more and more... it's just the way if you don't keep up, with my age, you'll be left behind. (Emma)*

Some participants feel pushed to make use of these devices because they do not want to feel lost and left behind. Other participants, like Michael, feel pushed to use them because they consider mobile devices a way of life: "they become essential, so that's the most important because they are now a way of life." (Michael)

Another generational difference relates to alternative means of engaging with information. Most participants talked clearly about how they are used to engaging with information through the use of different means than younger generations. In the past, older adults made use of different tools (e.g., paper, pencils and books) for communicating, learning, developing their work and being informed, while younger generations are used to making use of new technologies for engaging with information. As Peter stated:

> *Young people are growing up with these things and it is part of their life, you know. I started with pencil and paper, with different tools. (Peter)*

Claire mentioned: "I go to the library and get books. I like the feeling of a book in my hand. Yes. I suppose it's just something I've always done." (Claire). Also, Sue said: "We read the newspapers." (Sue).

The perception that younger generations are more adept with technology leads older adults to ask younger generations for help when they experience difficulty with the use of mobile devices. For instance, Betty said: "I usually ask to my friends at work. The young people know how it works." (Betty). Similarly, Sue also asks for help from her young relatives when she has difficulty: "if I am not confident about something when I do it, I ask to my daughter or my son in law." (Sue)

They trust younger generations to help them to make use of mobile devices, since older adults consider younger generations to be much more familiar with the use of new technologies. In this case, younger people constitute an important source of information used by older adults.

Older adults in this study revealed that they understand their own experience of mobile devices in juxtaposition to the way younger generations experience them. This understanding of their use of mobile devices as different from that of younger generations underpins their mobile information literacy. In this way, their information literacy experience is built on a perceived deficiency: they see their use as different, less sophisticated, and less skilled, than that of younger generations. However, they also recognise that they can learn from younger generations and thereby improve their information literacy experiences.

5.4.1.7 Summary

In *'Ageing'* older adults revealed how the changes related to the ageing process impact on their lives and the significant role that mobile devices play in this process, where the use of these devices can help them to maintain, improve and manage their age-related health condition; to keep active not just mentally but also, socially and professionally; and finally, to keep up with younger generations, through their engagement with information.

In this category, older adults experience information literacy through the following practices of information: analysing, becoming better informed, searching, finding, learning and using information.

5.4.2 Category 2. *Learning to use and manage mobile devices*

> *I needed to start to learn how to do something… And I know older people need to learn how to use these things. (Rose)*

Although all participants acknowledge the importance of making use of mobile devices in today's society, their centrality in their lives, and their interest in learning how to use them, they also have a lack of digital skills and experience, and at the beginning of their learning process and adoption, they experience negative emotional feelings. Most participants fear making mistakes and the unknown, many of them feel alone, and may feel 'forced' to learn and use mobile devices. The affective dimension of the learning experience impacts considerably on participants' adoption

and use of mobile devices, and in turn, on their information literacy experience. Hence, *Learning to use and manage mobile devices* is the foundation category for all other categories in this study. This category enables the experiences of all other categories to occur. If older adults learn to use and manage their mobile devices they are going to be able to use their mobile devices to be entertained, enact their everyday lives, learn, manage their relationships, and help them overcome their needs, concerns and diseases related to the ageing process.

Information and services are increasingly available via Internet-based technologies and mobile devices can be used to access them. In *Category 4. Enacting everyday life*, I discuss the ways in which having access to information and services via mobile devices improves participants' lives. Given the positive impact of these devices on participants' lives, it is important to understand potential barriers to adoption, including the negative feelings older adults may experience while they are learning and using mobile devices. It is also crucial to create and design services to help them acquire the digital skills required to make use of these devices.

In this category, information literacy is experienced through *Learning to use and manage mobile devices*.

5.4.2.1 Being introduced to mobile devices

Participants started using mobile devices for a variety of reasons. These include: being exposed by family; being able to interact with others, by seeing them and talking to them at the same time from anywhere; being possible to be contactable and in constant communication at any time and anywhere; and keeping up with younger generations, mainly with their grandchildren.

Emma and Ray did not start using their mobile devices of their own volition. Rather, their relatives introduced mobile devices into their lives. In such a case, engagement with mobile devices comes from external sources – people who are part of their social context, mainly relatives. Emma said: "My daughter bought it for me and she said: you are going to learn." (Emma); Similarly, Ray answered in his interview:

Gema: Could you tell me about how did you learn to use these devices?

> *Ray: Oh, firstly I was introduced to it by my daughter, if it wasn't for my daughter a long time ago, now…(Ray)*

This could reveal a lack of motivation to make use of these devices and apps, as Anne and Rose showed: "At the beginning, I thought, I don't want one, I won't know what to do, I'll look silly" (Anne); "I can say I don't like using smartphones or tablet much" (Rose). Peter started using iPad for interacting with his students:

> *The reason I got the iPad is to do that I can create and share documents. So, I can talk and see my students now, we can work on the document together. (Peter)*

Emma also stated that another reason to make use of mobile devices is to be in constant communication and be contactable:

> *I have a very elderly dad and I can be in the grocery store and if something happens to him they can contact me and it doesn't matter where I am, I am contactable. (Emma)*

Some participants like Anne considered it important to start using mobile devices to keep up with younger generations:

> *Gema: Why do you consider that it's important that he start using the tablet?*
> *Anne: I do, otherwise you get left behind and my grandchild that's probably, oh, he's five, my youngest grandchild is five and he knows. (Anne)*

In all these cases, the engagement with information is derived from external factors where people who are part of their social context are a crucial source of information. This engagement with information occurs as a passive process where information is received or encountered instead of pursued.

Information literacy would be seen, in this case, as a process which enables older adults to discover and find information about mobile devices through their engagement with information. Information literacy is experienced within informal social practices: conversations with friends, relatives or work colleagues where

information emerges as a product of social relations with others within different contexts; and also, it is experienced within individual practices where participants discover mobile devices by themselves through their interaction with them, where information emerges as a product of their individual and personal decision to discover these devices.

5.4.2.2 Discovering apps

Participants discover and begin using apps: when exploring them by themselves, as Emma said: "I have an apps' store and I just click on it and I go throughout that and if there is something there that I want, I just download it to my phone." (Emma); playing with them, as Ray stated: "Playing with them, playing with the items, when you handle them" (Ray); and primarily based on the advice of friends, family and colleagues. When asked how they discovered apps, Marc, Michael and Ben said: "My friends showed me them." (Marc); "Through another friend. They were learning French, and I am not learning French at the moment, but that covers quite a few languages." (Michael); "One of my younger colleagues told me about that." (Ben).

The overall information practice in this case is active in nature. Once the participants acquire the information, they use this information to start using these apps. Once they receive a recommendation, participants evaluate the apps and start using them if they consider them good and useful according to their interests and needs. Michael stated that he evaluates the information provided by friends and uses this information to try out how an app works before deciding to use it:

> *Oh, just listening to what my friends are using and just evaluating how good it is. If I try an app and I don't like it, I get rid of it. (Michael)*

Therefore, although they discover mobile apps through information received from others, the final decision about whether to adopt these apps fundamentally depends on their personal interests and needs.

5.4.2.3 Learning to use mobile devices

5.4.2.3.1 Independent learning and exploration

All participants, except one, manifested, in this study, that they learn to use their mobile devices by themselves in a range of ways. This includes kinaesthetic approaches. It means that they learn through their own experience, like trial and error (Sue), or by experimenting or playing (Ray).

Participants also seek information through a range of sources such as Google, help functions on their devices, or online app/device support sites. For instance, Anne makes use of Google as an information source to learn how to use her tablet to do a specific task: "if I didn't know anything I would Google it. Go to Google and find out how to do it." (Anne). Anne also uses information presented in software updates and associated tips:

> *The iPad has their regular updates and tips I find that very interesting. I've told my husband to read up on the tips because, you know, something could come up that you've been wondering about and it's there and you've just got to read through it and learn to do it. (Anne)*

Once they locate the information they need, participants analyse the information and finally use this information to learn or solve their doubts about how to use their mobile or apps.

Older adults see information as an instrument to independently learn how to use their mobile devices and apps to do a specific task. Information literacy is experienced as a process of finding, analysing and applying information in order to learn how to use devices and apps. This is an active process where information is pursued at the time of need, to allow the user to learn how to do something in particular. Participants like Anne also consume information proactively to learn about functionality, without necessarily having a need to learn something in particular.

Information literacy is experienced, in this case, within individual practices. Participants independently and individually seek, analyse and use the information acquired to learn how to use their mobile devices and apps, where information is located and used as a product of their individual and personal interest in learning.

5.4.2.3.2 Getting help from others

> *When I have a problem with WhatsApp I call my son. If he is not available, I call my friends and they can help me... For example, saving photos, I didn't know how to use it, I asked my son and he came and showed me how to save photos for sending them by email, or from Facebook how to save them into my smartphone. (Marc)*

Although findings show that older adults learn to use their mobile devices independently like Ben, Ray or Marc: "I learn by myself" (Ben), "I am teaching myself. Yes, I play with them." (Ray), "I've learnt by myself" (Marc), data also revealed that at times, they require help and support from others to learn to use their mobile devices. Most participants prefer to ask for and receive support from relatives and friends, and indeed this is the group that tends to offer them support. Only one participant indicated he asks for help and receives support by taking adult lessons or by using online staff from Apple. Thus, relatives and friends, who are part of their social context, play a significant role and are a crucial source of information and support for older adults to help them to learn how to use mobile devices.

Claire asks her son for support: "When you get stuck or you have any difficulty, what do you do? … I go to my son" (Claire), while Rose asks her husband. Sometimes, they might need help with the same thing more than once: "Ah, my husband shows me, again, how to do that, how to get on, he always shows me." (Rose)

Similarly, Betty and Marc, revealed that they ask their friends for help: "I usually ask my friends." (Betty); "I call my friends and they can help me." (Marc)

In this case, information literacy is a process in which older adults ask for help and receive support from others as a way of learning and solving their difficulties related to the use of mobile devices. In these instances, they seek information purposefully, in order to learn how to use their mobile devices or solve a doubt or difficulty related to their use through their information practices. Here, information literacy is experienced within informal social practices, mainly conversations with relatives and

friends, where information emerges as a product of these social relations within different contexts, especially family and community contexts.

5.4.2.3.3 Experiencing a lack of digital literacy skills

All participants revealed that they experience difficulties when they make use of their mobile devices. This study has revealed that these difficulties are due to a lack of digital literacy skills, which could impact negatively on the adoption and use of mobile devices by older adults. Most stated that they have difficulty using basic functions of their mobile devices. The following quotations show some difficulties executing simple functions of mobile devices, such as forwarding a message, locating apps, copying and pasting text or sending photos:

> *I could never work out how to forward a message. I think I might know now, but I'm not certain how I do it. (Louise)*

> *I don't know where Google is on my smartphone. (Marc)*

> *I don't know how to copy and paste on this. (Louise)*

> *I have got friends and colleagues from overseas and they do trips, and every day I get photos from them, and they show me where they are, and they send them straight to me. I would like to do this with them. So, I would like to learn how to do that, but I can't yet. (Peter)*

Older adults showed interest in learning how to use their mobile devices to do more things with them, despite the difficulties that they experience due to their lack of digital literacy skills. Betty stated:

> *I would like to learn more, when I learn more I use it more properly. There are a lot of things to use on the phone, but I am learning. (Betty)*

Information literacy would be seen, in this case, as striving for learning and using mobile devices. The primary focus is to overcome all difficulties related to the use of mobile devices and to learn.

Information literacy is seen as a process in which the lack of digital literacy skills hampers older adults to learn and use mobile devices, through their engagement with information as a crucial instrument for learning to use and manage their mobile devices.

Information literacy is experienced within an individual practice where information emerges as a product of this individual practice between older adults and their mobile devices. Although older adults experience a lack of digital literacy skills within this individual interaction, their desire or need to use mobile devices pushes them to interact with information in order to learn how to use them.

5.4.2.3.4 Helping others to learn

Some participants in this study help other older adults to learn to use their mobile devices. These participants indicated they understand the needs and concerns of others and they feel a responsibility or need to help them. Older adults revealed that they are aware of what others who take part of their social context are feeling, through what they are expressing and how they are acting. Peter, in the following quotation, shows how he feels empathy with older adults, and he acknowledges their needs, concerns and difficulties.

> *I am 74 and people with my same age don't understand the technology. They don't want to use it because they don't know how to do it. They don't see the potential. They don't like committing mistakes. It is a shame because I think older people, when they slow up and they want to talk to friends, and they don't want to drive anywhere, they can get an iPad and talk to them. So, if they could do it, they could use it. At their age, they need to be in contact with friends. I feel very ashamed. (Peter)*

Anne, during her interview, stated that she showed and taught her husband how to learn and use his iPad:

> *Yes, very easy to use the tablet now. And I've bought my husband one in September and I've showed him what to do with his. (Anne)*

Similarly, Ben helps his wife, Rose, to learn how to use her tablet. Rose said: "My husband shows me it. Yes, he shows me how to use it" (Rose)

Therefore, older adults experience information literacy through recognising others' skills gaps and need for help, and providing them with the help they need. In this case, information literacy is experienced within informal social practices such as conversations where information is shared as a product of a social relationship stablished with others within different contexts. Throughout this social interaction information is shared to help others to learn how to use mobile devices. Information literacy is a process through which older adults share their own knowledge by engaging with information as a way of helping others to learn and make use of their mobile devices.

The stimulus for engaging with information is triggered by internal factors; it is derived from the individual's social awareness and desire to help others to learn and use their mobile devices. Interviews suggest that this is related to being aware of the importance of learning and using mobile devices in today's society. There is conscious awareness of engaging in practices or behaviours which will help others to learn how to use their mobile devices in order to improve their lives.

Data suggests there is a conscious acknowledgement that mobile devices improve the quality of life of older adults and engaging in practices to help others how to make use of these devices could decrease the existing digital gap among this specific group of the population.

5.4.2.4 Managing use of mobile devices

5.4.2.4.1 Usability

All participants were aware of the mobile devices' characteristics related to their usability. The term "usability" is used here to describe the degree of ease of using mobile devices. Participants expressed an awareness of their devices' characteristics and how those characteristics impacted their ability to use them successfully.

Participants manage the use of their mobile devices according to their own needs, habits and likes.

With the exception of one participant, all participants recognised and discussed positive characteristics about their devices that impacted on usability, such as their:

- Portability: Mobile devices can be moved to anywhere easily due to their physical characteristics such as their small size and light weight.
- Ease of use: Their software design and friendly user interface are easy to understand, enabling easy use.
- Handiness: Mobile devices are useful and can be handled easily from anywhere.
- Convenience: Mobile devices make their life easier since they can be used at any time from anywhere.
- Diversity of uses: These devices allow multiple tasks such as listening to music, reading news, making phone calls and taking photos.
- Intuitiveness: Smartphones and tablets are easy to use and understand without explicit instructions, due to their interface design.

For instance, Ben and Claire talked about the diversity of uses of their mobile devices:

> *What would be the most beneficial aspect of using iPhone? Diversity of uses. It has such diverse uses, it is more than a phone. (Ben)*

> *Because it's easier to take the one device that'll do Internet, books, photos. Everything I need is just the one thing. (Claire)*

Portability was an important factor for Emma: “it is very easy for me to carry, it is small, it can fit into my handbag.” (Emma)

Marc states that the small size of his smartphone makes it handy and easy to carry with him, as he suffers arthritis:

> *It's easier to carry the mobile phone with me because it's small, the laptop is big and also, I have arthritis in my hands. (Marc)*

Anne and Ray stated that these devices are easy to use: "It is very easy to use the tablet." (Anne); "It's easy to use smartphones, tablets." (Ray)

While participants recognise the positive impact of device characteristics on usability, they also experience difficulties when they make use of their mobile devices. These difficulties are sometimes due to the physical characteristics of the devices, and also to the participants' physical issues and diseases such as sight issues. Sue said: "It is not very big. It's quite fiddly to try to write messages." (Sue)
In this case, the small size of her smartphone's screen makes it difficult for her to write messages. Similarly, Michael stated that he prefers using his computer to see information rather than his smartphone due to his sight issue and the size of his smartphone's screen:

> *Some people have tunnel vision…. If you run more than one application on your phone. If you divide it in half, very tiny screens. But on my computer, I've got two big screens and I can run several applications on both. I can just sort of move back a bit and I can see the whole lot. (Michael)*

Information literacy, in this case, is experienced through the usability of mobile devices. Each individual experiences the use of mobile devices in a specific and personal way, which impacts their manner of interacting with information using these devices.

5.4.2.4.2 Choosing how and when to use mobile

Findings, in this study, suggest that characteristics, habits and likes of each particular person exert an influence on the way they use of their mobile devices. Participants choose the way of using their mobile devices according to their particular characteristics, habits and likes.

All participants talked about how they use mobile devices and which devices they used, based on factors such as their location, the type of task, and the application that

they need to use. Ben and Sue describe how they prefer particular devices for particular tasks:

> *But if I have to read an article is easier to read it on the iPad than on the iPhone. (Ben)*

> *I don't use my smartphone so much to write emails because I find it's very small and when I have to type a long email I would rather do that on my tablet or on the computer. So, I mainly use it for making phone calls and to use WhatsApp, and to send texts. (Sue)*

Emma chooses to use her iPad when traveling to take advantage of its portability:

> *My tablet, I probably only take it on holidays with me to send emails and to record photographs, because I have a computer at home, and I do my emails and pay my bills with it. (Emma)*

Also, most participants decide the way of using their mobile devices according to the moment or place where they are. For instance, Emma said that she makes use of her tablet for listening to music in her car when she is travelling:

> *I take my tablet with me when I am travelling to my daughter's place or visiting to my friends on the coast, and I just plug it into my car and I can listen to all the music that I have in my place. (Emma)*

Peter, also, decides a particular moment to make use of his iPad according to his habits:

> *Peter: I use it usually in the evening, at night.*
> *Gema: Ok. Why at night?*
> *Peter: Because it is a quiet time for me. I think I am used to being an academic and I read at night, I study at night. So, I find this just the sensation of quiet. (Peter)*

Further, most participants limit the use of their mobile devices. The following interviewees control the time spent on their mobile devices:

Ben: I guess my concern is that I do not want to be so tired to communicate with people face-to-face, I see some people who are always on their phones
Gema: How much time do you spend using these mobile devices each day?
Ben: it is difficult to say. I think I don't use them for a long period of time often. For instance, my iPhone I might find initial details and then I go to my computer, but if I am out I use my iPad. I would say maximum an amount of time maybe on the iPad maybe one hour my iPad, and on the iPhone five, ten minutes maximum. But I use, through the day, my phone, five minutes here, five minutes there, phone calls, emails, sending texts, finding a location. (Ben)

Gema: Why do you play games?
Sue: Oh, quite sometimes, it's just to relax… Yeah, just for half hour. (Sue)

Gema: So, how do you consider the smartphone?
Betty: I think it is good if you use it properly
Gema: What does properly mean?
Betty: Properly means not to be on the phone all the time. Yes.
Gema: Do you have problems to control the time that you spend with your smartphone?
Betty: No for me. But a lot of people have trouble with the use of their phones. (Betty)

Thus, the primary focus, in this point, is on managing the use of their mobile devices. Information literacy would be seen as a process which enables older adults to manage the use of their mobile devices by engaging with information according to their individual characteristics, needs and preferences.

In this case, information literacy is experienced within an individual practice where participants manage the use of mobile devices and apps through their individual interactions with them, where information emerges as a product of the interaction

between each participant individually, and the use and management of their own mobile device as a tool to engage with information. Participants engage with information to reach a goal: making use of their mobile devices according to their personal and particular needs and preferences.

The stimulus for engaging with information is triggered by older adult's individual characteristics, needs and preferences to manage and use their mobile devices. Use of information occurs when the information acquired becomes personally meaningful or relevant in managing the use of mobile devices according to their idiosyncrasies.

5.4.2.5 Affective dimension

5.4.2.5.1 Positive feelings about learning to use/managing mobile devices

Most participants in this study revealed that they experience moments of achievement and happiness when they learn a new mobile skill, know how to use their mobile devices, or feel familiar with them. Older adults experience moments of accomplishment once they are able to learn and make use of their mobile devices.

Participants asserted that they feel good, confident, happy and secure when they make use of mobile devices in their daily lives.

> *Gema: How do you feel when you use Facebook?*
> *Emma: Very clever. (Emma)*

> *I feel very happy because I can use not only my mobile phone, I can also use my laptop, my computer and many other devices. (Marc)*

> *I feel good, I feel confident, I feel that I am learning, I am learning more all the time on the Internet and yes it makes me feel… Yes, I feel good, good about it. (Sue)*

This suggests that the use of mobile devices and apps provides a feeling of security, confidence and self-esteem to older adults. Emma certainly experienced an increase in her confidence on learning to use her mobile device:

> *Ok, I guess I've become more confident now if I can use this technology, I am more pleased with myself that I can comfortably use the smartphone and the tablet. Yeah, I think that it's given me more confidence… Confidence means when you feel good about yourself and you feel that you can do something that you didn't think that you could. Yes, when you achieve that, it makes you feel good. (Emma)*

Similarly, Sue said that she feels secure thanks to the use of her mobile devices:

> *I feel that I can be in constant communication with people who need to get in contact with me and I want to get in contact with them… I feel secure, I can reach other people (Sue)*

Therefore, the process of learning and using mobile devices has a positive impact on older adults. These positive feelings involve an individual interaction with their own mobile devices and apps through their information practices. Most times this individual interaction with mobile devices initially constitutes a difficult process for them, producing as a result these feelings of accomplishment, courage and happiness due to the big effort invested in learning. For instance, although Emma acknowledged that she feels more confident and clever thanks to being able to learn how to use her mobile devices, she still found the process challenging: "I had a lot of trouble learning, and I've made lot of mistakes." (Emma)

Information literacy is experienced as self-knowledge and confirmation of their own abilities through individual engagement and interaction with information while they are learning to use mobile devices and apps. Information literacy is also experienced as positive feelings when they learn a new skill. These positive feelings impact on the level of use and motivation of older adults with respect to the use of these mobile devices to interact with information.

5.4.2.5.2 Negative feelings about learning to use/managing mobile devices

Most participants experience negative feelings when they have difficulties learning or making use of their mobile devices. Some of them are concerned they may not execute tasks correctly, fear making mistakes, distrust their own capabilities, or feel alone when they are learning or making use of their devices. This feeling of

loneliness when they are learning to use their mobile devices could reveal a lack of support to help them to integrate their mobile devices into their lives. Therefore, the social context plays a crucial role at helping older adults to make use of mobile devices.

The following instances show how participants expressed these feelings:

> *I guess that there isn't anything scary. And I can make mistakes, I just press the wrong there is always… I can find it on the top and I always press the wrong icon and I am going to do something wrong during this which frustrates me, because it frustrates me. (Rose)*

> *I feel bad. First time that I made mistakes I thought: I can't do it. (Peter)*

> *I just do it, I am alone. I learn alone, and I go on learning alone. (Sue)*

Further, some of them feel forced to learn and use their mobile devices due to the social pressure, such as Emma:

> *We have to know how it is, if we don't, if I don't use my phone, or I don't use my computer I'll be lost because this is the way, it is used more and more and more.* (Emma)

This might have a negative impact on their desire and attitude towards learning to use their mobile devices.

Finally, most participants experience negative feelings when they are not able to solve an issue about the use of their mobile devices:

> *Gema: When it is difficult to use some apps how do you feel?*
> *Betty: I feel annoyed, I don't understand. I am afraid. (Betty)*

> *I get, I am being annoyed with myself when I can't do it. (Emma)*

It is clear that all these factors hamper the adoption and use of their mobile devices through their experiences with information. Rose stated:

I am not very good. So, I can say I don't like using the smartphone or tablet too much. I am getting a little scared of them. (Rose)

5.4.2.6 Summary

In *'Learning to use and manage mobile devices'* all older adults in this study showed that although they have strategies to learn and manage the use of their mobile devices by themselves, they require and receive support from others, mainly from relatives and friends, in order to learn to use and manage them.

In this category, they experience information literacy not just through their engagement with information to learn and manage the use of their own mobile devices; but also, they engage with information to help others to learn to use mobile devices, by sharing their own knowledge and experience.

Although most older adults revealed that they experience positive feelings when they learn to manage and use their mobile devices, they also experience negative feelings due to a lack of digital literacy skills mainly, which impact on the adoption and way of using these devices.

Older adults experience information literacy through the following information practices: analysing, finding, sharing and using information within individual and social practices, in different contexts: family, friends, in their work and community.

5.4.3 Category 3. *Being entertained*

I probably use it the most for games, I use them for one, maybe two hours if I have time, it is a form of relaxation… I sit down, and I do puzzles. That's mainly for what I use it. That's it. (Rose)

Most participants make use of their mobile devices for entertainment. In some cases, participants stated that they have more free time because they are retired (for example, Peter, who stated he reads more on his iPad because he has more free time), thereby increasing the time they spend using mobile devices for entertainment.

Participants experience mobile devices as entertainment tools, using a diverse array of applications for entertainment and leisure activities. For some participants, entertainment and relaxation activities are the key uses they have for their devices.

Therefore, the motivation for engaging with information is triggered by the need to be entertained and pass the time. They use the information obtained for keeping entertained.

Participants entertain through diverse types of content (music, games, movies, news, articles, books and videos) in a variety of formats (audio, visual and text).

5.4.3.1 Playing games

Older adults in this study revealed that they make use of their mobile devices for playing games as a way of entertainment, like Emma revealed in her interview:

> *And if I have some spare time, and I think oh! What could I be doing? And I've gone to the Spider Solitaire. (Emma).*

Similarly, Claire said:

> *I play Solitaire and Free Cell, and I downloaded a couple of Jigsaw ones that I play with my four-year-old granddaughter. (Claire)*

Older adults revealed that they have specific personal interests and needs, which exert an influence on the way they use their mobile devices, through their experiences with information. Some participants revealed that they don't share the same interests with other generations. In this sense, they select different types of games to play than younger generations. Peter stated:

> *I think younger people love games and play a lot. I'd probably play cards but I am not terribly interested in games. (Peter)*

5.4.3.2 Reading

Most participants talked about how they make use of their mobile devices, mainly their tablets due to the screen's size, for reading books for entertainment. Louise

said: "I use it when I'm reading a book or reading a newspaper." (Louise). Emma also revealed that she uses her tablet for reading:

> *I have books on my tablet. I love it, it is very easy for me to take my tablet with me on the plane. I can read books. (Emma)*

Also, participants in this study revealed that they search and control information purposely. They control information by storing and retrieving it later. For instance, Claire, in her interview, said: "I download a whole lot of books to read while I'm away." (Claire)

Participants shared that they search, analyse, select and store the content to read according to their needs and interests. For instance, Peter said: "I go onto my favourites websites that I want to read." (Peter); also, he stated:

> *With the tablet, I can get it to use it as a sort of kindle where I can search for articles and read books. (Peter)*

Similarly, Emma shared:

> *I just open the kindle site and if there is any book that I'm interested in or a good book, I download it to my tablet. (Emma)*

5.4.3.3 Listening to music

Older adults also shared that they listen to music on their mobile devices, like Rose stated in her interview: "The other thing that I do with my tablet is music" (Rose) or Peter said: "I sometimes play music" (Peter).

They see information as an instrument to satisfy their interests and needs. Their engagement with information fulfils a purpose. Participants select the content with the purpose of *Being entertained*, keeping up to date with news and world events, or listening to their favourite music. The following quotations show how participants select the type of content according to their likes and needs:

> *I use YouTube for music sometimes, if I want to listen some songs. (Sue)*

Gema: Why do you use the radio on your smartphone and not the regular radio?
Marc: Because I want to listen Persian radio and the radio at home just speaks in English. (Marc)

With iTunes, you can get and send your music now. So, what I do is to get through and pick the music that I want, and I take it and I put it in a bundle on there and then play. You can make your own music. (Peter)

Findings in this study reveal that most participants are able to get and store their own music from mobile apps to their mobile devices like Ben said: "I've just gone on iTunes I just download music, Christian music." (Ben)

5.4.3.4 Watching videos and movies

Some participants in this study also talked about how they make use of their mobile devices for watching videos and movies to be entertained while travelling, as Emma shared: "I put two movies on my Tablet when I went overseas by plane and I saw them" (Emma); Marc also described how he watches movies using his smartphone: "I go to YouTube and I write the title and search the movie and I watch the movie" (Marc).

5.4.3.5 Summary

All older adults in this study experienced *Being entertained* through mobile devices. Thus, in this category the focus of older adults' information literacy experience is to be entertained. They experience information literacy within individual practices: listening, reading, watching or playing individually, where information emerges as product of their individual need of being and keeping entertained using mainly mobile apps. They make use of a diverse array of mobile apps for entertainment and leisure activities such as iBook, iTunes, Kindle or YouTube where they engage with information through a very rich and diverse array of resources (videos, games, music, movies, and books). Thus, mobile apps constitute an important source of information used by older adults for being entertained or for relaxing.

In *'Being entertained'* information literacy would be experienced through the following individual practices of information: analysing, finding, managing and using.

5.4.4 Category 4. Enacting everyday life

> *I told you that I can't live without them. I use it very often. It is very important, not just for my life, social life, family life, but also, for my business life, business actions, you know. (Ray)*

In this category, participants experience mobile information literacy as enacting everyday life. Mobile devices are an integral part of participants' lives, both personal and professional. Most participants suggest that mobile devices have improved and changed their personal and professional lives.

Mobile devices are key tools for older Australians to enact their everyday information literacy experience, where information is considered an essential tool to be able to manage and develop their daily tasks. Thus, information literacy in this category is enacted through executing everyday life tasks.

Hence, their information practice, in this category, is very active in nature. The information found, shared and received is going to represent new information; it has not been previously acquired or known. They are conscious that they need that information to enact their everyday life. There is an identified purpose for seeking and finding information and once obtained this is used in an imminent manner or stored for future use.

5.4.4.1 Mobile devices are integral to everyday life

Once older adults start using mobile devices and become familiar with their use, these devices become an integral part of their lives. Most participants in this study indicated they would find it difficult to live without them. Participants suggest that it is necessary to have mobile devices in today's society.

> *Yes, I think it's… they become essential, so that's more important because it's now a way of life. (Michael)*

> *It's my life, without this I couldn't live. (Ray)*

Participants manage many daily tasks through the use of their smartphone or tablet and are increasingly integrating their devices into their daily lives. Their mobile devices are their primary tool for communicating and getting information, and they use them to plan, shop, read and many more activities. The mobile devices' properties and features such as their accessibility and ease of use contribute to these devices becoming essential tools in their daily lives.

Participants always or almost always have their devices in their hand or close to the body. "I have not got it surgically planted into my body yet, but I carry it with me all the time." (Ben) They have their mobile devices with them even when they are not using them: "It is even on the bed at night. So, I have it all the time." (Ben)

Older adults in this study experience an affective relationship with their mobile devices and feel attached to them. The following quotation shows how mobile devices became affective technologies:

> *It is one of the most important things in my life, the technology, the iPad, the smartphone, the computer. I would rather it than the television. You know, rather than other things. (Sue)*

Participants in this study identified openly that they experience an affective relationship with their mobile devices. Anne said in her interview: "I love my iPad." (Anne). Similarly, Emma stated:

> *I love my phone, I do it… I'm very happy using my smartphone and I am pleased to have got one, and when it breaks down I'll get another one. (Emma)*

Information literacy would be seen as a process which enables older adults to make changes in their lives, by integrating mobile devices into their engagement with information, as an essential instrument to develop everyday tasks by experiencing positive change. Information is used to experience positive changes in their lives.

5.4.4.2 Completing the tasks of everyday life

Findings in this study reveal that the use of mobile devices impacts the lives of older adults positively. Participants said that their lives had improved through their experiences with information using mobile devices to complete everyday tasks. The everyday tasks they complete are outlined in the following sections.

5.4.4.2.1 Communicating with others

Most participants manifested that mobile devices are useful for communicating with people, particularly with relatives and friends, at any time, from anywhere and immediately, thanks to the properties of these devices, as Peter revealed: "I don't have to drive with my car to some place I can just be at home and talk to them." (Peter)

5.4.4.2.2 Banking

Older adults in this study talked about how they make use of mobile devices to manage their finances. They access information about their bank accounts from bank websites and through banking apps, using their smartphone or tablet. Some participants considered that these devices are good and convenient because they allow them to control their bank accounts and transfer money, as Sue said: "I can see what's happening in my account, which is very good… you can move money from one account to another one" (Sue). The devices also allow them to and pay their bills from anywhere and at any time, as Betty revealed in her interview:

> *It's set up for paying bills. I don't have to go to the post office to pay. I just click on here and I pay the bill… Just I go to the banking app and just I pay the bill, Telstra bill, electricity bill, any bill, everything. (Betty)*

5.4.4.2.3 Shopping

Some participants stated that they make use of their mobile devices to look at and buy anything that they want from websites, like Peter:

> *I don't like all types of wine, so this site sells wine, I can go into the site, I look at the special ones and I look at and buy the wine online. (Peter).*

And other participants, like Betty, use apps such as Gumtree, to seek and find information about anything that she wants to buy:

> *There is another site, it is called Gumtree… And you can buy furniture, anything on Gumtree. Just you look at it on the phone, on the app and you can find anything that you want. (Betty)*

5.4.4.2.4 Travel planning

Most participants in this study revealed that they plan trips or meetings using their mobile devices. Rose, in the following quote, shows how she makes use of a particular mobile device app for seeking information and uses it for planning trips:

> *Rose: I have an app Round to Real, which I look at when I am going overseas, I work out a date and when I travel from a place to another place, when I am going by train, by bus. It sets it up for me, so I use it a lot.*
> *Gema: When do you use this app?*
> *Rose: For travelling, planning. (Rose)*

5.4.4.2.5 Seeking information to help with health conditions

Some participants claimed that they seek information through different information sources, using their mobile devices, to improve some of their health issues and diseases. In the following quotation Marc described how he seeks information to improve his arthritis through the use of YouTube or Google:

> *Because, for example I have problems with my fingers and I went to YouTube or Google and I found a medicine, for example, Turmeric. (Marc)*

5.4.4.2.6 Solving problems

Some participants stated that when they have any difficulty with their mobile devices, they search information about how to solve it through the use of different information sources such as: Internet, forums or, as Sue stated during her interview, she makes use of help on-line from Apple:

> *I even look on the Internet how to solve that problem. I type the problem on the Internet.*

Gema: Good
Sue: And they give me some answers and so, I try this or that. And I go and follow forums where some people are discussing, and they say things. And I've got some advice as answers from there. And also, I stay in touch with Apple Help, if I have a problem with the iPhone or the iPad I might actually go into the Help line from Apple and I'd try it and I'd get some answers from there. (Sue)

5.4.4.2.7 Learning how to cook

Some participants search information using their mobile devices, in order to find cooking recipes or learn how to cook better food. The following quotes show how Betty and Sue revealed that they look up information to learn how to cook recipes and about healthy food:

Betty: I look information about different things, for example about healthy eating.
Gema: Oh, could you explain more?
Betty: Well, they tell you about the best way to cook vegetables, for example. (Betty)

I use YouTube sometimes, for instance, how to make jam or how to make something, how to do something. I put it into YouTube and I look at the different videos to help me to cook recipes or anything like that. I am going to YouTube and it shows me the videos and I can say: oh! I can do it like that. (Sue)

In this point, information literacy would be seen as a process which enables older adults to complete the everyday tasks using their mobile devices. The primary focus is on purposeful identification of how to manage and complete everyday tasks. Thus, the stimulus for engaging with information is triggered by a specific personal or professional task which emerges as a product of their everyday lives. Retrieval of information occurs through the use of a rich and diverse array of resources. This includes advice from experts or people who share comments and answers on Forums on the Internet about specific issues, as well as more informal information sources

such as conversations or videos through the use of social networks (YouTube or Facebook) or communicating apps such as Skype or FaceTime.

5.4.4.3 Improving everyday life

Participants suggest that their lives have improved thanks to their use of mobile devices. Participants claimed openly that their social lives, emotional wellbeing, health and quality of life have improved thanks to the use of these devices.
The interviewees pointed out that now they communicate better with others thanks to these devices. This is due to the wide range of communication tools that mobile devices provide, to connect and stay in contact with people. For instance, the following quotations show how Michael and Claire perceive a strengthening and expanding of relationships, which has a positive impact on their social and family lives.

> *Michael: Ah, I don't know. I mean, it's probably helped me to be more of a social person… I mean, it's easier to contact people, so you can arrange to meet them, say for coffee. (Michael)*

> *I have much better communication with my children when they're at a distance. It is probably the most important thing to me. I can talk to my grandchildren and see things. I mean, I had kids overseas before there was Internet, and you know the letters would take weeks to arrive. (Claire)*

Participants are able to access information independently, at any time, anywhere, and immediately, thanks to the properties of mobile devices.

> *Where it was before, probably, to find information and see things, might have been too hard having to research it. When you've got this little piece of equipment and just can talk to and look at the information straightaway. (Emma)*

> *You can inform yourself and you feel more better (sic) informed about a lot of things. (Sue)*

This improves their lives by learning new things and keeping them up-to-date, informed and active into the today's society.

The ability to execute personal administrative and work tasks as part of their everyday lives, from anywhere, without the need to move physically, is advantageous for participants. Being able to conduct their personal and work business via their mobile phones helps them to save time while doing these tasks.

> *It saves time… It saves time means that I don't have to go to the post office to pay bills... I just can pay it on the phone… It's set up for paying bills. I don't have to go to the post office to pay. I just click on here and I pay the bill. (Betty)*

> *It is easy much easier to find information… In the past some tasks were very time-consuming tasks (Peter)*

Mobile devices also have positive financial benefits because they allow participants to find the cheapest options for goods and services. Participants use their mobile devices to find and access information about how they can get the cheapest products and services. Participants spoke about planning travel and taking advantage of their mobile devices to find the cheapest travel options:

> *Gema: Could you tell me why you choose this way of booking holidays using your smartphone?*
> *Betty: Because it is cheaper booking on line. Yes, booking online is cheaper. (Betty)*

> *The app is called Round to Real and you put in your starting place and your destination and it would map out how to get there, map out the route, it would map out the time and when are you going to go by train or when are you going to go by bus or when are you going to drive, or by taxi and they tell and show you the best way to go, and also the cheapest way. (Rose)*

Additionally, participants use their devices to find cheap options for various purchases. For example, Betty spoke about Gumtree: "you can buy furniture,

anything on Gumtree. Just you look at on the phone, on the app and you can find anything what you want." (Betty). Older adults, in this case, experience information literacy as searching for and finding information about goods and services to allow them to locate cheap options.

The stimulus for engaging with information is derived from their need to find and get access to goods and services according to their financial situation.

Hence, in this point, older adults experience information literacy through mobile devices as making a positive difference, as they focus on the devices' influence over their own lives. Learning is about becoming able to apply knowledge to the development of daily tasks using their mobile devices, in order to bring about positive changes in their lives. They are aware that their information practices using mobile devices are powerful and useful to change positively their own lives in different social contexts (work, family or community).

5.4.4.4 Using mobile devices for work

Participants who have jobs or businesses make use of mobile devices and apps to develop and achieve their professional goals. Work is a significant part of the life of working older adults. Participants consider mobile devices easy and helpful tools for developing their jobs, through their experiences with information.

Participants engage with information as part of their work lives in various ways. Some participants obtain relevant information related to their work from Google, websites or apps using their mobile devices, in order to keep up-to-date. For instance, Peter revealed that he makes use of different websites, as an academic, to be updated by particular researchers:

> *Well, you know from my academic background there is one in Scotland, called The Centre for Lifelong Learning. That's the site I go to because I have got friends over there and they have conferences, write papers. So, I use this site a lot. There is other site that I use, it is called Pascal Observatory, it is international, they do a lot of working in regional development, and learning cities and community development, and I am*

> *interested a lot in all these things. So, I suppose that I just try to be updated with those researchers. (Peter)*

Many participants like Ray stated openly that seeking, finding and sharing information is essential to develop their professional tasks:

> *I require information in order to do my work, to accomplish my goals. Basically that's the reason. (Ray)*

Some participants create and share information and knowledge related to their work with others (work colleagues, students and other professionals) through apps. Ben said:

> *When I am with students, you know, students might ask me about something like adjectives, so I have my iPad and I go to the app and show them the information. I think that it is maybe more effective, more efficient. (Ben)*

Ray makes use of his mobile devices to expand his work into other geographic regions. He revealed that he makes use of his mobile devices to expand his apostolic work as pastor in a religious institution:

> *Well, first of all I mean, we're involved in the Ministry and I am talking about religious Ministry. We are related to involve with an apostolic company which missions throughout the world and they gain emphasis about the responsibility of spreading speaking nations in the world, in South America, South, Central and America and the Caribbean Islands, speaking missions. So, to develop or to do this sort of work it's easy with the use of smartphones, tablets. (Ray)*

In this instance, mobile devices allow workers to keep in touch and up to date.

Information literacy can be seen as a process which enables older adults to develop their work through their engagement with information using mobile devices, where information is a crucial instrument to develop their work by creating, finding and sharing information and knowledge. Their stimulus for engaging with information is

triggered by an individual and social commitment to develop their work or to be active and updated professionally.

Information sent and received, in this case, represents new information, as it has not been previously acquired or is not yet known. Participants share and receive information through the use of a rich and diverse array of resources. This includes articles, papers from researchers or experts who share them on websites, as well as more informal information sources such as conversations through the use of communication apps such as FaceTime, Skype, Zoom or by email. Thus, information literacy is experienced not just within formal social and individual practices (articles, papers and conversations with researchers and experts), but also within informal social practices (conversations and exchange of information with work colleagues).

Information emerges as a product of social relationships with others within work contexts, understanding the development of their work as an important part of participants' lives. It can also emerge as an individual interaction with their mobile devices, where mobile devices and their apps are used as tools to create, search and share information related to their work.

5.4.4.5 Summary

'*Enacting everyday life*' is a strong category that emerged from the data. All older adults revealed that they manage, develop and complete the tasks of their daily lives using mobile devices, within different contexts (family, work or community), through their engagement with information, which emerges from their individual need to enact and manage tasks of their daily lives.

Older adults experience information literacy not just within individual practices where information emerges as a product of their individual interaction with their mobile devices, as a tool to engage with information; but also, within social practices where information emerges as a product of their social relationships with others within different contexts. Understanding the development and completion of everyday tasks is an important part of their lives. In this category information

literacy would be experienced through the following practices of information: analysing, becoming better informed, creating, finding, managing, sharing and using.

5.4.5 Category 5. Learning

> *Because I learn everything through the use of my mobile phone… When I search for information, that activates my memory and then it helps me to train my brain. (Marc)*

Participants in this study use their mobile devices to learn and acquire new knowledge about a range of subjects. Ongoing learning and knowledge acquisition is important to participants, who described how they learn through their experiences with information using mobile devices. When they search for or access information, look and compare different sites, or exchange information to find out about something, they understand this to be a process of learning and acquiring new knowledge. In this way, information literacy is experienced as learning. They make use of their mobile devices as learning tools for learning languages, about the Bible, and other topics of their personal interest.

Further they perceive that mobile devices are helpful and good tools for help them to train and keep their brain active. Most participants stated that they make use of their mobile devices as learning or mental training tools.

Older adults, in this study, revealed that they are aware of the benefits of using mobile devices to improve their skills, knowledge and capabilities, and thus improving their lives.

5.4.5.1 Desire to learn and its benefits

Participants understand learning as the activity of acquiring knowledge through finding, obtaining and analysing information using their mobile devices.

> *Betty: Now, it can be a bit more knowledgeable*
> *Gema: What does knowledgeable mean?*
> *Betty: Knowledgeable means that I learn a lot of information. (Betty)*

Learning and acquiring knowledge is important to most participants, it plays a crucial role in their daily lives. They need to learn and know in order to improve their health, solve issues, keep up about their areas of interest, increase their knowledge and satisfy information needs. When asked why it is important for him to learn, Mark explained how it is important to acquire new knowledge about his health condition in order to improve it:

> *Because, for example I have problems with my fingers and I went to YouTube or Google and I found medicine, for example, Turmeric. Turmeric is good for arthritis or tahini with sesame or honey, you mix them, and they are good for arthritis. (Marc)*

Participants also revealed that they are aware they don't already have all possible knowledge and so they need to learn. This was shown by Peter, during his interview:

> *I am also interested in ageing, older people, and the problem of ageing. So, I've got sites where I read about it and share with other people. Yes, I learn, I think I don't know it all. (Peter)*

A desire to learn is also attributable to participants' backgrounds. For Peter, learning played a key role in his work context:

> *Gema: Thank you. For you, why is important to find information?*
> *Peter: Yes, it is, it's just probably my background, I am an academic, your work is always learning. You never stop learning. (Peter)*

Therefore, the social context where older adults develop their work is going to exert an influence on their level of motivation to learn.

Information literacy would be seen as a process which enables older adults to learn and acquire knowledge by engaging with information via their mobile devices. Learning and acquiring knowledge are important to participants, and this occurs through the discovery and acquisition of new information using their mobile devices. Thus, older adults seek information purposefully. They seek information in order to know. The stimulus for engaging with information is their individual desire and need of learning and acquiring knowledge.

The overall information practice in this category is very active in nature, as there is conscious awareness of a learning need and an identified purpose for finding information. Once obtained, this information is used in an immediate manner in order to improve their health, develop a work task, or solve an issue derived from their daily tasks. Information is seen as a crucial instrument to learn and acquire new knowledge.

5.4.5.2 Use of mobile devices for learning and its impact

The mobile devices' property of providing access to information straight away from anywhere, at any time, makes it easier to get information and be informed when they need or desire. According to the findings in this study, the information obtained thanks to this mobile device property is what makes the user feel more knowledgeable and clever. Emma indicated this, during her interview:

> *Where it was before probably to find information, and see things, it might have been too hard, having to research it. When you've got this little piece of equipment and just can talk to and look the information straightaway. And it's… Yeah, I probably… I've become a little bit cleverer probably. (Emma)*

Therefore, participants feel and become cleverer and more knowledgeable when they learn and acquire new knowledge through their information practices using mobile devices. This makes them feel better with themselves. For instance, Sue stated that she gets this feeling when she learns and obtains knowledge about new things.

> *Sue: …it makes me feel better when you're learning things and you're knowing things even if you're just learning about something on the Internet and it is makes me feel better about yourself, in yourself.*
> *Gema: In what sense?*
> *Sue: In a clever way, because you can inform yourself and you feel more better (sic) informed about a lot of things. (Sue)*

5.4.5.3 What they learn about and how they do it

Many participants stated that they learn languages through the use of learning apps such as Duolingo or Memrise. For instance, in the following quotations, Betty and Michael manifest that they make use of this type of apps:

> *Gema: You told me also that you use apps for languages*
> *Betty: Yes, languages, to learn speak Spanish. It is interesting learning to speak properly the language. I use the app Duolingo. (Betty)*

> *Michael: I'm only interested in Spanish. And you see, Memrise is the same. They're both for Spanish.*
> *Gema: Oh, Memrise.*
> *Michael: Yes, it's Memrise.*
> *Gema: Memrise is similar to Duolingo?*
> *Michael: Yes. Similar, but… yeah, see, again, I've selected Spanish, but you can use that app to learn French or Italian or…*
> *Gema: Then, you use your smartphone to learn?*
> *Michael: Yeah. (Michael)*

Other participants, like Ben, revealed that they make use of the Right Now media app to learn about the Bible in a group, by accessing its videos:

> *my wife and I meet with other people every Monday night and we study the Bible, we pray together, we have food together, we laugh, we have fun. We also do things together. But I can go onto Right Now media and I can get some very best speakers around the world who do a presentation. I can put on the screen and the whole group can watch it. (Ben)*

Also, Sue revealed that she makes use of YouTube to learn by watching videos about how to improve her health and how to cook recipes:

> *I use YouTube sometimes. For instance, how to make jam or how to make something, how to do something. I put it into YouTube and I look at the different videos to help me to cook recipes or anything like that. I am going to YouTube and it shows the videos and I can say: oh! I can do it like that. (Sue)*

In short, participants showed that they learn languages, about the Bible, and other topics of particular interest for them, through their information practices using mobile devices and apps, where the use of information occurs when the newly acquired information is considered relevant and it is included as part of their own knowledge.

5.4.5.4 Summary

In *'Learning'* the focus of older adults' information literacy experience is to learn and acquire new knowledge. Their engagement with information is purposeful, which emerges not just from their individual need and interest in learning, but also from their social relationships with others where they learn through the exchange of information using their mobile devices.

In this category information literacy is experienced through the following individual practices of information: analysing, finding, sharing and using information.

5.4.6 Category 6. Managing relationships

> *When you're old, you need to talk to people, you need to keep in touch with your friends. (Peter)*

Managing relationships in this study involves being able to keep and strengthen social relationships with family, friends and work colleagues, and also to expand new social relationships with others, whose interests, concerns and needs are similar.

In this category, communication plays an important role in establishing and maintaining social relationships. Communication is not just an exchange of information; it also helps to maintain a sense of identity, and relieve loneliness, depression, or anxiety (Yorkston, Bourgeois & Baylor 2010; Cotten, Anderson & McCullough 2013). Communication also allows older adults to exert an influence and to help others by listening, reflecting, and offering advice. Participants experience positive feelings when they are able to establish and maintain social relationships by communicating with other people through the use of their mobile devices.

Most participants revealed that they make use of their mobile devices mainly to manage their social relationships by communicating with others. They understand mobile devices as communication tools, fundamentally. In the following quotations, Peter and Ben state that they make use of their mobile devices primarily for communicating with others:

> *I use it in a number of ways, but mainly for communicating with people through the email. (Peter)*

> *I use my smartphone in a variety of ways, but primarily as a telephone. So, for both making calls and receiving calls. I've also used it for texts, sending texts, receiving and sending texts. I use my smartphone for emails. (Ben)*

Some participants of this study indicated that they prefer using their mobile device rather than their landline for making and receiving calls. They revealed that they are increasingly changing their usual communication tools (landline phone or written letters) for the use of their mobile devices, to manage their social relationships. The more they perceive the benefits of using mobile devices for communicating, such as the low cost and their easy and quick way for contacting others in case of an emergency from anywhere, the more they make use of them. Louise said:

> *I use it to make phone calls and increasingly I find that I use my number for people to ring me instead of the landline. (Louise)*

For older adults, being able to establish and maintain social relationships through their information practices using mobile devices is very important. Relationships constitute a very important part of their lives, and often make them experience positive emotions, and contribute to an individual's sense of well-being, self-esteem and security. According to the older adults who participated in this study, mobile devices are helpful tools to manage their social relationships, due to the mobile devices' properties. These devices help them connect with their family and friends at any time, from anywhere, and thus help them to manage and expand their relationships. Mobile devices provide them a feeling of safety because they allow

them to be contactable and to contact others at all times. As the literature review revealed, for participants in this study maintaining ties with other people is an important element of successful aging, thereby avoiding social problems such as isolation and loss of self-esteem. Thus, mobile devices play a significant positive role in the ageing process for participants in this study by helping them to stay connected.

Thus, this category would be one of the most significant in this study, since it is one of the main reasons revealed by older adults to push them to use mobile devices.

5.4.6.1 Feeling connected, safe and secure

Managing their social relationships using their mobile devices, throughout the communication process, provides older adults with emotional benefits. Their communication-based information literacy experiences provide older adults a link with their relatives, work colleagues and friends, helping them to feel connected generally. This feeling of connection in turn helps them to feel safe and secure.

Participants revealed that they feel safer and more secure, more comfortable, and also better than in the past without the existence of mobile devices, when they are able to contact and communicate with others using these devices.

> *I don't feel cut off or fear, and I feel that I am not cut off from anybody else and it makes me feel better. (Sue)*

> *Sue: I feel that I can be in constant communication with people who need to get in contact with me and I want to get in contact with them.*
> *Gema: So, that's the most important reason for you?*
> *Sue: That's right. It is the constant communication. Yeah, the constant communication… Yes, it is the most important for me… I feel secure and I can reach other people. Yeah, absolutely. (Sue)*

Mobile devices also provide participants with a sense of safety in urgent or emergency situations because they are able to store, access and retrieve data, mainly telephone numbers and contact details of people.

I open it straightway and I have all my contacts, people I would like to talk to, I can find my daughter, I touch it and I am talking to her. It's not difficult. It's not confusing, it is very easy, it is straight away. (Peter)

This feeling of safety is not just experienced by older adults, but also by their relatives and friends. Emma, in her interview, said:

When I visit my daughter in the town she likes that I take the mobile with me in case of my car breaks down. So, for that reason, it is very convenient for me to have it. (Emma)

5.4.6.2 Engaging with family and friends

Most participants revealed that they make use of mobile devices and apps within groups of family or friends where they exchange and share information (ideas, opinions, comments, photos and new knowledge). For instance, Claire stated: "When we're overseas, I send a photo and a message of where we are to a family group." (Claire).

Participants revealed that they share personal information about their lives just within groups of family and friends. For instance, Sue said:

Well, I put pictures on my Facebook page, only on my page. And then people that they are my friends can see them, yeah. (Sue)

5.4.6.2.1 Feeling the need to keep in touch with family and friends

Most participants manifested their need to be in touch with relatives and friends, mainly who live far away, and they expressed their need to feel them close. In this regard, being able to manage and strengthen their social relationships is one of the most important activities to do with using their mobile devices through the use of communication apps such as FaceTime and Messenger, the use of email and also Facebook.

Older adults in this study meet their need to feel close to relatives and friends, by the use of their mobile devices through their experiences with information. The

following quotations show how some participants experience their need to be in touch with family and friends:

> *Well, that's probably it. It's being able to stay in touch with the family when they're away or the ones that don't live here. (Claire)*

> *I have my grandchildren and I love to keep in touch with them with my mobile phone. (Emma)*

In the interviews, the reasons for retaining close communication ties with their families don't emerge directly. However, most participants revealed a certain concern about their family and friends, maintaining parental and grandparental roles. For instance, Betty claimed that she sends messages using her smartphone to know how her friends are:

> *Yes. Well, if I go with my friends outside for a coffee or I am going to visit friends, I send them a message and I say them: are you at home? Yeah. Just let people know how I am. Just to see that my friends are ok. (Betty)*

Also, Anne and Claire, during their interviews, revealed that they make use of their iPad for keeping in touch with her children and grandchildren, who are far away:

> *Now they're not coming home for Christmas, so Christmas Day, I have a granddaughter and there's two children, two granddaughters. Both my son and my daughter-in-law have iPhones and my granddaughter has an iPhone, a prepaid, and I can just call them now on Christmas Day and speak to them. (Anne)*

> *Gema: When do you use FaceTime?*
> *Claire: Our granddaughters live in Melbourne, so we use it to talk to them, and we use it to talk to the kids if we're overseas. (Claire)*

All participants except Betty, who has no children, made mention of their children and grandchildren, revealing the crucial role that these younger relatives play in their lives. Thus, this is the primary focus: to be in touch with family and their need to stay connected.

5.4.6.2.2 Facebook as a tool for handling family and social relationships

Most participants in this study revealed that they make use of Facebook to manage their social relationships. For older adults, connecting with relatives, friends, work colleagues and others with interests similar to theirs, tends to occur often on Facebook. They make use of Facebook as a tool to keep up-to-date and in touch with their family and friends' lives, and with the work colleagues' professional tasks, by giving their personal views and writing comments about information shared by them. They also keep them up-to-date with information about their lives, by sharing information throughout pictures mainly and by seeing the comments shared by them. Facebook constitutes a popular locus for connecting with family and friends, particularly with those who live far away, in other states or overseas.

In this study the desire to stay connected with family and keep in touch with old friends is the main stimulus for making use of Facebook, followed by the desire to find and communicate with like-minded people. For instance, Sue and Marc stated that these motivations push them to use Facebook:

> *I use Facebook mainly for pictures, yeah. To stay in touch with my friends, yeah, to have regular communication with friends and family. (Sue)*

> *I feel very good because I get a lot of friends and I meet a lot of friends but also many friends that I have never met before from other countries, other cities. I have many friends. (Marc)*

Further, older adults in this study showed they are motivated to use Facebook as a form of social surveillance, understanding surveillance as checking out what people are up to. This is something that most participants do. They want to see what their relatives, children and grandkids mainly, are doing. This is indicated in the following quotations, where participants revealed their interest in being informed about their relatives' and friends' lives:

> *I use Facebook to stay in touch with my friends, to see what they are doing. Because they put on Facebook what they are doing, and I just put*

> *my friends' name Maria and I can see that Maria went to Sydney last week for a week. (Betty)*
>
> *It's lovely to be able to see what's happening in their life and they can see what's happening in my life. (Emma)*
>
> *And it lets me see what my nieces and nephews and close friends' children are doing around the place because a lot of them are overseas. (Claire)*

The findings of this study show that chatting via messenger and posting comments and pictures are the main activities of older adults on Facebook. The following instances show how participants make use of Messenger, and post comments and pictures on Facebook.

> *Facebook, I use it to put pictures normally or something if you have an event or something special that it has happened I put pictures on Facebook and then I usually… it's nice that other friends to make comments, they answer and give me the thumb up or put their comment under the picture. So, yes, I use Facebook mainly for pictures, yeah. (Sue)*
>
> *Gema: How do you stay in contact with your family throughout Facebook?*
> *Betty: Through messenger on Facebook. (Betty)*
>
> *When I go overseas on holidays I put photographs on Facebook and yeah it is a great medium. (Emma)*

Therefore, information literacy would be experienced as trying to keep in touch with family and friends, using their mobile devices. The primary focus would be on how to overcome the need to retain close family and friend ties. In this case, the stimulus for engaging with information is derived by the individual need and concern of keeping in touch with family and friends. They use information because of their desire, need or concern to know about how their family and friends are and also to

keep in touch with them. Information literacy would be experienced, in this case, within informal social practices such as conversations with relatives and friends through the use of communication apps such as Messenger or Facetime; email by sending messages; and also, Facebook by sharing pictures, comments and views and accessing information shared by others.

Further, information literacy would be experienced as a process which enables older adults to make use of Facebook, using their mobile devices, to engage with information as a way of handling their relationships. Information literacy, in this case, would be experienced within:

- Individual practices: Participants share information on Facebook for keeping their friends and relatives up-to-date about their lives through their access and interactions with mobile devices, where information emerges as a product of their individual and personal desire of keeping in touch with relatives and friends, and to keep them informed about their lives.
- Informal social practices: Participants engage in conversations and discussions, by chatting through Messenger on Facebook, and by posting comments where they express their opinions or views. In this case, the information emerges as a product of social relations with others. Through these individual and social practices, information is used as a way of handling and strengthening their family and social relationships.

5.4.6.3 Participating in groups or communities

Most of participants revealed that they manage their relationships by interacting with each other, exchanging and sharing information within a group or community. Older adults make use of mobile devices and apps in formal communities (e.g., academic or ecclesiastical communities) where they exchange and share information (ideas, opinions, comments, photos or new knowledge).

The use of mobile devices offers the possibility to interact with more than one person at the same time, from different places. For instance, Peter during his interview said that he makes use of his iPad to talk to people from different places about a common area of interest:

> *Although I am retired, I was 30 years working here, but I still teach some of my doctoral students, and I use the iPad with the FaceTime, the Zoom. Those are apps developed by apple. I use another app, probably you are familiar with Skype. They allow me to talk to people and see them. And you can record the conversation and you can also search. You can bring people in front from different places and you can have a discussion. (Peter)*

Participants revealed, through their information practices, to have a sense of community and connectedness with people who have the same or similar interests and concerns. In the following instance, Michael said that he makes use of a specific mobile device application to study the Bible which he uses during meetings with people who study the Bible like him.

> *Gema: When do you use this app, the Bible app?*
> *Michael: Usually in a meeting. (Michael)*

Peter also stated that he accesses websites of colleagues, who are researching the same area of interest, and talk to them and follow them, using his iPad.

> *Often, I have got colleagues who live in Scotland, and they research. I go onto the website and I see what they are doing and sometimes I talk to them and follow up. (Peter).*

Participants use information as a way of keeping in touch, up-to-date or learning from information shared by others, within different communities. They take part in particular communities whose interests, needs and concerns are similar to theirs. Furthermore, they select the information to share according to the people, who take part in each community, where they are interacting and participating.

Thus, they share information related to professional and work tasks, just in academic or work groups. In this regard, older adults filter information according to the particular audiences they take part in. Participants revealed that they interact and participate in different social groups or communities and indicated they share particular content depending on people's interests and needs who take part in that specific group or community.

Ben, who works as a Christian Pastor, studies and shares knowledge about the Bible within an ecclesiastical community, where people have meetings every week to study the Bible using the Right Now media app:

> *My wife and I meet with other people every Monday night, and we study the Bible. We pray together. We have food together. We laugh. We have fun. We also do things together. But I can go on to Right Now Media and I can get some of the best speakers around the world, who are maybe doing a presentation. I can put it on the screen and the whole group can watch it. (Ben)*

However, he claimed that he wouldn't make use of Facebook to share information about his job.

> *I have never put anything on Facebook, not about I particularly want to put my job on Facebook. (Ben)*

Thus, information literacy experience is related to create, filter and share information and it is experienced within informal and formal communities throughout informal social practices such as conversations and ecclesiastical or academic discussions, where information emerges as a product of social relationships with others within different contexts. Through their social interaction, information is used as a tool to manage, strengthen and expand their relationships within different communities.

The possibility of participating in groups or communities allows older adults to expand their social relationships. This factor is important, considering the process of ageing. According to the report titled *Loneliness Among Older Adults: A National Survey of Older Adults Aged 45+,* loneliness is one of the biggest individual problems faced by older adults living alone (Wilson & Moulton 2010). Therefore, these communication apps, using mobile devices, help them to combat loneliness and keep them socially active, since these devices allow them to participate in today's society by sharing their opinions, comments and views through the use of communication apps and social networks. Michael said that he feels more sociable thanks to the use of his smartphone and tablet:

> *I mean, it probably helps me to be more a social person. I mean, it's easier to contact people. So, you can arrange to meet them, say them for a coffee. You can find out what other people are doing, and you can fit in with their plans. So, you can get out and see more people and do activities with more people. (Michael)*

Thus, interacting and participating in this study involves interpersonal relationships where older adults engage in social relationships, experiencing and projecting feelings, emotions and views, using their mobile devices. These interpersonal relationships help them to manage and strengthen relationships, and they make them feel that they take part in society in an active way, enabling them to stay in touch with the world around them. For instance, Sue revealed this feeling during her interview:

> *It just makes me feel part of the social life, of the world around you, you know, you stay in touch with the world around you. (Sue)*

Participants interact with other people using mobile devices through their information practices. They interact with others sharing information (e.g., photos, comments, views, events) through the use of communication apps such as FaceTime, Zoom and Skype, by email and also through social networks, mainly Facebook. One of the participants, Marc, who came to Australia in 2001, through his smartphone is able to not just keep up-to-date with the events that are happening in his country, but he can participate in the Persian radio. This allows him to interact with people from his native country and to participate of the latest events that they are happening in his country, sharing his opinions, views and ideas.

> *Sometimes I speak on the radio, Persian radio. This is the Persian radio. I switch on my phone and touch on radio and here it is. (Marc)*

Participants, in this case, experience information literacy as a way of managing and strengthening interpersonal relationships by interacting and participating, in different social contexts, using their mobile devices and apps through their experiences with information, where information about a common area of interest is the meeting point between participants who take part in a group or community.

The use of information occurs when they acquire information about the interests of a particular group or community, and they decide whether to join that group or community. Older adults, throughout their social interaction with others and participation within different groups or communities, use information to achieve a wide range of purposes such as to keep up-to-date, stay in touch with others, share opinions and views, or be informed about the events which are happening in the word around them. This information practice is active. There is an exchange of information with others. Participants share information with others and at the same time they acquire new information from others. Therefore, information literacy is related to creating, sharing and acquiring information.

5.4.6.4 Managing and strengthening relationships through engagement with information

As they manage and strengthen relationships using mobile devices, participants engage with information in a variety of ways.

They create information as a way of managing and strengthening their relationships. For example, Peter creates and shares documents with his students as part of his management of relationships with them:

> *I have five doctoral students myself and so I communicate with them through the tablet, by talking with one another about the progress. And yeah, one of the reasons why I got the iPad is to do that. I can create and share documents. So, I can talk and see my students now, we can work on the document together. (Peter)*

Older adults revealed that they share information to help others or keep their friends, family and workmates informed and updated, thereby managing and strengthening their relationships. Participants manage information including contact details, so that they are accessible when they need to communicate with others to manage their relationships with them. For some participants, their mobile devices are a memory aid because they allow them to store and retrieve contact details to enable them to communicate with them, thereby facilitating the management and strengthening of their relationships.

> *It's like a memory aid. I can't remember all those numbers. If I know the name, if they're friends, then I know their names. I can find them. (Michael)*

Through the management of their social relationships using mobile devices, participants get information from others, including personal or business information, keep up-to-date, and they learn and acquire new knowledge about something in order to satisfy their information needs. Thus, they find and discover information.

Information literacy would be experienced within individual practices, where information emerges as a product of their individual and personal desire or need to arrange a meeting for diverse purposes or keep in touch and up-to-date with others to manage their relationships. Information literacy would also be experienced within social practices such as conversations and discussions, where information emerges as a product of social relationships with others within different contexts (family, work, or community).

Information literacy experience, in this case, is active. On the one hand, older adults create and share new knowledge, views, personal experiences, personal and business announcements and data; and on the other hand, they receive information. In this sense, information literacy experience is rich as participants enrich themselves due to the exchange of information, which is part of establishing and strengthening their social relationships.

5.4.6.5 Using mobile devices to facilitate the management of relationships with others

All participants considered that mobile devices are very good, fast, helpful, convenient and cheap tools for keeping in touch with people, due to their properties: these tools allow them to be contactable and be in constant communication with others at any time and from anywhere, by playing an important role in establishing and maintaining social relationships despite distance.

5.4.6.5.1 Providing cheaper communication apps

Most participants stated that the low cost of communication using mobile devices is one of the most important factors in increasing their usage of the devices. For instance, Ray pointed out the low cost of communication as the second reason to make use of email using their mobile devices:

> *Gema: Why do you use this way of communication?*
> *Ray: Oh, well. Firstly, because it is very handy and secondly because the cost is almost for free, you know. And, it is the easiest way to be in touch with others. (Ray)*

Cost of communication is a particularly important consideration for older Australians because they may have a restricted incomes:

> *When you're getting older, you know, I say somebody who is a pensioner, they can't afford it but if they have this. And if the person who they're talking to has an iPad or and iPhone, you can talk to them and it costs nothing. (Anne)*

The low cost of communication through their mobile devices allowed participants to stay in contact and manage their relationships with others, mainly with relatives and friends who are far away.

> *For me to use my home phone, to ring my daughter it would be very costly. For me to use my home phone to ring my friends in Brisbane and Gold Coast would be very costly where my smartphone I have my plan each month and it costs me nothing more than $30 per each month. So, for me it is less costly and more effective. (Emma)*

> *For instance, if I have a relative, who is living in South America, and I need to communicate. I mean, in case of an urgent situation, if I couldn't have access to these items, to these devices, it would be harder and more expensive. (Ray)*

> *I had a friend that went to England in September. Now I called her on Messenger because she has an iPhone. It didn't cost me anything to talk to her. So, there are financial benefits as well. (Anne)*

The low cost of communication using mobile devices facilitates establishing and maintaining social relationships among older adults, as community, and the social relationships of older adults with relatives and friends.

Looking for the cheapest way of communicating with family and friends is an important information literacy experience for older Australians. Participants revealed their need to be in contact and be able to communicate with others at a low cost, and that they perceive mobile device apps allow them to meet that need. Information is obtained by following the advice from relatives, friends or work colleagues, who inform them of the existence of communication apps that allow them free communication with others. Learning to use these apps is part of their information literacy experience, as is the experience of using them to communicate and therefore manage their social relationships.

5.4.6.5.2 Overcoming distance

Older adults experience mobile information literacy as establishing and maintaining social relationships with others, despite distance, using mobile devices. Participants use their mobile devices to share information, communicate and stay in touch with family and friends who live far away, through apps such as FaceTime, Skype, Zoom, WhatsApp, Messenger or Imo, and also via email. Sharing information and communicating with family and friends through mobile devices allows older adults to feel close to others and keep informed about their lives. Therefore, the use of mobile devices enables older adults to manage their social relationships, particularly those who may not live close to them geographically.

> *I use email… Yeah. It's very easy on the tablet. Yeah, it's (laughter)… You can choose the photo you want. But I receive a lot more from the family because my son-in-law sends me lots of the children from Melbourne so that I've got those all the time because we don't see them often. So that keeps me up to date... For example, I got two this morning,*

> *one of their learning to ride a bike… A group of friends dancing. So yes, it's lovely... We don't miss out on so much by not living close. (Claire)*

Further, they don't have to drive or move in order to see and talk to their relatives and friends, thanks to the mobile devices' properties. This aspect is really helpful for older adults, particularly for older adults with disabilities or who live in isolated areas. For instance, Sue mentioned that she was interested at having a consultation online with a Doctor because she lives far away from them.

> *We are in a very rural area, all is countryside… But I saw on the television the other day and I am thinking of ringing them for doctors and patients' consultation on line… Specially (sic) if patients live far around or in the country. It is not easy to get a Doctor, if you really have a long way out, and it would be very helpful if you can just go through and get a consultation. (Sue)*

5.4.6.6 Choosing the best apps for communicating

Participants make use of a wide range of mobile device-based communication apps for managing their social relationships, such as Skype, FaceTime, Zoom, WhatsApp, Imo, email, SMS or FaceTime. These allow older adults to interact with each other through conversations, exchanging information about their lives with relatives and friends, and participating in discussions where they exchange information with people who are working in the same area of interest. They select the best mobile communication app based on the preferred means of communication of those with whom they are communicating, the social context in which the communication takes place (work, family or within a community), and the type of information they want to communicate. The most important aspect considered by older adults in the communication process is that the information is received and understood correctly, thus achieving an accurate and successful management of their social relationships.

Participants revealed that they make use of these communication apps for managing their relationships with others, in different social contexts: family, workplace or within a community. The following quotation shows how Ray, who works as pastor, uses these communication apps in different social contexts. Ray shared that he uses

WhatsApp and Skype, not just in his work context, but also for personal communication with people from other social contexts:

> *Well, for personal and for business relations, in business relations. For example, this one that I have, that I talk to [indicates contact on his smartphone] she is a person who is involved with us in the Ministry in South America so, most of times, we communicate with each other through WhatsApp and other times by Skype. (Ray)*

Similarly, Claire said that she makes use of these communication apps for managing her relationships with relatives: "I use FaceTime or Messenger to talk to my children and my grandchildren." (Claire); and Peter revealed that he makes use of them for communicating in an academic community: "it is mainly used to communicate with colleagues through the email." (Peter)

Participants' social context plays a significant role in the adoption and use of communications apps. Relatives, friends and workmates exert an influence in different social contexts by advising and informing older adults about the benefits of using these apps for communicating with each other. Peter revealed how his daughter was the person who showed him and taught him to use Skype:

> *My daughter is living in Canberra, which is very far. And my daughter said to me: you can talk to one another. And she showed me and introduced me into Skype. (Peter)*

Most participants claimed that they know some of these communication apps thanks to friends, relatives or workmates, who inform them about these tools and provide advice to help them learn and start using the apps. In this sense, people who take part of their social context are a crucial source of information. Marc said in his interview:

> *My friends told me that WhatsApp is good, and I can call free to another country or I can use also Imo. (Marc)*

In selecting an app to use to communicate with someone, participants are mindful of the recipients' preferred means of communicating. For instance, Ray said in his interview that he makes use of communication apps which are used by the message recipients.

It just depends, it just depends if people are used to being involved with that application or they use them. Some of them have a number of them but they don't use them. They don't use them so, I use whatever is available for them. (Ray)

Another factor that influences the choice of an app is the nature of the content. Claire revealed that she selects the communications app according to the character of the message content:

Depending on what the message is and what you want to convey if it's more factual it doesn't really matter. (Claire)

5.4.6.7 Preference for talking

I think that our generation loves talking one on one or on the phone. (Emma)

Most participants in this study prefer to manage their social relationships through the synchronous communication of talking. There are several reasons for this. They find tools like email to be impersonal (Emma). Text based communication can also be difficult because there is often a time lag, which impedes the natural flow of conversation.

When it started, this technology, the only way that I could do it was usually through the use of text. I actually typed, and you had a discussion, or you had a forum, or you had a chat room and you did all that. That's very difficult because, you know, you can't talk naturally when you try to send the question and goes to them, they can look it at and read it, but they don't know the answer and you don't know… So, there are big gaps in a conversation, you know, the stops. (Peter)

I prefer talking to someone because you're getting a response. (Michael)

A preference for synchronous, talk-based communication to manage their social relationships is likely to be partially a product of the participants' socio-cultural

environment, in which their lives have been enacted to a large extent without the existence of communication tools like mobile devices.

> *Gema: What do you prefer, do you prefer communicating with each other by email or face-to-face?*
> *Marc: I like to see my friends face-to-face. (Marc)*

Further, older adults in this study revealed that they prefer using communication tools where they get an immediate response and they don't have to wait.
Thus, older adults make use of mobile communication apps such as FaceTime or Skype, which allow them to manage their social relationships with other people by talking in a synchronous way.

For older adults who may live at a distance from their family, synchronous talk-based communication is a means by which they perform their role as parents and grandparents through their information literacy experiences. In particular, the addition of video allows them to engage with members of the family who might not be able to converse with them:

> *I think [FaceTime is] easier with the children. They can show you things. It's much more real. And particularly, one's only five-months-old, so we can see what she's doing. Where we can't talk to her on the phone. The four-year-old, we can now, but the baby, you can't. (Claire)*

5.4.6.8 Summary

Mobile devices facilitate the management of relationships with others thanks to their properties, characteristics and the wide range of communication apps that these devices provide. The data showed that older adults in this study used mobile devices to keep in touch, up-to-date, meet and bring people together with the purpose of satisfying their individual need of establishing and strengthening their social relationships in different contexts, by making use of mobile device-based communication apps and Facebook mainly. Thus, this category takes place throughout the process of communication with others.

In addition, in this category, older adults revealed that they learn and make use of these new mobile device-based communication apps by following advice from friends and relatives mainly, and they decide to apply this information in order to manage their social relationships.

In '*Managing relationships'* information literacy would be experienced through the following practices of information: analysing, becoming better informed, creating, finding, managing, sharing and using information.

5.5 Relationships between categories

In the previous section I have presented the six categories of older adults' information literacy experience using mobile devices. In this section I discuss the existing relationships between these categories.

I decided to take the approach adopted by Davis (2015) in her research study in order to define the relationships between the categories of my study. The work by Davis (2015) explores the information experience of new mothers in social media applying Constructivist Grounded Theory as methodological framework. Both research studies explore phenomena that are experienced by particular groups of the population. These studies are also comprised of complex and nuanced categories. In addition, both of them adopt Constructivist Grounded Theory methodology to explore their phenomena of study. These similarities between both studies provide insights that made me consider that the approach adopted by Davis is the most appropriate to explain and describe the relationships between the categories of this study.

Thus, I have used the same descriptors used by Davis (2015) to describe the types of relationships between categories since they coincide with the type of relationships between categories of this study.

The categories of this study are interconnected in diverse ways. One category provides a foundation for all other categories, another category exerts influence on the rest of the categories, some occur through experiences of other categories, some facilitate experiences in other categories, some overlap with other categories, and

some hinder experiences in other categories. Therefore, the relationships between categories are multiple and complex.

Charmaz (2014, p.218) acknowledges the importance of using a diagram as 'a visual representation of categories and their relationship'. However, due to the complexity of the phenomenon of study which produces these different and complex relationships between categories, I decided to follow the approach by Davis (2015), creating a table where the relationships between categories would be better represented visually than using a diagram.

Thus, in the Table 5.2 I show an overview of relationships between the categories, and provide a short description of each category and the type of relationships it has with the rest of the categories.

The category *Ageing* impacts the rest of categories since the changes produced by the ageing process are present and exert an influence on all actions in their everyday lives. Therefore, the experiences of all categories occur through *Ageing*. For instance, *Being entertained* may occur through *Ageing* because older adults play games using mobile devices, not just as a way of *Being entertained* but also as a way of training their mind, thus avoiding mental diseases related to the ageing process. Also, all other categories may be hindered by the category *Ageing,* due to the changes and diseases related to the process of ageing such as cognitive, mobility and sight issues. These changes may hinder the experiences of the rest of the categories. For instance, if they have memory issues they will have difficulty remembering instructions to be able to manage their relationships, to enact tasks of their everyday lives, to learn, or simply to be entertained using their mobile devices.

The category *Learning to use and manage mobile devices* is the foundation for all other categories. This category enables the experiences of the rest of categories to occur. Thus, it facilitates experiences in all other categories. For instance, *Learning to use and manage mobile devices* facilitates *Being entertained*, *Enacting everyday life*, and *Learning* and *Managing relationships* because the experiences of learning to use their mobile devices make older adults able to integrate the use of mobile devices in order to be entertained and pass the time, enact their everyday tasks, learn and help

them to stablish and keep social relationships with others using their mobile devices. At the same time, it hinders the experiences of these categories because older adults in this study revealed that they experience a lack of digital literacy skills, which impacts their adoption and way of using mobile devices to be entertained, enact their everyday life, learn and manage their relationships. In addition, *Learning to use and manage mobile devices* may be hindered by *Ageing*, because some diseases related to the process of ageing such as sight issues make it difficult for older adults to learn and manage the use of their mobile devices, due to the small size of mobile devices' screens.

CATEGORY	SHORT DESCRIPTION	RELATIONSHIPS TO OTHER CATEGORIES
Category 1. Ageing	Older adults experience information literacy as a way of helping them to overcome their needs, concerns and health diseases related to their ageing process through their engagement with information.	The process of ageing is present and exerts an influence over all categories.
Category 2. Learning to use and manage mobile devices	Information literacy is experienced as *Learning to use and manage mobile devices* by interacting with information effectively. Participants engage with information through the learning and management of their mobile devices.	*Learning to use and manage mobile devices* is the foundation category which, simultaneously, underpins and hinders all other categories. Occurs through: • *Ageing* • *Being entertained* • *Enacting everyday life* • *Learning* • *Managing relationships* Facilitates: • *Ageing* • *Being entertained* • *Enacting everyday life* • *Learning* • *Managing relationships* Hinders: • *Being entertained* • *Enacting everyday life* • *Learning* • *Managing relationships* May be hindered by: • *Ageing*

CATEGORY	SHORT DESCRIPTION	RELATIONSHIPS TO OTHER CATEGORIES
Category 3. Being entertained	Older adults experience information literacy when they access, understand and use their mobile devices and apps. as a way of *Being entertained*.	Occurs through: • *Ageing* Overlaps with: • *Enacting everyday life* May be hindered by: • *Ageing* • *Learning to use and manage mobile devices*
Category 4. Enacting everyday life	Information literacy is experienced during the execution of tasks and problem resolution in their everyday lives. Participants engage with information through the enactment of their daily tasks.	Occurs through: • *Ageing* Facilitates: • *Ageing* Overlaps with: • Being entertained • Managing relationships • Learning May be hindered by: • *Ageing* • *Learning to use and manage mobile device*

CATEGORY	SHORT DESCRIPTION	RELATIONSHIPS TO OTHER CATEGORIES
Category 5. Learning	Older adults' information literacy experience emerges when they learn and acquire new knowledge through their information practices using mobile devices.	Occurs through: • *Ageing* • *Managing relationships* Facilitates: • *Ageing* • *Enacting everyday life* Overlaps with: • *Enacting everyday life* • *Learning to use and manage mobile devices* May be hindered by: • *Ageing* • *Learning to use and manage mobile devices*
Category 6. Managing relationships	Older adults experience information literacy when they create, find, filter, share and exchange information to manage and strengthen their interpersonal relationships using mobile devices.	Occurs through: • *Ageing* Overlaps with: • *Enacting everyday life* Facilitates: • *Ageing* • *Learning* • *Learning to use and manage mobile devices* May be hindered by: • *Ageing* • *Learning to use and manage mobile devices*

Table 5.2 Mapping the categories of Older Australians' Mobile Information Literacy: A Grounded Theory.

Some of the categories of experience overlap with other categories. For instance, *Being entertained*, *Managing relationships* and *Learning* overlap with *Enacting everyday life* because each experience of information literacy related to being entertained, managing and strengthening their relationships, and learning are part of the enactment of their daily lives.

Finally, some categories occur through experiences in other categories. For instance, sometimes *Learning* happens through *Managing relationships*, since older adults in this study revealed that they learn from the exchange of information with others while they manage their social relationships.

5.6 Conclusion

In this chapter I have presented the findings from the analysis of the data from 12 interviews. These findings include a clear description of older adults' information literacy experience using mobile devices through the presentation of a new theory labelled Older Australians' Mobile Information Literacy: A Grounded Theory, and the definition and discussion of its six categories. I have also described the foundation concepts of the phenomenon of this study and the six categories that comprise the substantive Grounded Theory. Finally, I have presented the relationships between categories. In the next chapter, I discuss these findings, the limitations of the study, its contributions to disciplinary knowledge and practice, and I make suggestions for future research.

6 Discussion and conclusion

6.1 Introduction

In this chapter I discuss the contributions this study provides to existing theory and research. Firstly, I provide an overview of the study's main findings. In the next section I present what the outcomes of this study contribute to information literacy research, to library and information science practice and to mobile devices research. Next, I provide a discussion of the limitations of the research. Finally, I suggest several future research directions and offer some concluding remarks about the research.

6.2 Research overview

The aim of this study was to research how older adults experience information literacy using mobile devices and it has addressed the following main research question: *How do older adults experience information literacy using mobile devices?*

Emanating from this research question, the two main objectives were identified as:

- To contribute new knowledge with a new theoretical understanding about how older adults experience information literacy using mobile devices.
- To explore, grounded in this new knowledge, what it may provide to information literacy education and consumer information research using mobile devices, supporting the information needs of older adults.

Using Constructivist Grounded Theory method, the outcome of this study is a substantive Grounded Theory named Older Australians' Mobile Information Literacy: A Grounded Theory. This theory contains six categories of older adults' information literacy experience using mobile devices in a holistic sense.

These six categories and their aspects are:

- *Category 1. Ageing.* In this category information literacy is experienced through the use of mobile devices to overcome older adults' needs, concerns and health diseases during the ageing process, through their engagement with

information. *Ageing* involves: managing and improving age related conditions, including related health conditions; the advantages and disadvantages of mobile as opposed to other devices for ageing users; staying mentally active including avoiding dementia; actively participating in society; keeping up with younger generations; and generational differences. This category impacts all other categories.

- *Category 2. Learning to use and manage mobile devices.* In this category information literacy is experienced as interacting with information with the aim of learning how to use and manage mobile devices. *Learning to use and manage mobile devices* is divided in three parts: Learning to use mobile devices, that contains: independent learning and exploration, getting help from others, experiencing a lack of digital literacy skills, and helping others to learn; Managing the use of mobile devices, that contains: usability and choosing how and when to use mobile; and Affective dimension, that contains: positive and negative feelings about learning to use/managing mobile devices. In addition, this category involves: being introduced to mobile devices and discovering apps; this category is the foundation category which simultaneously underpins and hinders all other categories in the theory.
- *Category 3. Being entertained.* In this category information literacy is experienced through the discovery, learning, access, understanding and use of mobile devices apps, as a way of *Being entertained* through their information experiences. *Being entertained* involves: playing games; reading; listening to music; and watching videos and movies.
- *Category 4. Enacting everyday life.* In this category information literacy is experienced by older adults throughout the execution of tasks and issue resolution in their daily lives using mobile devices. *Enacting everyday life* involves: mobile devices are integral to everyday life; completing the tasks of everyday life; improving everyday life; and using mobile devices for work.
- *Category 5. Learning.* In this category information literacy is experienced throughout the learning and acquisition of knowledge using mobile devices. *Learning* involves: desire to learn and its benefits; use of mobile for learning and its impact; and what they learn and how they do it.

- *Category 6. Managing relationships.* In this category information literacy is experienced throughout the management and strengthening of interpersonal relationships using mainly mobile device-based communication apps. *Managing relationships* involves: engaging with family and friends; participating in groups or communities; managing and strengthening relationships through engagement with information; using mobile devices to facilitate the management of relationships with others; choosing the best apps for communicating; and preference for talking.

These six categories and their aspects show how older adults' information literacy experiences through their engagement with information using mobile devices help them to age actively. Older adults are able to entertain, learn, enact their personal and professional lives and manage their social and business relationships by themselves, through diverse information practices using mobile devices. In addition, these categories reveal that the degree of older adults' information literacy exerts a significant impact on the level, and way of use and adoption of mobile devices.

Further, the study's findings have provided knowledge that enhances our understanding about what older adults may experience as information, and that it is used to accomplish different purposes throughout the enactment of their everyday lives in different social contexts. Older adults' information literacy experiences using mobile devices are individual, social and completely integrated into their everyday lives.

6.3 How does this study contribute to an understanding of older adults' information literacy experience using mobile devices?

In this section, I describe how this study contributes to existing knowledge and how it is positioned in relation to the existing literature. I compare the existing work with the main findings of this study and how they contribute to an understanding of older adults' information literacy experience using mobile devices.

According to the principles of Constructivist Grounded Theory (Charmaz 2006, p. 166), I completed a preliminary literature review before my confirmation of candidature, which aimed to confirm that information literacy is an appropriate phenomenon to study within the context of older adults and mobile devices. It also allowed developing initial theoretical understandings of this phenomenon. In addition, this initial literature review revealed the gap of older adults information literacy and mobile devices research, acknowledging the need for further research. I abandoned the review of existing research and did not return to it until my data analysis was completed and my Grounded Theory developed, avoiding preconceived ideas which could influence the outcome.

A number of research studies related to the topic of older adults and mobile devices have been published in the two years since I undertook the initial literature review. Most of these studies explored the use and adoption of mobile devices by older adults (Enwald et al. 2016; Navabi, Ghaffari & Jannat-Alipoor 2016; Khawaji 2017). Studies by Enwald et al. (2016) and Navabi, Ghaffari and Jannat-Alipoor (2016) revealed that most older adults have negative opinions and unfavourable attitudes relating to the use of tablets or smartphones. Also, both studies pointed out that older adults are slower in adapting to and accepting these technologies, due to limitations and changes caused by the process of aging. A study by Khawaji (2017) revealed that older adults experience difficulties in the use of smartphones and stated that these difficulties are caused mainly by the design of these devices. The findings of these studies concur with aspects of *Category 1. Ageing* and also with aspects of *Category 2. Learning to use and manage mobile devices* of this study. However, to date there is no research focused on exploring older adults' information literacy experience using mobile devices. Thus, the current study contributes to closing that gap.

Although, to date, there is no theory on how older adults experience information literacy using mobile devices, some of the categories and their aspects of my Grounded Theory have been explored in existing research and their findings coincide with the results of this study. In the following sections, I position my Grounded Theory by discussing each category in turn, exploring its contribution to knowledge

by describing and comparing the similarities and differences between my findings and the relevant literature about the phenomenon.

Category 1. Ageing affects all other categories and reveals that changes experienced over the ageing process impact older adults' experience of information literacy using mobile devices. This category confirms that cognitive changes and states produced by the ageing process are linked to and impact older adults' information literacy experience. When their cognitive abilities decline, such as brain-based skills, attention, memory and other skills, it makes it difficult for them to interact with information to learn, to be entertained, to perform many tasks of their everyday lives, to manage relationships and to learn to use their mobile devices. Walton and Hepworth (2011) examined the cognitive aspects of information literacy. However, this study focuses on undergraduate students' cognitive states and information literacy capabilities during an information literacy teaching intervention, they do not explore how the cognitive changes impact on older adults' information literacy experience.

In addition, this category acknowledges some aspects that had already been investigated in previous studies, such as: the impact of ageing on access to technology (Czaja & Lee 2007); the role of mobile devices in helping older adults to improve their quality of life (Plaza et al. 2011); the use of information and communication technologies (ICT), including mobile devices, as tools for avoiding mental diseases related to the ageing process (Maresova & Klimova 2015); the use of digital technologies, including mobile devices, to satisfy the need of older adults to sustain active participation in society (Hill, Betts & Gardner 2015); the existence of generational differences in terms of their preferences, use and adoption of mobile devices (Magsamen-Conrad et al. 2015); and the desire of older adults to keep up with younger generations (Aguilar, Boerema & Harrison 2010). Although the research focus of these studies is not the same as the focus of my research, these studies explore relevant aspects and changes related to the ageing process, which impact older adults' experience of information literacy through the adoption and use of new technologies, including smartphones and tablets.

Some aspects in *Category 2. Learning to use and manage mobile devices* concur with findings of existing literature by Leung et al. (2012) and Tsai, Shillair and Cotten (2014). These studies revealed older adults learn to use their mobile devices by themselves and by receiving help from others particularly from relatives and friends. These results concur with 'Independent learning and exploration' and 'Getting help from others' which are aspects in *Learning to use and manage mobile devices*. In addition, the studies by Leung et al. (2012) and Tsau, Shillair and Cotten (2014) pointed out challenges in learning to use mobile devices for older adults, which align with 'Experiencing a lack of digital literacy skills', another aspect of this category. Likewise, the study by Kurniawan (2007) reveals that older adults experience usage patterns and problems that concur with the findings included in 'Usability' and 'Choosing how and when to use mobile', aspects of *Learning to use and manage mobile devices*. Furthermore, the key findings of the report titled *Understanding Digital Behaviours of Older Australians* (Australian Government, Office of the eSafety Commissioner 2018), whose main objectives were to understand the current behaviour, perceptions and barriers towards digital technology of the population aged 50 years and over, revealed that there is a relationship between the level of digital literacy and attitudes, perceptions and level of use of digital devices. This finding concurs with aspects of *Category 2. Learning to use and manage mobile devices* such as 'Negative feelings about learning to use/managing mobile' and 'Experiencing a lack of digital literacy skills'.

Similarly, diverse studies mention the use of mobile devices by older adults for entertainment (Enwald et al. 2016; Choudrie et al. 2014; Cota, Ishitani & Vieira 2015), revealed throughout different aspects of *Category 3. Being entertained* of this study. However, these studies just make reference to being entertained as one of the uses of mobile devices by older adults, without exploring in depth how older adults are entertained using mobile devices or exploring how older adults experience information literacy when they make use of their mobile devices for entertainment.

Likewise, results of prior studies by Rosales and Fernandez-Ardèvol (2016), Choudrie et al. (2014) and Smith (2014) provide evidence that older adults use their mobile devices to develop daily tasks, including work tasks according to the research

findings by Kurniawan (2007). These findings concur with some aspects of *Category 4. Enacting everyday life* which reveal the use of mobile devices to complete tasks of everyday life and the use of mobile devices for work. Similarly, Acharya (2015) affirms that information and communication technologies (ICTs) including mobile devices have become an integral tool of older adults to learn, access health information, and do banking and shopping online. This fact concurs with 'Mobile devices are integral to everyday life' and 'Completing the tasks of everyday life', aspects of *Enacting everyday life*.

Category 5. Learning in my research entails: desire to learn and its benefits; use of mobile for learning and its impact; and what they learn and how they do it. The little existing literature available on learning just mentions the importance and interest in learning for older adults, or the benefits and challenges for older adults when they learn using mobile devices due to the physical characteristics and properties of these devices, such as the work by Githens (2007).

Category 6. Managing relationships concurs with research findings of various studies such as the work of Phillipson et al. (2001) that confirms the significance of communication media such as smartphones for improving and strengthening relationships, particularly with family and friends who live far away. Also, the study by Cameron, Marquis and Webster (2001) points to social interaction as one of the reasons to use emerging technologies, including mobile devices, by older adults. In addition, the results of the study by Delello and McWhorter (2015) confirm that older adults make use of iPads to make connections with others, particularly with family members. This finding supports the 'Engaging with family and friends' aspect of *Managing relationships*. Likewise, the results of Winstead et al. (2013) revealed the potential of iPads to allow older adults to connect to online communities, renew prior relationships and improve communication with their relatives. This fact supports not just 'Engaging with family and friends' but also 'Using mobile devices facilitate the management of relationships with others' and 'Participating in groups or communities', aspects of *Category 6. Managing relationships*. The work by Martínez-Rolan and Piñero-Otero (2015) examines the mobile device-based communication apps used by older adults for managing their relationships, such as Skype, WhatsApp and Line. This study confirms the key role of these apps for

interpersonal communication and social interaction for older adults. This aspect aligns with 'Choosing the best apps for communicating' in *Managing relationships*. Similarly, the findings obtained in the report titled *Understanding Digital Behabiours of Older Australians* (Australian Government, Office of the eSafety Commissioner 2018) revealed that older adults use their mobile phones as security or emergency devices, since these devices allow them to contact their loved ones in case something goes wrong, or to update them on their status. These findings concur with the aspect 'Feeling connected, safe and secure' in *Managing relationships*.

Also, the use of social networks by older adults is examined in various studies. For instance, the work by Erickson (2011) reveals the importance of using online social networks, such as Facebook, by older adults to maintain existing relationships and establish new relationships with others. In addition, the works by Vosner et al. (2015) and by Smith (2014) reveal that Facebook is the social network most frequently used by older adults. This fact concurs with one of the aspects in *Category 6. Managing relationships*: 'Engaging with family and friends', in which older adults stated that they use Facebook as a tool for handling family and social relationships.

However, there are categories and aspects of my substantive Grounded Theory that have been little examined, or they have not been explored by the existing literature. Firstly, my research provides an in-depth discussion on how ageing impacts older adults' information literacy experience using mobile devices. It explores the concerns and needs of older adults through their ageing process and how these needs are satisfied through their information literacy experience using mobile devices. Existing studies, such as the works by Asla, Williamson and Mills (2006) and Asla and Williamson (2009; 2013), explore the role and use of information by older adults relating to successful aging. Their findings confirm that information literacy is crucial to the well-being of older adults, but they do not examine how older adults experience information literacy using mobile devices. My study provides empirical evidence of aspects of ageing: managing and improving age related conditions, including related health conditions; advantages and disadvantages of mobile as opposed to other devices for ageing users; staying mentally active, including avoiding dementia; actively participating in society; keeping up with younger

generations; and generational differences. The existing studies have only discussed these aspects by focussing on the role and use of mobile devices throughout the ageing process, but they have not examined the information literacy experience within the ageing process, they do not explore how information literacy is experienced in the ageing process using mobile devices.

Learning to use and manage mobile devices is the category mostly explored in the existing literature. However, it revealed some aspects that have been little discussed in the previous literature: helping others to learn; and choosing how and when to use mobile devices. In addition, how information literacy is experienced while they are learning to use and manage mobile devices is not investigated in the existing literature.

Being entertained in my research explored how older adults experience information literacy while they use their mobile devices for entertainment. The use of mobile devices by older adults for entertainment and leisure is explored in the existing literature. However, these studies do not consider the concept of information literacy in their research. *Being entertained* in my theory reveals the following aspects: playing games; reading; listening to music; and watching videos and movies, which are not examined in depth in the existing literature. They are mentioned as different ways of *Being entertained* using mobile devices, but they are not explored as older adults' experiences of information, which constitute their information literacy experience while they use mobile devices.

Although existing literature has discussed and confirmed aspects in *Enacting everyday life*, these studies do not examine in depth the daily tasks completed by older adults using mobile devices nor their interactions with information to execute those tasks. *Enacting everyday life* entails everyday tasks such as communicating with others, banking, shopping, travel planning, seeking information to help with health conditions, solving problems and learning. The most explored task in the existing literature is the search of health information, which is examined in several studies such as the work by Yates et al. (2012), and the research by Goodall, Newman and Ward (2014). In addition, some works explore the concept of health information literacy such as the work by Mackert et al. (2016), the research by Yates

(2013) and the study by Yates, Partridge and Bruce (2009). However, these studies do not explore the phenomenon in the context of mobile devices.

The little existing literature available on learning do not explore nor provide a discussion related to how and what older adults learn using mobile devices, and they do not investigate how they experience information literacy while they learn using mobile devices. The studies that research how people learn making use of mobile devices and explore information literacy, use the term m-learning to designate the learning using mobile devices and they focus on younger adults. Examples are the work by Brown (2005) and the study by Melhuish and Falloon (2010).

Managing relationships in my research provides an in-depth discussion of how mobile devices facilitate the management of social relationships with others and entails the following aspects: engaging with family and friends; participating in groups or communities; managing and strengthening relationships through engagement with information; using mobile devices facilitate the management of relationships with others; choosing the best apps for communicating; and preference for talking. Although several aspects of this category are explored in previous literature, other aspects are little examined such as 'Choosing the best apps for communicating' and 'Preference for talking'. Previous studies (Plaza et al. 2011; Fondevila et al. 2015) provide information about the most popular communication apps for older adults, but they do not discuss in-depth why, how and when older adults decide which of these communication apps to use. In addition, there is no previous research which has explored the role of information and the interactions with information experienced by older adults to manage relationships using mobile devices.

The categories reveal how older adults experience information literacy through their individual and social information practices. Some of these information practices, such as analysing, finding, sharing and using information, coincide with the categories that Bruce (1997b) identified to describe how information literacy is seen, experienced and understood by people. Although Bruce identified and described seven ways information is experienced to learn, her work did not take a broader

focus on other ways that information is experienced, like using information for entertainment. My study takes this broader focus, as indicated by my participants' experience, where information literacy is about more than using information to learn. Thus, this study contributes to information literacy research by identifying new ways information literacy is experienced by this specific group, such as being overwhelmed by information, becoming better informed and perceiving the importance of being informed.

In short, my research makes a significant contribution to the information literacy field and mobile devices research, related to the specific group of population formed by older adults.

This study provides an original theory that explores older adults' information literacy experience using mobile devices with participants who use mobile devices in everyday life. It is grounded in the data and provides a full picture of the complex and rich older adults' information literacy experience using mobile devices.

6.4 How does study contribute to information literacy research?

To date, there have been few research studies in which information literacy is explored from a socio-cultural perspective and most of these studies were conducted in the educational (Lundh & Limberg 2008; Sundin, Limberg & Lundh 2008; Wang 2010) and workplace contexts (Lloyd-Zantiotis 2005; Lloyd 2007a, 2007b; Veinot 2007). Vygotsky, one of the theoreticians of socio-cultural theory, states that socio-cultural theories define learning and development as 'being embedded within social events and occurring as a child interacts within people, objects, and events in the environment' (Vygotsky 1986, p. 287). Thus, from a socio-cultural perspective, information literacy is examined focussing on information practices and activities in a particular context and community, where people learn as a result of social activities and interaction with others. This study contributes to the area of research that explores the phenomenon of information literacy from a socio-cultural perspective. It provides a greater understanding of how older adults experience information literacy within their socio-cultural environment. This study provides evidence of how the

socio-cultural context exerts a significant influence not just on older adults' information literacy experience through their information practices, but also on the way of making use of their mobile devices. The findings from this study reveal that older adults experience information literacy not just within individual practices where information emerges as a product of their individual interactions with their mobile device as a tool to engage with information; but also, within social practices where information emerges as a product of their social relationships with others within different contexts. One of the aspects in *Category 6. Managing relationships*, 'Preference for talking', is a clear example of how the socio-cultural environment, in which older adults' lives have been enacted in large part without the existence of communication tools like mobile devices leads them to prefer the use of mobile communication apps which facilitate synchronous communication by talking such as Skype or FaceTime.

In addition, there are few research studies in which information literacy is explored in community contexts (Partridge, Bruce & Tilley 2008; Yates et al. 2012; Yates 2013). These works acknowledge the importance of researching this area in order to provide a greater understanding of the phenomenon. Yates et al. (2012) identified seven qualitatively different ways Australians aged 65 years and older use information to learn about their health, and two previous Australian studies using qualitative approaches, the work by Asla and Williamson (2009) and the research study by Asla, Williamson and Mills (2006) explored how older Australians (60 years and older) used information as part of their everyday lives. These studies revealed that information literacy is an important concept for older adults and that more work exploring the phenomenon was needed.

Thus, the findings of this study can be considered to strengthen and enrich the information literacy research beyond library, educational or workplace contexts. Further, the findings reveal the need to consider the context where the phenomenon takes place in order to obtain knowledge of a contextual nature of information literacy and how it manifests itself with respect to the context where it happens. Based upon the findings of this study, I suggest that it is crucial to consider and analyse the context to discover the core of information literacy and its complexities.

Further, the results of this study reveal that older adults' information literacy experience in everyday life is a reflection of their social and physical characteristics. In the course of their everyday lives, older adults experience information literacy by interacting with information using mobile devices in a variety of ways. This helps to understand them as a community and uncover their needs, concerns, interests, difficulties and matters of personal relevance, which are influenced by their physical and personal characteristics, and also by the socio-cultural context where their lives take place. The outcomes of this study showed older adults' information literacy experiences using mobile devices facilitate and enable them to age, to be entertained, to enact their everyday lives, to learn and to manage relationships. Collectively, these information literacy experiences portray older adults' experiences lived as a community.

In summary, this study contributes to the expansion of information literacy research from a socio-cultural perspective in a community context, with new knowledge and understanding about how older adults experience information literacy and how their information literacy experiences are socially and culturally influenced by their interactions within the community.

6.5 How does study contribute to mobile devices research?

The outcomes from this study reveal that mobile devices, such as smartphones and tablets, offer benefits that are especially valuable to older adults, helping them remain more independent, participate in the information society and maintain their quality of life. However, there is a lack of research that addresses older adults and their interests with regard to ICT technologies such as smartphone applications (apps), and their specific needs and demands regarding these new digital technologies and tools. There has been little research dedicated to the analysis of the use of apps by this group of population in their everyday lives.

The findings provide significant examples of the concerns and difficulties using mobile devices experienced by older adults. For instance, in *Category 2. Learning to*

use and manage mobile devices, older adults revealed that they experience a lack of digital literacy skills and difficulties making use of basic functions of their mobile devices. In addition, this category provides relevant information about how and when they use their mobile devices. These findings can be used by professionals and designers of mobile devices in creating and designing apps and services which facilitate older adults in the learning, adoption and use of these devices in their everyday lives.

6.6 How might these outcomes contribute to library and information science practice?

The findings from this study have significant implications for library and information science practice and mobile devices. This study can be used to inform the development and delivery of information services and products aimed at supporting the information needs of older adults in library and information services. The outcomes of this study can inform library and information science professionals in creating and refining the way they deliver services to older adults. The findings provide examples of the effective use of mobile devices in learning and reading. For instance, in *Category 5. Learning* older adults show their interest in learning, in how and in what they learn using their mobile devices. Also, in *Category 3. Being entertained* older adults revealed that they make use of mobile devices to read books for entertainment. Thus, library and information science professionals can create, refine and deliver products and services according to the needs of older adults, enhancing their accessibility from mobile devices.

6.7 How does the study contribute to information literacy community education?

The findings from this study provide knowledge that is of relevance to information literacy community education. They reveal that older adults experience information literacy using information to learn in a variety of ways using their mobile devices. *Category 5. Learning* provides descriptions of what participants learn, how they learn and the way in which learning happens using mobile devices. In addition,

Category 2. Learning to use and manage mobile devices reveals significant information about older adults' experience of information literacy when using information to learn how to use and manage their mobile devices. These findings can be used by educators, helping them to guide the development of information literacy education services and products in the context of mobile devices, to support the information literacy needs of older adults.

6.8 Limitations of the research

This research is limited geographically. Specifically, this study focuses on exploring how older adults aged 65 years and over, who live in a regional town in Queensland, Australia, use and engage with information using mobile devices. Hence, the results may not be applicable outside the Australian regional context. Older adults with different characteristics, including socioeconomic status, age, race, education and geographical place of abode, could have a different information literacy experience using mobile devices to the research participants. The intent of this study was not to generalise on transfer findings beyond the original group, but rather to provide an exhaustive description of the phenomenon: How older adults in the context of this study experience information literacy using mobile devices.

The sample size for this research is an identified limitation. This study uses purposive sampling, in keeping with the sampling approach in Constructivist Grounded Theory. Thus, it investigates a small group of older adults. It is narrow in scope as it focusses on older adults' experience of their use and engagement with information through using mobile devices in their everyday lives. The selection of participants was focused for an in depth examination of the experience of the participants, not to be representative of the user population.

However, despite limitations concerning the geographical area and the sample size, the findings provide significant and useful understanding of how information literacy is experienced by older adults through the use of mobile devices, a topic which, to date, has received little attention by the research community.

6.9 Future directions

The findings of this study suggest several directions for future research. These future directions would extend our understanding of older adults' information literacy experience using mobile devices. Also, these recommendations would explore areas of significant relevance. In this section I describe future directions for research that have emerged from this current study.

6.9.1 Building on the current findings

This research has explored the information literacy experience using mobile devices among persons aged 65 years and over. Future research studies could provide more findings by examining how the phenomenon is experienced by other age groups. This would enable an exploration and analysis of the similarities and differences between diverse age groups. In addition, these future studies of how the phenomenon is experienced by other age cohorts would provide insight into whether the current study's findings are generalisable to other age groups.

The findings of this study, the categories and aspects which have been discussed in the existing literature, have not explored the concept of information literacy as phenomenon of study in the context of mobile devices. Hence future research could further investigate the current categories and aspects by furthering the exploration of information literacy with mobile devices. This would allow a deeper understanding of each category and aspect, and as result a better understanding of the phenomenon.

In summary, due to the lack of research on the phenomenon of this study, further research on all categories would be useful and necessary to confirm and extend the findings of this study.

6.9.2 Information literacy using mobile devices as a social practice

This study has explored how older adults experience information literacy through their information practices using mobile devices in their everyday lives. The findings of this research have revealed that the phenomenon of older adults' information

literacy using mobile devices is an individual as well as a social practice. Future research studies could build on these findings by extending this study to examine how older adults experience the phenomenon through their social practices using mobile devices in other settings, such as in their workplace, and community environments such as their academic or ecclesiastical communities. These findings would provide significant further insight into older adults' information literacy using mobile devices as a social practice in other settings. In addition, these findings would help explain the nature and scope of information literacy as a social practice.

Hence, further research about how older adults' experience of information literacy using mobile devices in social settings and community environments is recommended.

6.9.3 Exploring the phenomenon in different contexts

This research has explored how older Australians experience information literacy using mobile devices. Future research studies could build on these findings by extending this study to investigate how the phenomenon is experienced among older adults in another country.

The findings of this research have revealed that older adults make use of social media and particular apps regularly using their mobile devices. Hence, further research could investigate how the phenomenon is experienced in different social media (e.g., Facebook, Yahoo) or particular apps (e.g., web browsers: google, safari; instant messaging apps: Messenger, email, WhatsApp; entertainment apps: iTunes, Netflix, games).

6.10 Conclusion

This thesis contributes to knowledge by providing an account of research that has investigated the information literacy experience of older adults using mobile devices. During the process of ageing, physical and cognitive changes impact how older adults make use of their mobile devices, particularly related to their experiences with information. The findings from this study reveal that information literacy experience using mobile devices plays a crucial role in the ageing process. Information literacy

is an important tool to help older adults to acquire the skills and basic knowledge that allow them to access and make use of mobile devices, enabling them to access information which is essential to enact their everyday lives and improve their quality of life. The findings from this study affirm that older adults access information independently, at any time and from anywhere, thanks to the use of mobile devices, which improves considerably their everyday lives and quality of life.

The core of the findings, a new theory named Older Australians' Mobile Information Literacy: A Grounded Theory, consists of six categories that provide a greater understanding of older adults' information literacy experience using mobile devices, and contributes to several research domains such as library and information science practice, mobile devices research and particularly information literacy research.

In conclusion, this study provides evidence of the relevance of information literacy for older adults in the context of mobile devices. It uncovers a rich and contextualised understanding of how older adults experience information literacy using mobile devices in a holistic sense, and makes an important contribution to both theory and practice, adhering to Constructivist Grounded Theory principles. This study provides a firm foundation for future research by examining and reflecting upon older adults' information literacy experience and particularly on ways for engaging with information using mobile devices.

References

Abad, L 2014, 'Media literacy for older people facing the digital divide: The e-inclusion programmes design', *Comunicar*, vol. 21, no.42, pp. 173-180.

Abdi, E S 2014, 'Web professionals: how do they experience information literacy?', Doctoral dissertation, Queensland University of Technology, Brisbane.

Acharya, KR 2015, 'Aging, e-literacy, and technology: Participatory user-centered design for older adults' digital engagement', *Journal of Literacy and Technology*, vol.16, no. 2, pp. 2-32.

Adams, A & Cox, AL 2008, 'Questionnaires, in-depth interviews and focus groups' in P Cairns and AL Cox, Anna (eds), *Research Methods for Human Computer Interaction*, Cambridge University Press, UK, pp. 17–34.

Aguilar, A, Boerema, C & Harrison, J 2010, 'Meanings attributed by older adults to computer use', *Journal of Occupational Science*, vol. 17, no.1, pp.27-33.

Aharony, N & Bronstein, J 2014, 'Academic librarians' perceptions on information literacy: the Israeli perspective', *Libraries and the Academy*, vol. 14, no. 1, pp. 103-119.

Alexandria Proclamation 2005, viewed 15 May 2015, <http://archive.ifla.org/III/wsis/BeaconInfSoc.html>.

American Library Association 1989, *Presidential Committee on Information Literacy. Final Report*, American Library Association, Chicago, viewed 3 March 2015, <http://www.ala.org/acrl/publications/whitepapers/presidential>.

American Library Association 2000, *Information literacy competency standards for*

higher education, American Library Association, Chicago, viewed 5 March 2015, <https://alair.ala.org/bitstream/handle/11213/7668/ACRL Information Literacy Competency Standards for Higher Education.pdf?sequence=1&isAllowed=y>.

Anwar, M, Joshi, J & Tan, J 2015, 'Anytime, anywhere access to secure, privacy-aware healthcare services: Issues, approaches and challenges', *Health Policy and Technology*, vol. 4, pp. 229-311.

Asla, T, Williamson, K & Mills, J 2006, 'The role of information in successful aging: the case for a research focus on the oldest old', *Library and Information Science Research*, vol. 28, no. 1, pp. 49-63.

Asla, T & Williamson, K 2009, 'Information behavior of people in the fourth age: implications for the conceptualization of information literacy', *Library & Information Science Research*, vol. 31, pp. 76-83.

Asla, T & Williamson, K 2013, *The fourth age: human information behaviour and successful aging*, Charles Sturt University.

Australian Bureau of Statistics 2012, *Who are Australia's older people? Reflecting a Nation: Stories from the 2011 Census, 2012–2013*, 2071.0, Australian Bureau of Statistics, viewed 30 July 2015, <http://www.abs.gov.au/ausstats/abs@.nsf/lookup/2071.0main+features752012-2013>.

Australian Bureau of Statistics 2014, *Household use of information technology, Australia, 2012-13*, 8146.0, Australian Bureau of Statistics, viewed 5 March 2015, <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/B10BDF0266D26389CA257C89000E3FD8?opendocument#>.

Australian Government, Australian Communications and Media Authority (ACMA) 2015, *Communications report 2013–14 series. Report 1. Australians' digital lives*, Australian Communications and Media Authority, Canberra, Australia.

Australian Government, Department of Health and Ageing 2011, *Older Australians and the Internet: Bridging the digital divide*, National Seniors Australia Productive Ageing Centre, Canberra, Australia.

Australian Government, Office of the eSafety Commissioner 2018, *Understanding digital behaviours of older Australians*, Office of the eSafety Commissioner, viewed 6 June 2018, <https://www.esafety.gov.au/about-the-office/research-library>.

Australian Government, Productivity Commission 2013, *An Ageing Australia: Preparing for the Future*, Productivity Commission, viewed 19 April 2016, <https://www.pc.gov.au/research/completed/ageing-australia >.

Australian Library and Information Association 2001, *Statement on information literacy for all Australians*, Australia, viewed 12 March 2015, <https://www.alia.org.au/about-alia/policies-standards-and-guidelines/statement-information-literacy-all-australians>.

Balaji, J 2014, 'The ultimate tablet war. Changing the landscape of mobile connectivity in India', in M Sengupta and N Sengupta (comps.) *Contemporary research in management*, SDM Institute for Management Development, Mysore.

Barnard, Y, Bradley, MD, Hodgson, F & Lloyd, AD 2013, 'Learning to use new technologies by older adults: Perceived difficulties, experimentation behaviour and usability', *Computers in Human Behavior*, vol. 29, pp. 1715-1724.

Beal, V 2014, *Smartphone*, viewed 15 September 2015, <http://www.webopedia.com/TERM/S/smartphone.html>.

Beal, V 2018, *Mobile application*, viewed 22 March 2018, <https://www.webopedia.com/TERM/M/mobile_application.html>.

Berkowsky, RW, Cotton, SR, Yost, EA & Winstead, VP 2013, 'Attitudes towards and limitations to ICT use in assisted and independent living communities: Findings from a specially-designed technological intervention', *Educational Gerontology*, vol. 39, no. 11, pp. 797-811.

Birks, M & Mills, J 2011, *Grounded Theory: A practical guide*, SAGE Publications Ltd, Los Angeles.

Blumer H 1969, *Symbolic Interactionism: Perspective and Method*, Prentice Hall, Englewood Cliffs, New Jersey.

Bobillier, ME, Michel, C, Tarpin Bernard, F & Croisile, B 2014, 'Can ICT improve the quality of life of elderly adults living in residential home care units? From actual impacts to hidden artefacts', *Behaviour & Information Technology*, vol. 33, no. 6, pp. 574-590.

Boon, S, Johnston, B & Webber, S 2007, 'A phenomenographic study of English faculty's conceptions of information literacy', *Journal of Documentation*, vol. 63, no. 2, pp. 204-228.

Borges, I, Sinclair, D, Mollenkopf, H & Rayner, P 2008, *Older people and Information and Communication Technologies: An ethical approach*, AGE-The European Older People's Platform, Brussels.

Borglin, G, Edberg, AK & Hallberg, IR 2005, 'The experience of quality of life among older people', *Journal of aging studies*, vol 19, no. 2, pp. 201-220.

Boulton-Lewis, GM, Buys, L, Lovie-Kitchin, J, Barnett, K & David, LN 2007,

'Ageing, learning, and computer technology in Australia', *Educational Gerontology*, vol. 33, no. 3, pp. 253-270.

Brown, TH 2005, 'Towards a model for m-learning in Africa', *International Journal on E-Learning*, vol. 4, no.3, pp.299-315.

Bruce, C 1997a, 'The relational approach: a new model for information literacy', *The New Review of Information and Library Research*, vol. 3, pp. 1-22.

Bruce, C 1997b, *The seven faces of information literacy*, Auslib Press, Adelaide, Australia.

Bruce, C 1999, 'Workplace experiences of information literacy', *International Journal of Information Management*, vol. 19, no. 1, pp. 33-47.

Bruce, C 2008, *Informed learning*, Association of College and Research Libraries, Chicago.

Bruce, C, Davis, K, Hughes, H, Partridge, H & Stoodley, I 2014, *Information experience. Approaches to theory and practice*, Emerald Group Publishing Limited, United Kingdom.

Bruce, C, Hughes, HE & Somerville, MM 2012, 'Supporting informed learners in the 21st century, *Library Trends*, vol. 60, no. 3, pp. 522-545.

Bruce, C & Partridge, H 2011, 'Identifying and delineating information experience as a research domain: A discussion paper', in Social Media and Information Practices Workshop, Boras, Sweden, 10-11 November.

Bruner, J 1990, *Acts of meaning*, Harvard University Press, Cambridge.

Bunce, S, Partridge, H & Davis, K 2012, 'Exploring information experience using social media during the 2011 Queensland Floods: a pilot study', *The Australian Library Journal*, vol. 61, no. 1, pp. 34-45.

Bundy, A 2004, *Australian and New Zealand information literacy framework: principles, standards and practice*, Australian and New Zealand Institute for Information Literacy, Adelaide.

Burnett, G & Lingam, GI 2012, 'Postgraduate research in Pacific education: Interpretivism and other trends', *Prospects*, vol. 42, no. 2, pp. 221-233.

Cameron, D, Marquis, R & Webster, B 2001, 'Older adults perceptions, experiences and anxieties with emerging technologies', *Australasian Journal on Ageing*, vol. 20, no. s2, pp. 50-56.

Carrero, D 2017, Face.co, viewed 12 March 2017, <https://face.co/>.

Cassavoy, L 2014, *What makes a smartphone smart?*, viewed 15 September 2015, <http://cellphones.about.com/od/smartphonebasics/a/what_is_smart.htm >.

Charmaz, K 1990, 'Discovering'chronic illness: Using Grounded Theory', *Social Science & Medicine*, vol. 30, no.11, pp. 1161-1172.

Charmaz, K 2003, Grounded Theory: Objectivist and constructivist methods, in N.K. Denzin & Y.S. Lincoln (eds), *Handbook of qualitative research methodology*, SAGE Publications Ltd, Thousand Oaks, California.

Charmaz, K 2004, 'Premises, principles, and practices in qualitative research: Revisiting the foundations', *Qualitative health research*, vol. 14, no. 7, pp.976-993.

Charmaz, K 2006, *Constructing Grounded Theory*, SAGE Publications Ltd, Thousand Oaks, California.

Charmaz, K 2008, 'Grounded Theory as an emergent method', in SN Hesser-Biber &

P Leavy (eds), *Handbook of emergent methods*, The Guilford Press, New York.

Charmaz, K 2009, 'Shifting the grounds. Constructivist Grounded Theory methods', in Janice M. More (ed.), *Developing Grounded Theory. The second generation*, Left Coast Press, Walnut Creek, California.

Charmaz, K 2014, *Constructing Grounded Theory*, 2nd edn, SAGE Publications Ltd, Los Angeles, California.

Chaudhuri, S, Le, T, White, C, Thompson, H & Demiris, G 2013, 'Examining health information-seeking behaviors of older adults', *CIN Computers informatics nursing*, vol. 31, no. 11, p. 547-553.

Chesters, J, Ryan, C & Sinning, M 2013, *Older Australians and the take-up of new technologies*, NCVER, Adelaide, Australia.

Choudrie, J, Pheeraphuttharangkoon, S, Zamani, E & Giaglis, G 2014, 'Investigating the adoption and use of smartphones in the UK: a silver-surfers perspective', *in proceedings of Twenty Second European Conference on Information Systems*, Tel Aviv.

Conley, TM & Gil, EL 2011, 'Information literacy for undergraduate business students: examining value, relevancy, and implications for the new century', *Journal of Business & Finance Librarianship*, vol. 16, no. 3, pp. 213-228.

COTA Australia 2012, *COTA for older Australians. Federal Budget Submission 2012-2013*, COTA Australia, Adelaide, Australia.

COTA National Seniors 2004, *Adult learning in Australia*, COTA National Seniors, Melbourne, Australia.

Cota, TT, Ishitani, L & Vieira, N 2015, 'Mobile game design for the elderly: A study

with focus on the motivation to play', *Computers in Human Behavior*, vol. 51, pp.96-105.

Cotten, SR, Ford, G, Ford, S & Hale, TM 2012, 'Internet use and depression among older adults', *Computers in Human Behavior*, vol. 28, no. 2, pp. 496-499.

Cotten, SR, Anderson WA & McCullough BM 2013, 'Impact of internet use on loneliness and contact with others among older adults: cross-sectional analysis', *Journal of Medical Internet Research*, vol. 15, no. 2.

Creswell, JW 2013, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, SAGE Publications Ltd, Thousand Oaks, California.

Crotty, M 1998, *The Foundation of Social Research: Meaning and Perspectives in the Research Process*, SAGE Publications Ltd, London.

Czaja, SJ & Lee, CC 2007, 'The impact of aging on access to technology', *Universal Access in the Information Society*, vol. 5, no. 4, pp. 341-349.

Davis, K 2015, 'The information experience of new mothers in social media: a Grounded Theory study', PhD thesis, Queensland University of Technology, Brisbane.

Delello, JA & McWhorter, RR 2015, 'Reducing the digital divide: Connecting older adults to iPad technology', *Journal of Applied Gerontology*, pp. 1-26.

Demasson, AE 2014, 'Information literacy and the serious leisure participant: variation in the experience of using information to learn', PhD thesis, Queensland University of Technology, Brisbane.

Denzin, NK & Lincoln, YS (eds) 2011, *The SAGE handbook of qualitative research*, SAGE Publications, Thousand Oaks, California.

Dörnyei, Z 2007, *Research methods in applied linguistics*, Oxford University Press, New York.

Eckerdal, JR 2011, 'To jointly negotiate a personal decision: a qualitative study on information literacy practices in midwifery counselling about contraceptives at youth centres in Southern Sweden', *Information Research*, vol. 16, no.1.

Edwards, S 2006, *Panning for gold. Information literacy and the net lenses model*, Auslib Press, Adelaide.

Edwards, SL, Bruce, CS & McAllister, LM 2004, 'Information literacy research: the consolidation of a theme', *paper presented at the Research Applications in Information and Library Studies*, QUT Brisbane, a pre- ALIA 2004 Conference Event, Brisbane, Australia, 20 September.

Entwistle, NJ 1997, 'Introduction: Phenomenography in higher education', *Higher Education Research & Development*, vol. 16, no.2, pp. 127-134.

Enwald, H, Kangas, M, Keränen, N, Korpelainen, R, Huvila, I & Jämsä, T 2016, 'Opinions and use of mobile information technology among older people in northern finland–preliminary results of a population based atudy', *Proceedings of the Association for Information Science and Technology*, vol. 53, no. 1, pp. 1-5.

Erickson, LB 2011, 'Social media, social capital, and seniors: The impact of Facebook on bonding and bridging social capital of individuals over 65', *Proceedings of the Seventeenth Americas Conference on Information Systems*, Detroit, Michigan, USA.

Etikan, I, Musa, SA & Alkassim, RS 2016, 'Comparison of convenience sampling and purposive sampling', *American Journal of Theoretical and Applied Statistics*, vol. 5, no. 1, pp.1-4.

Fassinger, R 2005, 'Paradigms, praxis, problems, and promise: Grounded Theory in

counseling psychology research', *Journal of Counseling Psychology*, vol. 52, no. 2, pp. 156-166.

Fisher, BC 2014, 'The benefits of cognitive stimulation or training/rehabilitation upon brain function as an efficacious treatment for diagnosed dementia or mild cognitive decline', *Journal of Alzheimer's Disease & Parkinsonism*, vol. 4, no.5, pp.1-3.

Fisher, C 2007, *Researching and writing a dissertation: an essential guide for business Students*, Pearson Education, Harlow.

Fletcher, J & Jensen, R 2015, 'Mobile health: barriers to mobile phone use in the aging population', *Online Journal of Nursing Informatics (OJNI)*, vol. 19, no. 3.

Fondevila, JF, Carreras, M, Seebach, S & Pesqueira, MJ 2015, 'How elders evaluate apps. A contribution to the study of smartphones and to the analysis of the usefulness and accessibility of ICTS for older adults', *Mobile Media & Communication*, vol.3, no.1, pp. 1-17.

Funston, A & Morrison, M 2000, *Investigating gaps and opportunities: young peoples' access to IT in Australia*, The Foundation for Young Australians, Melbourne.

G8 Digital Opportunity Task Force 2001, *Digital Opportunities for All: Meeting the Challenge Report of the Digital Opportunity Task Force (DOT Force) including a Proposal for a Genoa Plan of Action*, 11 May, University of Toronto, viewed 20 May 2015, <http://www.g8.utoronto.ca/summit/2001genoa/dotforce1.html>.

Githens, RP 2007, 'Older adults and e-learning. Opportunities and barriers', *The Quartely Review of Distance Education*, vol. 8, no.4, pp. 329-338.

Glaser, B 1978, *Theoretical sensitivity: Advances in Grounded Theory*, Sociology Press, Mill Valley, California.

Glaser, BG & Strauss, AL 1965, *Awareness of dying*, Aldine Publishing Company, Chicago.

Glaser, BG & Strauss, AL 1967, *The discovery of Grounded Theory: strategies for qualitative research*, Sociology Press, Chicago.

Glaser, BG & Strauss, AL 1999, *The discovery of Grounded Theory: Strategies for qualitative research*, Aldine Transaction, New Brunswick.

Glasersfeld, EV1995, 'Sensory experience, abstraction, and teaching', *Constructivism in education*, pp.369-383.

Global Web Index 2017, *GWI Device*, Global Web Index, London, viewed 21 March 2018, < https://cdn2.hubspot.net/hubfs/304927/Downloads/GWI-Device-Q1-2017-Summary.pdf >.

Goodall, KT & Ward PR 2014, 'Improving access to health information for older migrants by using Grounded Theory and social network analysis to understand their information behavior and digital technology use', *European Journal of Cancer Care*, vol. 23, pp. 728–738.

Grassian, ES & Kaplowitz, JR 2001*, Information literacy instruction: Theory and practice*, Neal Schumann, New York.

Gray, DE 2013, *Doing research in the real world*, Sage Publications, London.

Guba, EG & Lincoln, YS 1994, 'Competing paradigms in qualitative research', in N. K. Denzin & Y. S. Lincoln (eds), *Handbook of qualitative research*, SAGE Publications Ltd, Thousand Oaks, California.

Hardy, G 2001, 'Vicnet: Communication rules ok?', *paper presented at the 5th*

National Information Literacy Conference, University of South Australia.

Harlan, MA 2012, 'Information practices of teen content creators: the intersection of action and experiences a Grounded Theory study', PhD thesis, Queensland University of Technology, Brisbane.

Harman, D 1981, 'The aging process', *Proceedings of the National Academy of Sciences*, vol. 78, no.11, pp. 7124-7128.

Harvey, D 1989, *The condition of postmodernity*, Blackwell, Oxford, UK.

HelpAge International 2015, *Global Age Watch Index 2015*, Centre for Research on Ageing, London, viewed 20 April 2015, <http://www.helpage.org/global-agewatch/population-ageing-data/country-ageing-data/?country=Australia >.

Henderson, A, Twentyman, M, Eaton, E, Creedy, D, Stapleton, P & Lloyd, B 2010, 'Creating supportive clinical learning environments: an intervention study', *Journal of clinical nursing*, vol. 19, no.1-2, pp.177-182.

Hepworth, M & Walton, G 2009, *Teaching information literacy for inquiry-based learning*, Chandos Publishing, Oxford, UK

Hill, R, Betts, LR & Gardner, SE 2015, 'Older adults' experiences and perceptions of digital technology:(Dis) empowerment, wellbeing, and inclusion', *Computers in Human Behavior*, vol. 48, pp. 415-423.

Hooyman, NR & Kiyak, HA 2008, *Social gerontology: A multidisciplinary perspective*, Pearson Education, Boston.

Huber, L & Watson, C 2014, 'Technology: education and training needs of older adults', *Educational Gerontology*, vol. 40, no. 1, pp. 16-25.

Human Rights and Equal Opportunities Commission (HREOC) 2000, *Accessibility*

of electronic commerce and new service and information technologies for older Australians and people with a disability, Australian Human Rights Commission, Canberra, viewed 25 April 2015, <https://www.humanrights.gov.au/accessibility-electronic-commerce-and-new-service-and-information-technologies-older-australians-and>.

Jayroe, TJ & Wolfram, D 2012, 'Internet searching, tablet technology and older adults', *in proceedings of the American Society for Information Science and Technology (ASIST)*, Baltimore, Maryland, USA.

Johnston, N, Partridge, H & Hughes, H 2014, 'Understanding the information literacy experiences of EFL (English as a foreign language) students', *Reference Services Review*, vol. 42, no. 4, pp. 552-568.

Juznic, P, Blazic, M, Mercun, T, Plestenjak, B, & Majcenovic, D 2006, 'Who says that old dogs cannot learn new tricks? A survey of internet/web usage among seniors', *New Library World*, vol. 107, no. 1226/1227, pp. 332-345.

Khawaji, MA 2017, 'Overcoming challenges in smartphone use among older adults in Saudi Arabia', PhD dissertation, Iowa State University, Ames, Iowa.

Kelly, GA 1955, *Personal construct psychology*, Norton, New York.

Kirk, J 2002, 'Theorising information use: managers and their work', PhD dissertation, University of Technology, Sydney.

Kmiec, M 2014, 'Developing people's information capabilities: Fostering information literacy in educational, workplace and community contexts', *Library Review*, vol. 63, no. 8/9, pp.701-702.

Kumar, S, Ureel II, LC, King, H & Wallace, C 2013, 'Lessons from our elders: identifying obstacles to digital literacy through direct engagement', *in proceedings of the 6th International Conference on Pervasive Technologies Related to Assistive Environments (PETRA)*, Island of Rhodes, Greece.

Kurniawan, S 2007, 'Mobile phone design for older persons', *Interactions*, vol. 14, no. 4, pp.24-25.

Kvale, S 2008, *Doing interviews*, SAGE Publications Ltd, London.

Lamdin, L & Fugate, M 1997, *Elder learning. New frontier in an aging society*, Oryx Press, Phoenix.

Leung, L 2010, 'Effects of Internet connectedness and information literacy on quality of life', *Social indicators research*, vol. 98, no. 2, pp. 273-290.

Leung, R, Tang, C, Haddad, S, Mcgrenere, J, Graf, P & Ingriany, V 2012, 'How older adults learn to use mobile devices: Survey and field investigations', *ACM Transactions on Accessible Computing*, vol. 4, no. 3, pp. 11:1-11:33.

Limberg, L, Sundin, O & Talja, S 2012, 'Three theoretical perspectives on information literacy', *Human IT: Journal for Information Technology Studies as a Human Science*, vol. 11, no. 2, pp. 93-130.

Lincoln, YS & Guba, EG 1985, *Naturalistic inquiry,* SAGE Publications Ltd, Beverly Hills, California.

Lipu, S, Williamson, K & Lloyd, A 2007, *Exploring methods in information literacy research*, CIS, Wagga Wagga, NSW, Australia.

Lizardo, O 2004, 'The cognitive origins of Bourdieu's Habitus', *Journal for the Theory of Social Behaviour*, vol. 34, no.4, pp. 375-401.

Lloyd, A 2006, 'Information literacy landscapes: an emerging picture', *Journal of Documentation*, vol. 62, no. 5, pp. 570-583.

Lloyd, A 2007a, 'Recasting Information Literacy as Socio-cultural Practice:

Implications for Library and Information Science Researchers', *in proceedings of the Sixth International Conference on Conceptions of Library and Information Science – 'Featuring the Future'*, Borås, Sweden.

Lloyd, A 2007b, 'Learning to put out the red stuff: becoming information literate through discursive practice', *Library Quartely*, vol. 77, no. 2, pp. 181-198.

Lloyd, A 2012, 'Information literacy as a socially enacted practice: Sensitising themes for an emerging perspective of people-in-practice', *Journal of Documentation*, vol. 68, no. 6, pp. 772-783.

Lloyd, A & Williamson, K 2008, 'Towards an understanding of information literacy in context: Implications for research', *Journal of Librarianship and Information Science*, vol. 40, no. 1, pp. 3-12.

Lloyd, A, Kennan, MA, Thompson, KM & Qayyum, A 2013, 'Connecting with new information landscapes: information literacy practices of refugees', *Journal of Documentation*, vol. 69, no.1, pp. 121-144.

Lloyd-Zantiotis, A 2005, 'Working Information: Developing a Grounded Theory of Information Literacy in the Workplace', PhD thesis, University of New England, Armidale, NSW.

Lundh, A & Limberg, L 2008, 'Information practices in elementary school', *Libri*, vol. 58, no. 2, pp. 92-101.

Lupton, M 2008, 'Information literacy and learning', PhD thesis, Queensland University of Technology, Brisbane.

Mackert, M, Mabry-Flynn, A, Champlin, S, Donovan, EE & Pounders, K 2016, 'Health literacy and health information technology adoption: the potential for a new digital divide', *Journal of medical Internet research*, vol. 18, no. 10.

Magsamen-Conrad, K, Upadhyaya, S, Youngnyo, CJ & Dowd, J 2015, 'Bridging the

divide: Using UTAUT to predict multigenerational tablet adoption practices', *Computers in Human Behavior*, vol. 50, pp. 186-196.

Malik, SA & Edwards, ADN 2012, 'Effects of Culture and Age on Attitudes to Mobile Technology', *in International Conference on Computer & Information Science (ICCIS)*.

Manafo, E & Wong, S 2012, 'Exploring older adults' health information seeking behaviours', *Journal of Nutrition Education and Behavior*, vol. 44, no. 1, pp. 85-89.

Mansourian, Y 2006, 'Adoption of Grounded Theory in LIS research', *New Library World*, vol. 107, no. 1228/1229, pp. 386-402.

Marcinkiewicz-Wilk, A 2016, 'Older people in the information society', *Journal of Education Culture and Society*, no.1, pp. 18-28.

Maresova, P & Klimova, B 2015, 'Supporting technologies for old people with dementia: A review', *IFAC-PapersOnLine*, vol. 48, no.4, pp.129-134, viewed 6 May 2018, < https://www.sciencedirect.com/science/article/pii/S2405896315007958 >.

Martin, A 2006, 'Literacies for the digital age: preview of part I', in A Martin & D Madigan (eds), *Digital literacies for learning*, Facet publishing, London.

Martínez-Rolan, X & Piñero-Otero, T 2015, 'Typology and functionality of the mobile applications for seniors. One tap away from activing aging', *Ámbitos*, vol. 29.

Marton, F 2014, *Necessary conditions of learning,* Routledge, Oxford, England.

Maybee, C 2006, 'Undergraduate perceptions of information use: the basis for

creating user-centered student information literacy instruction', *The Journal of Academic Librarianship*, vol. 32, no.1, pp. 79-85.

McMahon, C & Bruce, C 2002, 'Information literacy needs of local staff in cross-cultural development projects', *Journal of International Development*, vol. 14, pp.113-227.

Melhuish K & Falloon, G 2010, 'Looking to the future: M-Learning with iPad', *Computers in New Zealand Schools: Learning, teaching, technology*, vol. 22, no.3, pp. 1-16.

Mikkola, K & Halonen, R 2011, ''Nonsense?' - ICT perceived by the elderly', *in European, Mediterranean & Middle Eastern Conference on Information Systems*.

Miller, FQ 2014, 'Knowledge ecosystems of early career academics: a Grounded Theory of experiencing information use for learning in developmental networks', PhD thesis, Queensland University of Technology, Brisbane.

Morris, A 2007, 'E-literacy and the grey digital divide: a review with recommendations', *Journal of information literacy*, vol. 1, no. 3, pp. 13-28.

Morse, JM, Stern, PN, Corbin, J, Bowers, B, Charmaz, K & Clarke, AE 2009, *Developing Grounded Theory. The second generation*, Left Coast Press, Walnut Creek, California.

Mulatiningsih, B 2017, '#networkedLISprofessionals: Library and Information Science professionals' experience of social media', PhD thesis, Queensland University of Technology, Brisbane.

Murphy, A, Farley, H, Lane, M, Hafeez-Baig, A & Carter, B 2014, 'Mobile learning anytime, anywhere: What are our students doing?', *Australasian Journal of Information Systems*, vol. 18, no. 3, pp. 331-345.

Navabi, N, Ghaffari, F & Jannat-Alipoor, Z 2016, 'Older adults' attitudes and barriers toward the use of mobile phones', *Clinical interventions in aging*, no. 11, pp. 1371-1378.

Niemelä, R, Huotari, ML & Kortelainen, T 2012, 'Enactment and use of information and the media among older adults', *Library and Information Science Research*, vol. 34, no. 3, pp. 212-219.

Pachana, NA & Poulsen, EE 2011, 'Thinking outside the box: Novel uses of technology to promote well-being in older populations', in J Soar, R Swindell & P Tsang (eds), *Intelligent technologies for bridging the grey digital divide*, Information Science Reference, Hershey, New York.

Palsdottir, A 2012, 'Elderly peoples' information behaviour: Accepting support from relatives', *Libri*, vol. 62, no. 2, pp. 135-144.

Partridge, H 2008, 'Community and workplace information literacy: Guest editorial', *Australian Library Journal*, vol. 57, no. 3, pp. 20–210.

Partridge, H, Bruce, C & Tilley, C 2008, 'Community information literacy: developing an Australian research agenda', *Libri*, vol. 58, no. 2, pp. 110-122.

Petsas, S, Tzovaras, D, Makris, L & Strintzis, MG 2001, 'WAP-based personalised health care services' *Proceedings of the 23rd International Conference of the IEEE Engineering in Medicine and Biology Society*, IEEE, Istanbul, Turkey, pp. 3536–3539.

Phillipson, C, Bernard, M, Phillips, J & Ogg, J 2001, *The family and community life of older people: Social networks and social support in three urban areas*, Routledge, London.

Piaget, J 1969, *Judgement and reasoning in the child*, Routledge & Kegan Paul, London.

Pidgeon, N & Henwood, K 2004, 'Grounded Theory', in M. Hardy and A. Bryman, (eds), *Handbook of Data Analysis*, SAGE Publications Ltd, London.

Plaza, I, Martín, L, Martin, S & Medrano, C 2011, 'Mobile applications in an aging society: Status and trends', *Journal of Systems and Software*, vol. 84, no. 11, pp.1977-1988.

Queensland Government Statistician's Office, *Queensland Government population projections: 2015 edition*, Queensland Government Statistician's Office, viewed 12 February 2018, <http://www.qgso.qld.gov.au/products/reports/qld-govt-pop-proj/qld-govt-pop-proj-2015-edn.pdf >.

Rosales, A & Fernández-Ardèvol, M 2016, 'Beyond WhatsApp: Older people and smartphones', *Romanian Journal of Communication and Public Relations*, vol. 18, no. 1, pp.27-47.

Rowe, JW & Kahn RL 1997, 'Successful aging', *The gerontologist*, vol. 37, no.4, pp. 433-440.

Rubens, N, Kaplan, D & Okamoto, T 2011, 'E-Learning 3.0: anyone, anywhere, anytime, and AI', *in International Workshop on Social and Personal Computing for Web-Supported Learning Communities (SPeL 2011)*, Hong Kong, China.

Sarwar, M & Soomro, TR 2013, 'Impact of Smartphone's on society', *European journal of scientific research*, vol. 98, no. 2, pp. 216-226.

Savolainen, R 2008, *Everyday Information Practice: A social phenomenological perspective*, Scarecrow Press, Maryland US.

Sayago, S & Blat, J 2011, 'An ethnographical study of the accessibility barriers in the everyday interactions of older people with the web', *Universal Access in the Information Society*, vol. 10, no. 4, pp. 359-371.

Schatzki, T 2002, *The Site of the Social: A Philosophical Account of the Constitution of Social Life and Change*, Pennsylvania University Press, Pennsylvania.

Seidman, I 2006, *Interviewing as qualitative research: A guide for researchers in education and the social sciences*, Teachers College Press, New York.

Selwyn, N 2004, 'The information aged: A qualitative study of older adults' use of information and communications technology', *Journal of Aging Studies*, vol. 18, no. 4, pp. 369-384.

Selwyn, N, Gorard, S, Furlong, J & Madden, L 2003, 'Older adults' use of information and communications technology in everyday life', *Ageing and Society*, vol. 23, no. 5, pp. 561-582.

Seymore, RG 2012, *Handbook of research methods in social entrepreneurship*, Edward Elgar, Boston.

Shuy, RW 2003, 'In-person versus telephone interviewing', in JA Holstein & JF Gubrium (eds), *Inside interviewing: New lenses, new concerns*, SAGE, Thousand Oaks, California, pp. 175-193.

Smith, A 2014, *Older adults and technology use. Adoption is increasing, but many seniors remain isolated from digital life*, 3 April, Pew Research Center, Whashintong D.C., viewed 9 April 2015, <http://www.pewinternet.org/2014/04/03/older-adults-and-technology-use/>.

Somerville, MM 2015, *Informed systems: Organizational design for learning in action,* Chandos Publishing, Oxford, England.

Soraghan, C, Hermann, S & Boyle, G 2013, 'Design and older people's real issues: Experiences of an engineer assessing technology in the user 's home', *in Human System Interaction (HSI), The 6th International Conference on IEEE*.

Strauss, A & Corbin, J 1990, *Basics of qualitative research. Techniques and Procedures for Developing Grounded Theory*, SAGE Publications Ltd, Newbury Park, California.

Strauss, A & Corbin, J 1998, *Basics of qualitative research: Grounded Theory procedures and techniques*, SAGE Publications Ltd, Newbury Park, California.

Sundin, O, Limberg, L & Lundh, A 2008, 'Constructing librarians' information literacy expertise in the domain of nursing', *Journal of Librarianship and Information Science*, vol. 40, no.1, pp. 21-30.

Thompson, S, Griffin, J & Bowman, K 2013, *The ageing population: New opportunities for adult and community education*, Adult Learning Australia, Camberra.

Tiberio, L, Scopelliti, M & Giuliani, MV 2011, 'Attitudes toward intelligent technologies: Elderly people and caregivers in nursing homes', in J Soar, R Swindell & P Tsang (eds), *Intelligent technologies for bridging the grey digital divide*, Information Science Reference, Hershey, New York.

Todd, RJ 1999, 'Utilization of heroin information by adolescent girls in Australia: a cognitive analysis', *Journal of the American Society for Information Science*, vol. 50, no. 1, pp. 10-48.

Torrisi, G & Messina, M 2013, 'Informational Learning', *Studi Urbinati, B-Scienze umane e sociali*, vol. 80, pp. 335-342.

Tsai, HS, Shillair, R & Cotten, SR 2014, 'Social support and 'Playing Around': An examination of how older adults acquire digital literacy with tablet computers', *in proceedings of the 42nd Research Conference on Communication, Information and Internet Policy (TPRC)*, USA.

Tuominen, K, Savolainen, R & Talja, S 2005, 'Information literacy as a sociotechnical practice', *Library Quarterly*, vol. 75, no. 3, pp. 329-345.

Turner, BS 1998, 'Ageing and generational conflicts: a reply to Sarah Irwin', *British Journal of Sociology*, vol. 49, no. 2, pp. 299-304.

Van Deursen, A & Van Dijk, J 2011, 'Internet skills and the digital divide', *New media & society*, vol. 13, no. 6, pp. 893-911.

Veinot, TC 2007, 'The Eyes of the Power Company: Workplace Information Practices of a Vault Inspector', *The Library*, vol. 77, no. 2, pp. 157-179.

Viswanathan, P 2017, *What is a Mobile Device?*, viewed 10 October 2017, < https://www.lifewire.com/what-is-a-mobile-device-2373355>.

Vosner, HB, Bobek, S, Kokol, P & Krecic, MJ 2015, 'Attitudes of active older Internet users towards online social networking', *Computers in Human Behavior*, vol. 55, pp. 230-241.

Vroman, KG, Arthanat, S & Lysack, C 2015, 'Who over 65 is online? Older adults' dispositions toward information communication technology', *Computers in Human Behavior*, vol. 43, pp. 156-166.

Vygotsky, LS 1978, *Mind in society: The development of higher psychological processes*, Harvard University Press, Cambridge.

Vygotsky LS 1986, *Thought and language*, The MIT Press, Cambridge.

Wagner, N, Hassanein, K & Head, M 2010, 'Computer use by older adults: A multi-disciplinary review', *Computers in Human Behavior*, vol. 26, no. 5, pp. 870-882.

Walton, G & Hepworth, M 2011, 'A longitudinal study of changes in learners'

cognitive states during and following an information literacy teaching intervention', *Journal of Documentation*, vol. 67, no. 3, pp. 449-479.

Wang, L 2010, 'Integrating information literacy into higher education curricula: An IL curricular integration model', PhD Thesis, Queensland University of Technology, Brisbane.

Wang, L, Bruce, C & Hughes, H 2011, 'Socio-cultural theories and their application in information literacy research and education', *Australian Academic & Research Libraries*, vo. 42, no. 4, pp. 296-308.

Webber, S & Johnston, B 2000, 'Conceptions of information literacy: New perspectives and implications', *Journal of Information Science*, vol. 26, no. 6, pp. 381-398.

Webber S & Johnston, B 2002, 'Assessment for information literacy', *paper presented at the International conference on IT and information literacy*, Glasgow, Scotland.

Webster, F 2014, *Theories of the information society*, Routledge, New York.

Wicks, DA 2004, 'Older adults and their information seeking', *Behavioral & Social Sciences Librarian*, vol. 22, no. 6, pp. 1-26.

Williams, M & May T 1996, *Introduction to the Philosophy of Social Research*, UCL Press, London.

Williams, D, Cooper, K & Wavell, C 2014, *Information literacy in the workplace. An annotated bibliography*, Robert Gordon University, Aberdeen, UK.

Williamson, K 2002, *Research methods for students, academics and professionals: Information management and systems*, Centre for Information Studies, Wagga Wagga.

Williamson, K, Schauder, D & Bow, A 2000, 'Information seeking by blind and sight impaired citizens: an ecological study', *Information Research*, vol. 5, no. 4.

Wilson, C & Moulton, B 2010, *Loneliness among Older Adults: A National Survey of Adults 45+*, AARP, Washington, DC, viewed 21 November 2017, <http://assets.aarp.org/rgcenter/general/loneliness_2010.pdf>

Winstead, V, Anderson, WA, Yost, EA, Cotten, SR, Warr, A & Berkowsky, RW 2013, 'You can teach an old dog new tricks: A qualitative analysis of how residents of senior living communities may use the web to overcome spatial and social barriers', *Journal of Applied Gerontology*, vol. 32, no. 5, pp. 540-560.

Xu, Q, Mao, ZM, Arbor, A, Erman, J, Park, F, Gerber, A, Pang, J &Venkataraman, S 2011, 'Identifying diverse usage behaviors of smartphone apps', *in Internet Measurement Conference 2011 (IMC'11)*, Berlin, Germany.

Yates, C, Partridge, H & Bruce, C 2009, 'Learning wellness: how ageing Australians experience health information literacy', *The Australian Library Journal*, vol. 58, no. 3, pp. 269-285.

Yates, C, Stoodley, I, Partridge, H, Bruce, C, Cooper, H, Day, G & Edwards, SL 2012, 'Exploring health information use by older Australians within everyday life', *Library Trends*, vol. 60, no. 3, 460-478.

Yates, CL 2013, 'Informed for health: Exploring variation in ways of experiencing health information literacy', PhD thesis, Queensland University of Technology, Brisbane.

Yorkston, KM, Bourgeois, MS & Baylor, CR 2010, 'Communication and aging', *Physical Medicine and Rehabilitation Clinics of North America*, vol. 21, no. 2, pp. 309-319.

Young, RA & Collin, A 2004, 'Introduction: Constructivism and social constructionism in the career field', *Journal of vocational behavior*, vol. 64, no. 3, pp. 373-388.

Zainal, A, Razak, FHA & Ahmad, NA 2013 'Older people and the use of mobile phones: An interview study', *in International Conference on Advanced Computer Science Applications and Technologies (ACSAT)*, pp. 390-395.

Zurkowski, P 1974, *The Information Service Environment: Relationships and Priorities*, National Commission on Libraries and Information Science, Washington DC.

Appendix A: Reflections on the pilot interviews

This appendix includes brief reflections about the four pilot interviews. The reflections about the two first interviews are focused on the conduct of the interview and the learnings gained, rather than on the data. The reflections of the following two interviews are focused on data. The main purpose of these reflections is to solve any obstacle or problem of the interview process in the pilot study and make changes in the interview process in order to improve the process in the main study.

Interviews one and two

These interviews were undertaken face-to-face and were hold at a time and location of the participant's choice. However, the places chosen by participants resulted noisy and the task of writing the interview transcriptions has been tedious.

I chose to transcribe the interviews myself and it has been a really difficult task due to the background noise. It has resulted very complicated to transcript some words, although I have tried to transcript the interview in detail, word by word. I would like to avoid conducting interviews in places with background noise.

Both interviews made me realize that my interviewing skills need improve. I was extremely concerned about leading the participant with my questions, and I was too focused on this to allow me to effectively manage the interview. As a result, the interview was like I would have liked. I need to get more experience at interviewing.

Interview three

This interview was conducted face-to-face. The participant felt comfortable during the whole interview and he was really active interacting with his tablet and smartphone.

My confidence as an interviewer has increased a little in this third interview and I felt comfortable using probing questions and leading the participant to statements to explore their meaning in more depth.

In this interview, the participant makes use of both devices, tablet computer (ipad mini) and Smartphone (iphone). He was interacting with his tablet most of time, during the interview, helping to tap into the phenomenon. He showed me, in some cases, step by step, how the information was located through the use of his ipad. He provided interesting points to be analyzed and these points made me think about the connection between information literacy and the use of mobile devices, and which concepts should be explored more in depth, in the following interviews.
The participant interacts with his mobile devices for:

- Getting information: the participant finds that getting information related to his job is a priority for him.
- Sharing information: through the use of email, sending and receiving text messages. Further, he uses his mobile devices a lot as tool for his job. He acquires and learns new knowledge through the information that he gets from apps, related to his job. So, he shares this information as a function of his job. Maybe, the participant could feel that it is his responsibility to share this information with each other. I think that this point should be explored more in following interviews and use more probe questions. Other interesting point which is revealed in this interview is: Sharing information as a feeling of belonging to a community. This point is revealed in the last section of the interview and it should be explored more.
- Seeking information as a way of learning and teaching. The participant considers that one of the most important functions in his job is to seek information and use this information in order to teach. This point could be also analyzed more in depth.
- Storing information: the participant uses specific apps to store significant information for him like job appointments.

In this interview, I have realized that there isn't any evidence that the participant uses his mobile devices to create new information, and this point should be explored in the following interviews.

With respect to the participant's information needs, the most relevant information need for the participant would be any information related with his job, although, he

also uses diverse apps to get information about news (BBC, ABC), about weather, travelling and maps.

Getting information like a way or feeling of connection with the world and the feeling of responsibility of sharing the information with each other were themes that emerged in several points during this interview. The participant manifested that mobile devices are useful and helpful tools to get and share information and they provide him with this feeling of connection with the world and they allow him to be responsible in his job of sharing relevant information with each other.

Information as a social support is another theme that it emerges during this interview. The participant works in a church and shares information with his community, teaching them new language, translating the bible…So, in this case information shared acts as social support.

With respect to the information sources used by the participant through the use of his mobile devices, there is evidence to suggest, according to this interview that the participant makes use of specific apps, related to his job, and Internet, using a lot google as tool of searching information. The participant states that these sources, in special google, are very helpful for him. He considers that google is the most efficient tool in order to provide information that he searches. However, during this interview it wasn't explored if the participant used other information sources or why he usually used these ones through his mobiles devices. To explore the participant's knowledge and abilities with respect to the use of information sources through the use of his mobile devices is other interesting point to be analyzed in the future.
This interview also reveals some information challenges for the participant:

- Lack of technological skills to use specific apps (e.g., facebook)
- Lack of ability to control the time that he spends using his mobile devices.
- Fear of losing information, fear of destroying

I would like to explore more these information challenges through the use of mobile devices in following interviews because these information challenges could impact on participant's ability to use new apps, which are unknown for him, and in consequence, in his ability to obtain, search, share and create information.

Other points, to be pointed out, are the positive aspects of using tablet and smartphone to get and share information, according to the participant in this interview:

- The time. They provide information immediately
- They allow to share and get information in a fast way.
- They allow the communication with each other in anywhere and at any time. For instance, Through the use of a translation app it is possible to translate words unknown for refugees or people from overseas, allowing the communication.

Finally, other interesting point revealed during the interview was the significant role of relatives, younger colleagues, in order to support older adults to learn how to use these devices in order to get information. The age could impact on the relationship between older adults and the use of mobile devices to satisfy their information needs.

Interview four

This interview was also conducted face-to-face. The participant makes use of both devices, tablet computer (iPad mini) and smartphone (iPhone). The participant felt comfortable during the whole interview. In this interview, although the participant was encouraged to take her mobile devices with her during the interview, she hardly interacted with them and she felt worried and anxious in a pair of occasions when I asked her to show me how she used it to get information.

Although the participant makes use both devices, she uses more the tablet than the smartphone due to the size of the tablet, which is a little bigger than a smartphone. She uses her smartphone just for reading papers and sending messages. However, she uses her tablet for listening to music, for getting information for travelling, for games, for reading, for doing puzzles. The participant revealed that the use of tablet is easier than smartphone for her, although she didn't know how to explain the reason. This point could be explored more in following interviews: Why do they prefer to use more one mobile device than other in order to interact with the information? What aspects of these mobile devices are easier and suitable of using for older adults to be informed?

In this interview, I realized that my interviewing is a little haphazard and it is really difficult to pursue emergent topics and avoid deflecting the content of the interview. I need to consider how I can conduct better the interview. I need to try that emergent topics come up in conversation while the line of questioning continues.

Lack of interest and the feeling of frustration when the participant did not know how to use new apps to access to the information, or to solve some technological issues, were the main themes that emerged at several points during this interview. These issues include:

- No familiarized with technical vocabulary
- Feeling of being "not clever"
- Lack of technological skills to use specific apps
- Fear of losing information, fear of breaking

In this interview, there is evidence that these issues and feelings impact on the participant's behavior as barrier to information accessing, getting, and sharing through the use of her mobile devices. In this case, the participant prefers to turn it off and she doesn't have interest in learning more. She says: "But I don't experiment with it if there is something wrong I turn it off and I don't try to work it out myself" With respect to the information sources used by the participant through the use of her mobile devices, in this interview, the participant just gets information through the use of specific apps. She doesn't search the Internet to get and seek information. In this interview, the participant just makes use of apps which are familiar for her but she doesn't make use of other information sources because she doesn't know how to access and use them.

In this interview, the main participant's information needs were: information about travelling, location, music and games.

Getting information as feeling of relaxation was other point that emerged in this interview. The participant manifested that reading, doing puzzles and playing games provide her a feeling of relaxation.

"I probably use it the most for games I use them for one, maybe two hours if I have time, there is for my relaxation. Yes, so I can use it for this. Mainly I sit down, and I do puzzles. That's mainly for what I use it."

"I just use it for relaxation. That's probably my main reason for using it, for relaxation"

In addition, this participant also points out the significant role that her relatives (husband and children) play when she needs help with her mobile devices. They teach her how to use them and to solve the problems for her. She considers the importance of learning to make use of these mobile devices in the today society.

Appendix B: Recruitment flyer and social media recruitment messages

Recruitment flyer

Users of smartphone or tablet…

Do you enjoy using smartphone or tablet?

If so, why not share your experiences!

Participate in an interesting research project and help create information and educational services to support your needs!

We are conducting a research project about how you use smartphones or tablets in your daily life. We are looking for users of smartphones or tablets, who are 65 years or over, to know their needs. This is a great opportunity for you to share YOUR experiences. Participation is entirely voluntary.

What you will be asked to do: Participate in an interview face to face.

Incentive: $20 Coles Myer voucher

When: Immediately! So, if you have any free time and would like to participate in this study please contact Gema Linares-Soler (Gema.LInaresSoler@usq.edu.au), the project's principal investigator.

Looking forward to hearing from you.

Gema Linares-Soler | PhD Student
University of Southern Queensland
Faculty of Business, Education, Law and Arts| Linguistics, Adult and Specialist Education School
Library and Information Studies Group | R Block | Level 2
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t: @LinarGema
w: www.gemalinares.wordpress.com/

UNIVERSITY OF SOUTHERN QUEENSLAND

Social media recruitment messages

Facebook post from USQ Facebook account

Calling users of smartphones or tablets (for example, an iPad)!
Are you 65 years or over, and you enjoy using smartphone or tablet?

If so, we are conducting a research project in Toowoomba, about how you use smartphone or tablet in your daily life. If you'd like to participate in this study on smartphone and/or tablet use, this will be conducted through a face-to-face interview of no more than 60 minutes.

Further details on the study and how to participate can be found by clicking on the following link:
LINK to Gema Linares' blog post

Please Note: If you 'comment', 'like' or 'share' this Facebook post, it could appear on your Facebook wall and/or timeline, and on your Facebook friends' newsfeed.

Tweet from USQ and the Twitter Accounts of the Research Team

#Toowoomba Are you 65 years or over? Do you enjoy using smartphone or tablet? Participate in this study.
Info: link Gema Linares' blog post

Appendix C: Interview guide

Setting up for the interview

- Check the participant is comfortable to start and clarify expected max time 60 minutes.

At the start of the interview

- Turn recorder on
- Greeting
- Restate purpose of the project
- Restate consent parameters and clarify agreement to participant.
- Remind participant that the questions are meant to stimulate their thinking. They can answer or not as they wish.
- They can add to or address aspects not directly in answer to the question but which come to mind.
- Check the recorder is working properly.

The interview questions

This will be a semi structured interview with a main question: *Can you tell me how you use your smartphone and/or tablet?*

The interviewer may ask the participant prompt questions to allow him/her to elaborate on his/her responses.

- Can you explain that further?
- Could you tell me more about that?
- What do you mean by that?
- Why is that important?
- Could you give me an example?

Conclusion

- Ask the participant if there is anything they wish to add.
- Thank the participant for their time and contribution to the project.
- Remind the participant of the contact details on the information sheet should they have any queries or concerns in the future.

Finish the interview

Ensure the sound file is saved as soon as practicable to the agreed online repository for safe keeping.

Appendix D: Memo interview with Ben (Participant 3)

Memo: Interview 3 – Date 30 June 2016

This interview was conducted face-to-face. The participant felt comfortable during the whole interview and he was really active interacting with his tablet and smartphone.

My confidence as an interviewer has increased a little in this third interview and I felt comfortable using probing questions and leading the participant to statements to explore their meaning in more depth.

In this interview, the participant makes use of both devices, tablet computer (iPad mini) and Smartphone (iPhone). He was interacting with his tablet most of time, during the interview, helping to tap into the phenomenon. He showed me, in some cases, step by step, how the information was located through the use of his iPad. He provided interesting points to be analyzed and these points made me think about the connection between information literacy and the use of mobile devices, and which concepts should be explored more in depth, in the following interviews.

The participant interacts with his mobile devices for:

- Getting information: the participant finds that getting information related to his job is a priority for him.
- Sharing information: through the use of email, sending and receiving text messages. Further, he uses his mobile devices a lot as tool for his job. He acquires and learns new knowledge through the information that he gets from apps, related to his job. So, he shares this information as a function of his job. Maybe, the participant could feel that it is his responsibility to share this information with each other. I think that this point should be explored more in following interviews and use more probe questions. Other interesting point which is revealed in this interview is: Sharing information as a feeling of

belonging to a community. This point is revealed in the last section of the interview and it should be explored more.

- Seeking information as a way of learning and teaching. The participant considers that one of the most important functions in his job is to seek information and use this information in order to teach. This point could be also analyzed more in depth.
- Storing information: the participant uses specific apps to store significant information for him like job appointments.

In this interview, I have realized that there isn't any evidence that the participant uses his mobile devices to create new information, and this point should be explored in the following interviews.

With respect to the participant's information needs, the most relevant information need for the participant would be any information related with his job, although, he also uses diverse apps to get information about news (BBC, ABC), about weather, travelling and maps.

Getting information like a way or feeling of connection with the world and the feeling of responsibility of sharing the information with each other were themes that emerged in several points during this interview. The participant manifested that mobile devices are useful and helpful tools to get and share information and they provide him with this feeling of connection with the world and they allow him to be responsible in his job of sharing relevant information with each other.

Information as a social support is another theme that it emerges during this interview. The participant works in a church and shares information with his community, teaching them new language, translating the bible…So, in this case information shared acts as social support.

With respect to the information sources used by the participant through the use of his mobile devices, there is evidence to suggest, according to this interview that the participant makes use of specific apps, related to his job, and Internet, using a lot google as tool of searching information. The participant states that these sources, in

special google, are very helpful for him. He considers that google is the most efficient tool in order to provide information that he searches. However, during this interview it wasn't explored if the participant used other information sources or why he usually used these ones through his mobiles devices. To explore the participant's knowledge and abilities with respect to the use of information sources through the use of his mobile devices is other interesting point to be analyzed in the future.
This interview also reveals some information challenges for the participant:

- Lack of technological skills to use specific apps (e.g., Facebook)
- Lack of ability to control the time that he spends using his mobile devices.
- Fear of losing information, fear of destroying

I would like to explore more these information challenges through the use of mobile devices in following interviews because these information challenges could impact on participant's ability to use new apps, which are unknown for him, and in consequence, in his ability to obtain, search, share and create information.
Other points, to be pointed out, are the positive aspects of using tablet and smartphone to get and share information, according to the participant in this interview:

- The time. They provide information immediately
- They allow to share and get information in a fast way.
- They allow the communication with each other in anywhere and at any time. For instance, Through the use of a translation app it is possible to translate words unknown for refugees or people from overseas, allowing the communication.

Finally, other interesting point revealed during the interview was the significant role of relatives, younger colleagues, in order to support older adults to learn how to use these devices in order to get information. The age could impact on the relationship between older adults and the use of mobile devices to satisfy their information needs.

Appendix E: Participant profile form

Participant Profile

Name:

Age:

Gender:

Marital State:

Professional Qualification:

Employed or Unemployed:

If you are employed, where do you work?

What mobile device do you use?

How long have you been using this/these mobile devices?

Do you live alone or with relatives? Who do you live with?