Vera Roos
Jaco Hoffman   *Editors*

# Age-Inclusive ICT Innovation for Service Delivery in South Africa

## A Developing Country Perspective

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# Preface

By the time you read this, some aspects of older persons' use of information communication technology (ICT) in (South) Africa, as well as aspects of the technology artefact described in this volume, may already be out of date: new technologies, new devices, new cohorts of older people with new skills make for perpetual change. The pace of technological renewal is relentless and mindboggling. All of us (not only older users of technology) are constantly having to play catch-up with novel digital technologies that leapfrog across the globe including Africa.

We invite you to join us, step by step, on a journey into the diverse worlds of technological uptake by older persons. The route is set against the backdrop of the daily struggles and real and pressing needs and issues confronting most older South Africans, whether they live in the stagnation of rural villages or in overcrowded informal settlements (slums), characterized by poverty, lack of infrastructure and access to services, low educational attainment, and general exclusion. But it is also a journey of agency, resilience, and joyful connections within and across generations.

From the perspective of development, we drew on Sen's capability approach (1999a, 1991b) for understanding agency. He views development as an extension of an individual's freedoms, and advocacy for political and social freedoms makes individuals partly responsible for their own welfare in that they decide on the capabilities important to them. Accordingly, those who choose to take advantage of ICT have the chance to improve their access to information and expand their capabilities (Grunfeld 2007; Sen 2005, 2010). Crucially, ICT provides opportunities to overcome the spatial and social marginalization that limits health and social care access, and to participate in ways that promote accountability in local government service provision. The global drive towards age-integrated societies and communities informed and motivated our initiative to facilitate technological access—especially by marginalized older individuals—regarding service delivery.

Our vision of drawing on ICT for older persons to stimulate socio-economic development encountered a crucial glitch: we knew next to nothing about how older

persons use their cell phones (mobile devices[1]), or whether it would be possible to plan for ICT interventions. Gathering baseline data, sensitive to the contexts of older users[2], had to be the first vital step on what turned into a six-year journey of transdisciplinary collaboration encompassing different geographical (rural/urban) and institutional (three university campuses) settings, reaching some 430 older persons, and involving 24 researchers and 160 student fieldworkers, while covering a range of domains—research and policy and practice.

Based in South Africa, this exploration is in one sense peculiar to its setting—a developing country with huge inequalities, where colonialism and Apartheid had played their part in marginalizing mostly Black people, and where the older generation bears the brunt of the cumulative impacts of the past. As second-generation socio-gerontologists, we are acutely aware of and sensitive to South Africa as an unequal society whose history of past exclusionary practices is still impacting people's everyday lives. As translational researchers, we are dedicated to informing policy and practice through research that supports, specifically, those older individuals who continue to face the long-term effects of damaging policies, actions, and events that held them back in their younger years. As two White, privileged South African researchers, acknowledging our insider–outsider perspective, we mindfully adopted an other-centred approach and an empathic position. We took care to listen attentively, desiring to learn about and from older individuals, and we intentionally did all we could to adopt the perspective of the older persons in our attempts to see the world through their eyes.

South Africans have long been divided along racial lines. Pre-1994, racial distinctions were used to discriminate against people; post-1994, they became a means for redress. From the inception of our project, we recognized that using race as a category to study technology in the lives of older persons would have two key consequences: first, broad race classification would mask the diversities within groups, as well as individual needs and competencies; and second, it would perpetuate the discriminatory status associated with racial groupings. We therefore decided, instead, to use the SAARF Universal Living Standards Measure (SU-LSM[TM]) as a research instrument. This is a tool which categorizes people according to living standards—from 1 (as the lowest) to 10 (as the highest)—by applying criteria that include access to services, geographic indicators, and

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[1]For the purpose of this book, we refer to 'mobile phone technology' as 'cell phone technology', as this is the term used in South Africa.

[2]The measurement of age and age structuring is increasingly problematic in view of more detailed analyses and conceptualizations of age and ageing. We understand and acknowledge the issues with chronological age and for the purpose to establish a baseline, followed a pragmatic approach. In the early stages of the project, we used 50 years and above as the lower threshold for data collection as this age offered a more realistic reflection of ageing for many people in (South) Africa and, furthermore, help provide data that will indicate emerging trends that might affect policy and planning. Actual birth dates are quite often unknown. This, however, complicated meta-data comparability with data sets that use 60 or 65 as the lower threshold. Generally we have decided on 60 years and older unless where at the point of analysis only disaggregated data for the 65 and older cohorts was available, like in Chap. 3.

ownership of major home appliances and motor vehicles (Haupt 2017; South African Audience Research Foundation 2017). We understand that a marketing tool employed for obtaining data about people's living standards may be regarded as a blunt research instrument, but at the time it offered the only measure available to us for attempting to transcend blatant racial categorization. The inequality fault lines remain so distinctive in South Africa, however, that the LSMs still correlate broadly with race: lower, Black; higher, White. We assume that this might change with time.

In this volume we share, chronologically, a story of the way a problem of ineffective service delivery by local government led to the leveraging of new technology to benefit older South Africans. Baseline LSM data provided the foundation for the development of a technology artefact fit for purpose and context: the Yabelana ecosystem (consisting of a website, an app, and an unstructured supplementary service data (USSD) code). Yabelana (meaning 'to share' in the Nguni language family) turned out to be a first of its kind digital self-sustaining technology artefact that serves as an *e*Directory to provide information about local services or events for (but not exclusive to) older individuals; it also offers them the opportunity to give feedback to service providers, thereby promoting citizen participation and accountability for service provision. The artefact uses cell phone technology, accommodating both older generation (pushbutton) phones and smart phones. In proposing to make use of ICT to promote access to useful information, we did not view it in any sense as the 'magic multiplier for the poorest of the poor' (Ogan et al. 2009, p. 656); we knew that the perceived lack of digital literacy of marginalized groups, and their resultant restricted ability to use or access ICT, will continue to limit participation opportunities and uptake, as well as scope and impact. We believed, nevertheless, that despite the limitations, it is a start.

Yabelana was developed on the basis of data obtained from community-based research findings. With the involvement of students and community partners, we collected data from sample groups of older participants in two data-collection initiatives. In 2014, a small self-funded study—iGNiTe: Older Individuals' Cell Phone Use and Intra/Intergenerational Networks—was implemented to get a sense of older individuals' cell phone use and associated intra/intergenerational relationships. In 2017, when funding had been obtained, the scope was broadened and a new project—we-DELIVER: Holistic service delivery to older people by local government through ICT—was initiated to purposively obtain data about older individuals' cell phone use across deprived rural (Lokaleng) and more urbanized, better resourced settings (Ikageng and Sharpeville). The selected communities differed in terms of their geographical situatedness, described as a small rural area or a large town, depending on population size, and economic and density indicators, as set out by the Department of Cooperative Governance and Traditional Affairs (2016).

The transdisciplinary team members involved in developing the Yabelana ICT ecosystem were all affiliated to the North-West University (NWU). The story of the artefact also reflects part of the story of the institution's transformation and community engagement. It was formed in 2004 as a South African higher education institution, with three campuses. The amalgamation of previously disadvantaged

with well-resourced higher education institutions formed part of the South African Government's vision for transforming the national higher education landscape to address past imbalances, inequalities, and deprivations (Prinsloo 2016). The three campuses are situated in two provinces of South Africa, with Mahikeng and Potchefstroom campuses in North West province, and the Vanderbijlpark campus in Gauteng. The distance between Mahikeng and Vanderbijlpark is approximately 380 km, with Potchefstroom situated about halfway between the two and closer to Vanderbijlpark (see map in Fig. 3.2 in Chap. 3). A total of 58,356 undergraduate and postgraduate students registered with the NWU in 2020, making it the second largest university in the country. At the time the we-DELIVER project was launched in 2017, 13 years after the institutions had merged, there was little evidence of community-based research projects that involved researchers and students from a unified NWU. Collaborative projects across the sites were for the most part restricted to a few academics who had tried to align their own academic programmes. Consequently, researchers and students lacked an understanding of each other's contexts, and the limited contact that did take place contributed to misperceptions. At the time, faculty members on the Mahikeng and Vanderbijlpark campuses perceived the Potchefstroom campus (historically advantaged and better resourced) as having final decision-making authority, thus exerting more influence than its counterparts on the other two campuses. As a way of helping to counter such divisions, the we-DELIVER project was planned and implemented with the deliberate goal of involving researchers across the three NWU campuses as well as across disciplinary boundaries.

But the story in this volume goes beyond the immediate geographical setting of (South) Africa and transcends the temporal aspect of the technology (however interesting in itself). It reflects on older persons' participation, negotiation, and transition into the world of an artefact that offers the potential to access services and activities, and to participate in an inclusive society for all ages. This theme has wider resonance, and demonstrates in particularly acute fashion, a phenomenon witnessed in different ways and stages across the globe: cohorts of older persons negotiating waves of updated and new technologies.

The book is a passage across the digital divide where it is assumed that older users' need for and interaction with technology require special devices with a limited array of functions, bigger digits and screens, and louder ringtones. But on this lesser explored side of the divide, many older persons already own older or newer generation cell phones, and although they are not always skilled to operate the devices optimally, their lives (and phones) are ultimately linked to a whole secretariat of surrogate/proxy operators: neighbours and friends, children and grandchildren; younger generations who are technologically savvy and who are more than willing to help, albeit sometimes for something in return and often with a bit of reluctance. All this complexity added to the never-to-be-forgotten main function of the cell phone for most older persons: a good chat with significant others—keeping and managing the connections.

# Chapter Outline

The chapters in this book present a normative analysis and subsequent development of an ICT artefact (the Yabelana ICT ecosystem). In setting out on this course, we:

– investigated and explored, from individual and relational perspectives, how technology-related development processes can add value;
– endeavoured to understand the dynamics of bottom-up/system-down inclusion of digital technologies in relation to service delivery challenges for older cell phone users; and
– attempted to disentangle and understand the individual, sociopolitical, and environmental conditions that enhance or impede the usefulness of new technologies.

The three-part edited volume presents the processes followed in developing and designing the technology artefact in theme-based chapters.

The three chapters of Part 1, Context and Project Background, situate older persons, in the developing country conditions of South Africa, in relation to much needed services, the legislative background, and the reality of service delivery by local government, as highlighted in the we-DELIVER project. Chapter 1 contextualizes the study within the phenomenon of population ageing and the pressing need to develop ICT appropriate for developing countries. Chapter 2 focuses on poor service delivery by local government to older citizens, despite the guiding legislative frameworks in place, and prompts consideration as to whether and how technology can be used to promote service delivery. Chapter 3 presents a process overview of the two data-collection initiatives.

Part 2, Principles, Processes, and Applications, presents in five chapters the principles and methods followed, and the design and development of the Yabelana ICT artefact to promote older persons' access to information. Chapter 4 engages critically with ethical considerations in a community-based research project. Chapter 5 describes the process of questionnaire development employed to access relevant data. Chapter 6 presents the findings in the form of a baseline assessment of older South Africans' cell phone use across diverse community settings. Chapter 7 reviews the older individuals' cell phone use from an intergenerational perspective. It reveals how warm, optimal, satisfying relationships—the interactions in the space between people—have the potential to cross divides. Chapter 8 outlines the phases involved in the development of the design of the Yabelana ICT ecosystem.

Part 3, Critical Reflections and the Way Forward, consists of two chapters. Chapter 9 reflects (with recommendations, following a problem-solving approach) on the inclusion of marginalized older individuals in the design and development of the Yabelana ICT ecosystem. Chapter 10 reaches into the future of ICT and cell phone technology for the purpose of research, practice, and policy to present transferable knowledge.

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                                                                                         Jaco Hoffman

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# Acknowledgements

It has taken more than a village to write this book.

We acknowledge the contributions of every older person who willingly shared information with us. We honour the older individuals' contributions, which informed the development of the Yabelana technology artefact and have included, with permission, their names or photographs.

We appreciate the following groups of student fieldworkers who volunteered between 2017 and 2018 to participate in the we-DELIVER project: undergraduate and postgraduate students in psychology, social work, and public administration. A special word of appreciation goes to Gwendoline Phumzile Kgatle, who as an undergraduate student went beyond expectation to make practical arrangements for data collection with gatekeepers[3] and liaised with student fieldworkers.

A sincere word of appreciation to all the reviewers of the individual book chapters for their time and commitment. The inclusion of your names is a small token of our appreciation:

Andries Baart, Carel Basson, Jeanie Cavé, Hendri Coetzee, Jacob Jacobus (Japie) Greeff, Marita Heyns, Roelien Goede, Costa Hofisi, Anjonet Jordaan, Matthews Katjene, Norah Keating, Ansie Elizabeth Kitching, David Maree, Machdel Matthee, Petrus Nel, Werner Nell, Sebastiaan Rothmann, Fungai Bhunu Shava, Marius Stander, Gerrit van der Waldt, Chrizanne van Eeden, Alida Veldsman, and Hannelie Yates.

We want to thank the following people for particular assistance: Doris Bohman for reviewing the whole book, Carel Basson for the analysis of statistical information from the respective communities; Amanda Pistorius for graphic design; Anjonet Jordaan for technical assistance; Kareni Bannister for language editing; Elisabeth

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[3]Gatekeepers act as guardians of research participants' interests and facilitate culturally specific access to a community because they are familiar with its organizational structure and the values that ought to inform ethical research conduct (Schroeder et al. 2019; Singh and Wassenaar 2016).

Lickindorf and Graham Baker from Kerlick Academic Services for review and conceptual coherence editing.

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What started out as a problem of service delivery for older persons in South Africa has moved beyond the peculiarity of place, time, and challenge and culminated in the development of a technology artefact (Yabelana ICT ecosystem), thereby promoting (older) individuals' access and connectivity.

In 2018, the transdisciplinary team received the Vice-Chancellor's Award for Excellence in Community Engagement for the development of the Yabelana ICT ecosystem. During the Covid-19 pandemic in South Africa, Yabelana was rolled out to several communities throughout the country to assist them in identifying the services available to them during the 2020/21 national lockdown.

We trust that the transferable knowledge in this volume will cross the digital and other divides—of place, time, class, education, and age—to include older persons as users and acknowledging them as agents of change and development.

Never has so small a device been used so easily by so many to do so much [for] so many (Katz 2006, p. 129).

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**Part III   Age-Inclusive ICT Design and Further Developments**

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**Vera Roos** is a Research Professor in the Ageing and Generational Dynamics in Africa (AGenDA) programme in the Optentia Research Unit at the North-West University, and an Affiliate Research Fellow of the Institute of Population Ageing at the University of Oxford. As a socio-gerontologist, she focuses on relational experiences and, from a community psychology perspective, on the contributions of older individuals in challenged contexts. Vera presented her research on topics related to enabling interpersonal contexts, loneliness, friendship, and intergenerational relations at national and international conferences, and has published widely, including three edited books. Vera developed the Mmogo-method®, a projective visual data-collection tool to enable research participation despite age, language, or cultural barriers and to obtain layered information about personal, relational, and group experiences. Findings from this visual method informed the development of a relational theory, Self-Interactional Group Theory (SIGT), and intergenerational interventions. Her commitment to promoting the well-being of older people in relation to their contextual realities prompted the development of an information and communication eDirectory system, Yabelana, with context-specific information for use on smart and older generation mobile phone devices. Vera Roos is an NRF-rated scientist.

**Puleng Segalo** is a Professor of Social and Community Psychology currently holding the position of the Chief Albert Luthuli Research Chair at the University of South Africa, South Africa. She holds master's and doctoral degrees in Psychology from the Graduate Center, City University of New York. She also holds a doctoral certificate in Women Studies from the same university. Her areas of specialization include community psychology, social psychology, and gender and feminism in psychology. Her research and publications cover a wide range, including gendered experiences of women in various aspects of life, historical trauma,

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**Darelle van Greunen  (Ph.D.)** is a Distinguished Professor of Information Technology and a director of the Centre for Community Technologies at Nelson Mandela University, South Africa. She is an Honorary Professor at Amity University (India), a Fellow of Rural Health of the Discovery Foundation, and an Extraordinary Professor in the Optentia Research Unit at the North-West University. She holds a Ph.D. in Computer Science and has qualifications in several other disciplines. Her research integrates transdisciplinary research and innovation with community engagement through the development and implementation of smart technologies that enable the advancement of education, health, rural, and social development, particularly in low-income communities. She is recognized as one of a handful of innovators who have succeeded in incorporating smart technologies into everyday use. She was the first joint appointment as a senior researcher between a South African university and the German multinational software corporation SAP AG in 2006. She has won awards and international acknowledgment for her groundbreaking research and application development within the African context in realizing her vision of ICT solutions for Africa, by Africans, in Africa. Darelle is an NRF-rated scientist (level C2).

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# Part I
# Context and Project Background

# Chapter 1
# "Leapfrog Technology": Locating Older (South) Africans at the ICT Interface

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**Jaco Hoffman**

*The industrial revolution was another of those extraordinary jumps forward in the story of civilization.*
*—Stephen Gardiner (quoted by River, 2017: 1)*

**Abstract**  This chapter positions itself between the demographic and epidemiological transitioning of the youngest world region in terms of population with its leapfrogging of ICT, specifically cell phone technology. Against the background of poverty and the continuing HIV and AIDS epidemic in (South) Africa, this contribution examines the deep penetration and agentic uptake of cell phones by older persons. It situates these users within their physical and family environments, and within the broader dynamics of intergenerational encounters with younger people. Whereas cell phones are often associated with youth culture, this chapter argues that older persons are very much part of the presence, circulation, and use of information and communication technologies (ICT), albeit for most of them on a basic level. Key cross-cutting strategic considerations for their ICT uptake involve intergenerational investment; harnessing the potential of new technologies for older persons; and inclusion of their input in ICT responses to their needs. To further the aim of achieving a society for all ages, ICT responses are proposed in the domains of social and health care, service delivery, and later-life learning.

**Keywords**  Demographic transition · Epidemiological transition · ICT penetration · Older persons · Socio-economic · (South) Africa

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The fourth Industrial Revolution (4IR) represents rapid and extraordinary advances in technology (the internet, AI, robotics and others) and 5IR incorporates the humanism, purpose, and inclusivity sensitive to the needs of people and the environment.

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## 1.1   Introduction

Africa as a continent and South Africa as a country stand at the nexus of a major demographic and epidemiological transition with the fourth (4IR) and the fifth industrial (5IR) revolutions. Already the continent (including its older population) has leapfrogged into the digital age with a deep penetration and uptake of cell phone technology (Nallen, 2019). By moving straight to this form of mobile technology, many African nations and remote and under-resourced communities are able to sidestep extensive and expensive landline infrastructure. It is even expected that some places will leap directly to 5G (fifth generation mobile network) (Strickland, 2019). With the exception of certain urban areas elsewhere, Africa is popularly known as the "mobile-only continent" (Mail & Guardian, 2014).

For an initial and better understanding of how cell phone technology is used by older persons (60+), as well as the dependencies and dynamics around it, we recognize that contextual factors influence whether and how technology (a device, an app) is acceptable for uptake by and interventions for the broader population and specific population sectors. For example, we consider local conceptualizations of health: whether an intervention is regarded as moral and appropriate, its compatibility with customs, and the way in which family and wider social forces respond to technological devices and associated innovations linked to them. This chapter explores such contextual factors: the current sociopolitical and health trends in (South) Africa[1] as the background against which ICT penetration and uptake take place; and the status and scope of current ICT penetration in (South) Africa, specifically its interface with older populations.

(South) Africa is diverse and her people grow old in a variety of settings, with a wide and unequal range of opportunities, capacities, well-being and life expectancies. While many older persons live in poverty and ill-health, others enjoy wealth, influence or robust health. Despite and because of this huge diversity, a number of critical interrelated background trends need to be brought into play for better understanding of how older persons negotiate ICT.

## 1.2   Background Trends

Most (South) Africans, including older persons, broadly respond to ICT against the backdrop of a set of interrelated cross-cutting trends, including poverty that is exacerbated by rural–urban migration and HIV and AIDS; the epidemiological transition with its increase in non-communicable diseases (NCDs); and changing family dynamics.

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[1] (South) Africa refers to both South Africa and Africa as a continent. Where not thus specified, to South Africa only.

### 1.2.1  Poverty, Unemployment, Illiteracy and Social Protection

Over the last decade, evidence on the situation of older persons evolved largely into two main streams: their vulnerability to poverty and ill health (Lloyd-Sherlock et al., 2014, 2020; WHO, 2017), and the significant contributions they—in particular older women—make to the welfare and capacity development of younger family generations and more generally to their communities (Cohen & Menken, 2006; HAI, 2015). Older persons' care roles in the context of HIV and AIDS and their use of pension income to support the education and health care of children and grandchildren are particularly emphasized (see IDPM/HAI, 2003; HAI, 2004, 2006; Murphy et al., 2017; Ralston et al., 2016).

Most singularly, entrenched poverty characterizes sub-Saharan Africa (SSA), with its huge population diversity. Of the 30 countries with the lowest human development ranking listed in the 2020 Human Development Report of the UN Human Development Index (UNDP, 2020), 28 are situated in SSA.

Although South Africa ranks 114th out of 189 positions in this index and is categorized as an upper middle-income country, it has one of the world's highest levels of economic inequality, with a Gini coefficient of 0.68 in 2015 (Stats SA, 2017; UNDP, 2020). As a legacy of previous policies related to colonialism and marginalization, the group most affected by this entrenched inequality is Black Africans (categorized as such by Statistics South Africa). South Africa's overall unemployment rate reached 32.6% in the first three months of 2021, while the official youth unemployment rate was a staggering 63% (Stats SA, 2021).

One of the most glaring remnants of the country's racial inequality is in the domain of education and literacy, and will remain significant across generations to come. The Bantu Education Act (47 of 1953) (Republic of South Africa, 1953) limited Black South Africans' access to quality education, and its aftermath reverberates beyond the establishment of a democratic South Africa in 1994 when such discriminatory acts were repealed. According to the 2011 census, even as 96% of White South Africans aged 60 and older had attained a secondary or higher level of education, only one quarter of older Black South Africans had been able to do so. While only 1% of older White persons had never received schooling, the rate among older Black adults was nearly 40% (Stats SA, 2014). From 1996 to 2016, the functional illiteracy rate of older adults fell from 62.6% to 47% (Stats SA, 2017). In spite of this improvement, the severe inequality that had for so long persisted in South Africa continued to make educational attainment a significant barrier to the employability of older persons, their skills transfer to younger generations, and their personal autonomy.

With 18.6 million beneficiaries of social security grants in 2020/21 (South Africa Social Security Agency, 2020), the South African government oversees, with Brazil, one of the most rapidly expanding social welfare systems in the developing world to address the issues of abject poverty and inequality. The four social assistance programmes in post-Apartheid South Africa that provide the largest benefits and

are most widely implemented are the Old Age Pension (OAP) at R1,890 ($137) per month, the Disability Grant at R1,890 ($137) per month, the Foster Care Grant at R1,050 ($76) per month, and the Child Support Grant at R460 ($34) per month (see Lund, 2008 for a history and more details of the respective programmes). Over 3.1 million people aged 60 years and older were recipients of the OAP in 2015 compared with 2.7 million in 2011. This number is expected to rise to around 4.0 million beneficiaries by 2021/22 (South Africa Social Security Agency, 2020). Since the implementation of a social security plan in 1928—however patchy and small in scope at that stage—African pensioners have been under considerable moral and normative pressure to share their grants downwards through the generations as an acknowledgement of kin relationships (Sagner & Mtati, 1999). Given the existing gap in the safety net for unemployed persons between 18 and 60 years, coupled with the high unemployment rate, there is an (often unrealistic) expectation among younger generations for support from their older relatives (especially grandmothers) to provide for basic needs as well as airtime/data for communicating purposes with significant others (Rey-Moreno et al., 2016).

Older persons use their pensions to support their own households (Knight et al., 2016) as well as grandchildren (e.g. by paying school fees), children orphaned because of AIDS, household members who are ill (Hosegood, 2009), and unemployed individuals (Klasen & Woolard, 2009). Some older adults are, however, increasingly frustrated that their pension is not being used to secure their own needs (Baart & Hoffman, 2021; Hoffman, 2016, 2019). This high asymmetrical dependency of younger generations on older generations for material support is exacerbated by the continuous impact specifically of rural–urban migration and the HIV and AIDS epidemic (Chepngeno-Langat, 2014; Hoffman & Roos, 2021; Schatz & Seeley, 2015).

### 1.2.2   Migration

Africa is experiencing other major demographic, social and environmental trends, key among them being migration and displacement, urbanization, and the growth of urban informal settlements. SSA is often regarded as the world's fastest urbanizing sub-region (Migration Data Portal, 2021). Urban areas had a population of 567 million people in 2015 and this number is set to double over the following 25 years. The global share of urban residents in Africa is projected to grow from 11.3% in 2010 to 20.2% by 2050 (United Nations, 2017). By 2025, it is expected that there will be 100 African cities with more than one million inhabitants each (Muggah & Hill, 2018). Such trends often signal the urbanization of poverty involving older persons as part of the urban migratory ecosystem, with the implication that they either migrate into overcrowded informal urban settlements or are left in rural areas in a milieu of rural stagnation (Hoffman & Roos, 2021).

The South African case is unique in that, under Apartheid, Black, Indian, and Coloured citizens' movements among geographic areas were severely limited by

legislation; the Group Areas Act (41 of 1950) (Republic of South Africa, 1950) was intended to keep these population groups separate, to restrict them mainly to rural, underdeveloped areas, and to prevent their mobility to urban areas (see Durrheim et al., 2011). The repeal of this Act in 1988 was followed by massive urbanization. In certain provinces, the exodus of working age individuals from a rural area to a city in another province dramatically swelled the proportion of older persons in the population of origin (Stats SA, 2017).

Rural to urban migration of younger kin for work and study opportunities impacts older persons' lives, for the most part adversely. Older parents left behind in a rural area have heightened vulnerability: they must prepare the land and grow crops without able-bodied assistance and are often left with grandchildren to raise. When older parents can no longer cope alone in a rural area, they may follow their migrant children to the urban area, where they have to contend with poor and overcrowded housing in informal settlements, an unfamiliar environment, and attendant urban social ills, all of which place them at risk of displacement and alienation (see Hoffman & Roos, 2021; Nxusani, 2004).

A strong circulatory migration pattern also exists whereby older rural dwellers visit an urban area and join their kin for a number of months each year in order to receive health care and other services. The older migrants then return to their rural homesteads for extended periods during which they sow and reap crops, tend livestock, visit family, and perform traditional rituals. Another trend that has been noted is that of young in-migrants to an urban area who contract AIDS and return to their ancestral rural home to be cared for by an older parent until they die (Nxusani, 2004; Migration Data Portal, 2021; Møller & Ferreira, 2003).

### 1.2.3   HIV and AIDS

South Africa has the most voracious and highest-profile HIV epidemic in the world, with an estimated 7.5 million people living with HIV in 2020—of an estimated population of 60 million—and with a concentrated toll on young adults (UNAIDS, 2020). The epidemic's long-term generational momentum affects both ascending and descending generations, as illustrated by the high proportion of affected grandchildren who live in households headed by older persons (mostly grandmothers), estimated to be up to 60% (Makiwane et al., 2004; Petros, 2010; UNICEF, 2007). With virtually no institutional care options for AIDS patients or orphans, grandmother-headed networks must provide the necessary shelter and care in-house.

Older carers' contribution to HIV and AIDS care management, as well as their own vulnerability and need for support, has been acknowledged in several global policy instruments (UN, 2002a, b), the African Union's Policy Framework and Plan of Action on Ageing (AU/HAI, 2003), and the Valletta Declaration on HIV and AIDS and Older Persons (Help the Aged/International Institute on Ageing [UN–Malta], 2005). These policy instruments and declarations all call for mainstreaming

older persons into the design and implementation of response programmes, both as care providers and as care recipients (Ferreira, 2006).

A substantial body of research spanning more than a decade has been carried out on the effects of the AIDS epidemic on older persons in SSA. Studies on the impact of the disease on older persons in African countries have mainly focused on associated morbidity and mortality rates (Ferreira et al., 2001; Lawn et al., 2008; WHO, 2006), and on resultant dysfunction in affected households (Hosegood et al., 2007; Hosegood, 2009; Nankwanga et al., 2013; Oramasionwu et al., 2011). In South Africa, localized qualitative studies, although not exclusively focused on AIDS, have assessed the perceived needs of older carers in poor settings (Ferreira et al., 2001; Ferreira & Van Dongen, 2004; Singo et al., 2015). Ferreira et al. (2001), Ogunmenfun (2007), and Petros (2010) have prioritized the needs of older care-givers affected by HIV and AIDS for governmental intervention. Kuo's (2010) study is one of the few employing quantitative research methods and focuses on assessing the well-being of adults, including older carers, who provide non-institutional care to children orphaned by AIDS in South Africa, and on identifying factors that mediate well-being. Other studies with implications for older carers have been conducted specifically on the effects of AIDS orphanhood and parental AIDS illness on children, particularly their mental and physical health and general educational out-comes (Cluver et al., 2007). The types of challenges faced by people caring for children orphaned and made vulnerable by HIV and AIDS in communities with high levels of poverty and unemployment are among the real issues to be considered when planning the possibilities of cell phone technology employed for information and support.

Overall, the studies highlight the burden of care (financial, emotional, and physical) and the multiple responsibilities of older carers, particularly women. General findings, furthermore, reveal inadequate support for and knowledge about the needs of older carers (who will care for the carers?). Published reports show loss of economic support in affected households through the illness or death of a breadwinner, insufficient material resources (money, food, and clothing) experi-enced by older carers, and challenges in accessing medical treatment for sick household members due to inability to pay for treatment or for travel to a health-care facility. Apart from the financial and practical effects of caregiving and loss of kin, older persons also experience grief, pain, and anxiety regarding the future. Many neglect their own health-care needs because of the time and resources they devote to caregiving (Ferreira et al., 2001; Kuo, 2010; Small et al., 2017).

### 1.2.4   Rise in Non-Communicable Diseases

The disease profile of more developed countries normally changes from that of infectious diseases, high child mortality, and malnutrition to a predominance of degenerative and chronic diseases. Developing countries, however, often shoulder a double burden resulting from the simultaneous occurrence of these communicable

and non-communicable disease spectrums. This situation reflects the epidemiological transition in the generally increasing shift of disease and death away from infectious diseases and poor nutrition towards non-communicable diseases (NCDs). While NCDs or chronic diseases are not infectious, they are likely to last longer and need to be managed (Kim & Oh, 2013; WHO, 2018).

More than 87% of health problems related to the global ageing population are due to NCDs such as cancer, diabetes, and heart disease (WHO, 2018). According to Aboderin and Beard (2014), older individuals in the African context are confronted with high levels of disability and ill health, especially stemming from chronic diseases (Institute for Health Metrics and Evaluation [IHME], 2020a, b). The most frequently reported NCDs in SSA are high blood pressure, diabetes, and arthritis, all of which require life-long management. This in turn places a strain on ageing-related resources and consequently on the availability of formal long-term care (Hajat & Stein, 2018). In the HIV-infected population, antiretroviral therapy is likely to increase the prevalence of NCDs, either through the association of drug regimens with NCD risk (Brown & Qaqish, 2006), or as a result of older adults' improved survival into advanced age in which NCD risk rises (Negin et al., 2012) with subsequent implications for social and health-care management.

Higher NCD prevalence has resulted in considerable functional impairment and disability among older adults across SSA. Unlike in high-income countries where, increasingly, modifiable factors mean that older age is no longer a reliable predictor of functional disability (Aboderin & Beard, 2014), data from SSA indicate that rates of illness and disability in older age are significantly higher than in younger age.

Families and communities thus experience mounting pressure to provide almost all long-term care for older adults in the region. However, there are already profound inadequacies in informal (familial) care provision because of economic and infrastructural pressure exacerbated by migration, as well as by mental and physical caregiver stress (Aboderin & Hoffman, 2017; Nyirenda et al., 2015), and the comprehensive social and demographic changes caused by HIV and AIDS (Kautz et al., 2010; Schatz & Gilbert, 2014).

## 1.2.5 Families and Intergenerational Relations

Africa understands families and their communities as key social groups —within which older persons' lives unfold and the challenges and opportunities of later life are to be understood. At the same time—and while recognizing the strain on families' capacities and resources—Africa looks to families and communities as a strength upon which development and care in the continent can and must build. Dominant policy instruments draw on the ideal and power of 'the African family' and regard family values and dynamics as a major moral asset in dealing with challenges associated with ageing (Aboderin & Hoffman, 2017). Multigenerational family structures remain prominent in South Africa, where over 75% of older adults live with children or other family members (Stats SA, 2017).

Taking the importance of families in Africa as point of departure, any development responses, across all strategic domains such as education and social and health care, ought therefore to consider where and how existing family, and intergenerational and community arrangements and initiatives can be leveraged and built upon. Such activity must ensure that the capacities and resources of families across contexts are adequately supported.

In a recent review of the ongoing African Union Plan and Action on Ageing (AUPFPAA, 2019), delegates from across the continent identified broad responses for homegrown Africa-relevant development based on families, namely:

– Develop a robust and grounded understanding of the heterogeneity in African family forms, circumstances and dynamics, and the experiences of individuals within them; of the norms and values that underpin families; and of the resources and capacities that families draw upon;
– Map and draw lessons from existing family- and community-based responses on broad development issues;
– Establish and sustain stakeholder-engagement mechanisms and platforms to ensure that families and communities are included in the development of responses for their own issues at hand;
– Include adequate resourcing to support the capacities of families and communities as part of intergenerationally focused responses.

## 1.3   Ageing in (South) Africa

Against the abovementioned background of interrelated socio-economic strains, opportunities, and dynamics, the population structure and epidemiological profile of (South) Africa are in the process of transitioning.

### 1.3.1   Demographic Transition

The *demographic transition* refers to the shift in society from high fertility and low life expectancy rates towards lower fertility and higher life expectancy rates (Guseh, 2016; Population Reference Bureau, 2019). Lower fertility rates and lower mortality rates are important drivers for this demographic transition (Bloom et al., 2015; UNDESA, 2017). The former are particularly important considering the unprecedented imbalance created by a disproportionate number of older persons in relation to younger age groups (Bloom et al., 2015; Guseh, 2016).

Africa, however, is and will remain demographically the youngest of all world regions, its large population share of children and youth representing promise for the continent's future. At the same time, while the proportion of older adults in Africa's

population is expected to remain below 10% in coming decades, their absolute number will grow rapidly—faster than in any other major part of the world.

Defined by chronological age as those aged 60 years and above, the number of older adults in Africa (already 74 million in 2020) is projected to nearly triple to 216 million by 2050. By 2030 alone, the continent will be home to an additional 30 million older persons. Not dissimilar projections emerge when using an alternative criterion to define an older person as someone with 15 years of remaining life expectancy (He et al., 2020).

While the fertility rate in SSA began to decrease over the period 1960 to 2018 (World Bank Group, 2020b), fertility rates in South Africa have decreased substantially, from a previous rate of 6.04 newborns per woman in 1960 (World Bank Group, 2020a) down to 2.32 newborns per woman in 2019 (Stats SA, 2019). Also in South Africa, the absolute number of older persons has been rising. In 2020, there were 5.4 million older persons aged 60 years and above (9.1% of the total population), and this number is expected to go up to 11.6 million by 2050 (Stats SA, 2020; UNDESA, 2017). As the number of older persons increases, so too will the demand for long-term care (LTC), given the simultaneous epidemiological transition (Daviaud et al., 2019; WHO, 2017).

## 1.3.2  Epidemiological Transition

The rise in the absolute numbers of older persons intersects with a rise in the burden of disease. The *epidemiological transition* is identified by a change in the primary causal factors leading to diseases and death, from communicable diseases and poor nutrition on the one hand to a predominance of NCDs on the other (Aboderin & Beard, 2014; Bloom et al., 2015).

The South African case is complex as it constitutes a quadruple burden of disease resulting from (1) communicable diseases (such as HIV and AIDS and tuberculosis (TB)), (2) NCDs (such as diabetes, cancer, hypertension, and mental illnesses), (3) injury and trauma, as well as (4) water-borne diseases that pose a high risk to South Africans, like malaria, which is endemic in small sectors in the country (WHO 2018). This onerous complexity will bring about disabled longevity for many. Older persons in South Africa can expect increased NCDs, mental illnesses related to ageing, and infectious diseases including coronavirus disease 2019 (Covid-19) and HIV and AIDS (Gouda et al., 2019; Solanki et al., 2021).

The numbers of NCDs in South Africa are rising among both rural and urban populations (Gouda et al., 2019; Mayosi et al., 2009). Age correlates strongly with functional disability at the population level from age 70, with those aged 80 and older reporting a threefold increased risk of poor functionality (Gómez-Olivé et al., 2010). Findings by Stats SA (2014) confirm that concurrent with higher ages older persons reported being severely challenged by all functional domains of sight, hearing, communicating, walking/climbing, remembering/concentrating, and self care. Similarly, Scheil-Adlung (2015) found that 86% of people 70 years and

older in South Africa had at least one functional disability. Older persons also often experience multimorbidity, in which they have to manage two or more NCDs (Banerjee, 2015). Clearly, multimorbidities can impact older individuals' capacity to carry out and manage necessary daily tasks (Su et al., 2016), such as bathing or eating independently (Carmona-Torres et al., 2019), and instrumental activities of daily living, such as preparing food, using the telephone, and shopping (Bonder & Bello-Haas, 2009; Guo & Sapra, 2020). In addition, more than 50% of older persons in South Africa had reported difficulties with moving around, 24.8% had reported difficulties caring for themselves, and 67.6% had reported some cognitive or mental challenges (He et al., 2012; Kelly et al., 2019; Phaswana-Mafuya et al., 2013).

Mental health issues are a further growing concern in terms of care management. For example, late-life depression and dementias already constitute an important public health problem, with devastating consequences. In the study by Peltzer and Phaswana-Mafuya (2013), functional disability, poor quality of life, and chronic conditions, including angina, asthma, arthritis, and nocturnal sleep problems, were associated with self-reported late-life depression symptoms. According to South Africa's 2011 census (Stats SA, 2011), there were approximately 2.2 million people in South Africa with some form of dementia; of the older population, about 7% suffer from dementia. The WHO Global Health Observatory data (WHO, 2019a) estimates that there is one psychiatrist per 100,000 of the South African population, and even fewer (0.4%) in the state sector: a situation deemed grossly inadequate. By comparison, the United States and the United Kingdom have 12.4 and 14.6 psychiatrists per 100,000, respectively. Of South Africa's 650 psychiatrists, only three are specialists in geriatric psychiatry; there are only five dedicated psychogeriatric units at South African universities, with Stikland Hospital in the Western Cape offering the only dedicated psychogeriatric unit and training facility in the country. The unit consists of three wards with a bed capacity of 77 (33 male and 44 female). It is oversubscribed, with a long waiting list. This lack of formal (institutional) capacity places greater reliance on family, friends, social support groups, district clinics, and home-based carers (Aartsma et al., 2019).

Compounding the chronic disease burden are the high numbers of people in South Africa living with communicable diseases such as HIV and AIDS and TB. The country's 2018 TB figures revealed as many as 301,000 active cases and 63,000 deaths (WHO, 2019b). It is noteworthy that the demand for LTC in later life has also been shaped by the effects of HIV and AIDS, and the ageing of persons living with HIV (Lloyd-Sherlock, 2019). The Black population in South Africa accounts for the majority of older persons infected with and affected by the virus. The widespread rollout of antiretroviral therapy (ART) in the country has transformed HIV into a manageable chronic condition, and as a result people with HIV are living into old age (Banerjee, 2015). The impact of HIV at the intersection of ageing and other multimorbidities is not yet known but is expected to bring an increasing care load.

The situation is exacerbated by Covid-19, the pandemic that has been high on the public health agenda. As its caseload and death toll increased, so its worsening impacts threaten to reverse all public health gains made in recent years. The severity

and mortalities of Covid-19 have been strongly associated with hypertension and diabetes. The ageing population, having the highest prevalence of multimorbidity, is thus at highest risk of adverse outcomes from Covid-19 (including the mental effects of social isolation). The disease—like any pandemic—impacts heavily on front-line health-care workers and caregivers alike, emphasizing the problem-solving possibilities of giving consideration to creative options involving technology (Jacobs et al., 2020).

The critical effects of the range of demographic and epidemiological transitions is echoed in the rising demand for social and health-related support and even LTC, and for the potentially supportive role that mobile and other technologies could play.

## 1.4   ICT Penetration in (South) Africa

In parallel with the major demographic and epidemiological transitions in Africa, and specifically SSA, acceptance and application of ICT is seeing exponential growth. By the end of 2019, 477 million people in SSA had subscribed to mobile services, accounting for 45% of the population—an increase of 21 million subscribers over the previous year. It was estimated that the mobile market in the region would reach half a billion subscribers in 2021 and a billion mobile connections in 2024. Smart phone adoption has also spread rapidly in SSA: the number of smartphone connections in SSA was expected to almost double over a period of five years to reach 678 million by the end of 2025—an adoption rate of 65% from the 50% of 2020. This growth has been motivated by the availability of cheaper devices and evolving financing models that allow low-income consumers to pay for 4G devices in daily instalments. However, with nearly 800 million people in the region still not connected to the mobile network, the digital divide persists within and across generations. Basic phones, such as flip phones or feature phones, are generally the most common types of mobile device owned by sub-Saharan Africans (Silver & Johnson, 2018; Silver et al., 2019; GSMA, 2020). The exception is South Africa, where a smartphone that connects to the internet and apps is the most accessed device in the country (ICASA, 2020).

According to the General Household Survey (GHS) (Stats SA, 2020), the proportion of households using only cellular phones as a means of communication increased steadily from 85.5% in 2015 to 89.5% in 2018 and to over 90% in 2019 (ICASA, 2020). The influx of mid- to low-cost smartphone brands in the South African market has boosted access to these devices (GSMA, 2020). Unlike the mobile telephony boom, the overall internet penetration in South Africa is lower. At the national level, the GHS reported that in 2018 the proportion of households with access to the internet was 64.7%. Access here means that at least one member in a household can connect with the internet either at home, at work, at a place of study or in an internet café. Within age groups, almost two thirds of those aged 25 to 34 were internet users in 2016, compared with fewer than one fifth of those aged 50 and older (Effective Measure, 2016).

On 30 September 2019, ICASA (2020) recorded 53.4 million smartphone sub-scriptions—up from 46.7 million a year earlier in 2018. The report showed total cellular phone voice subscriptions had risen by 5.7% from 91 million in 2018 to 96 million in 2019. Of this 2019 total, 82 million (85%) were prepaid subscriptions and 14 million (15%) were postpaid subscriptions; in urban areas, the total prepaid mobile phone subscriptions stood at 77.5 million and postpaid subscriptions at 13.7 million. According to ICASA, cellular data subscriptions increased by 18.8% from 65 million in 2018 to 78 million in 2019.

Although older persons in South Africa engage with basic technologies at higher rates than ever before, there is still a significant digital divide within and across generations. This trend is visible despite the lack of disaggregated data for older cohorts and reporting bias towards the younger generations in a range of reports on the status of ICT (Effective Measure, 2016; ICASA, 2020; Silver & Johnson, 2018). With little focus on older adults and lack of training options, the digital divide is perpetuated. A study conducted jointly by the University of South Africa and the University of Glasgow (van Biljon et al., 2013) underlined the fact that the older population was being neglected and marginalized by the technological transition processes. It pointed out that, apart from barriers typically associated with ageing, including vision and hearing loss, the primary impediment to accessibility was older users' discomfort with technology. Nevertheless, cell phones have become the most common form of basic technology uptake among those aged 60 and older.

## 1.5 Locating Older Persons at the ICT Interface

With mobile technology at the heart of SSA's digital journey, researchers, policymakers and practitioners in the region need to conduct research and implement policies and best practices with an eye on all key enablers for development towards a society that caters for all ages. With the final decade of the UN Sustainable Development Goals (SDG) well under way, mobile technology could potentially play an increasing (though not idealized) role in accelerating progress to achieve them amid acute resource and infrastructure limitations in the region (UN, 2015). As ICT interacts with demographic and epidemiological transitioning in the (South) African reality, key strategic departure points and domains should be considered with a specific ageing-inclusive focus.

### 1.5.1 Key Cross-Cutting Strategic Considerations

The realization of comprehensive, cross-sectoral responses in (South) Africa on ageing and older persons at the ICT interface remains sporadic. Too often, action on older persons and technology is viewed as detracting from investments in young persons or other core areas, and is deprioritized or not even considered (AARP/FP

Analytics, 2017). One of the barriers to progress is the absence of an identified strategic process for the inclusion of older populations in ICT advances that builds and clarifies the case and sets out critical priority directions as part of and contributory to efforts to achieve social and economic development objectives. Such a fit-for-purpose process needs to take into account the social, economic, physical, environmental, cultural, and political contexts, and the available technologies that have manifested in the region: the policy and legal architecture; the accumulated body of relevant scientific knowledge of ageing and older populations in (South) Africa; and learning derived from existing ageing responses.

– **Intergenerational investment to harness the potential of new technologies**

New technologies can play an important role in forging responses on ageing. Investments in older populations in terms of ICT are not, however, separate from, marginal to, or detract from core objectives to enhance the prospects of younger generations in pursuit of social and economic development. A recent corpus of intergenerational literature suggests the possibility that strategic investments to enhance capacities and well-being in older age can benefit both older and younger people today and in the future as well as fostering cohesive societies (see Kaplan et al., 2017, 2020). Such investment can harness the links between the lives of old and young, as well as the intergenerational influences that older adults wield on the exposures, opportunities, and perspectives of young people at family, community, and societal levels, and vice versa. Moreover, investment in capacities and well-being in linked/networked lives (Antonucci et al., 2019; Vacchiano & Spini, 2021) has the potential to leverage intergenerational transformative assets through technology as modus: the digital experience of younger generations shared with older persons and, in their turn, older persons' generativity through their investments in younger generations' education.

Any investment made—through technology—to adapt existing or forge new social, health, and economic systems and structures to enhance the capacities, engagement, and well-being of older persons should be developed in conjunction with older persons themselves. Across all strategic action areas relating to their needs it is critical for the perspectives of older persons to be at the centre of the design, planning, implementation, and subsequent reporting of technological responses. Their involvement eliminates exclusion in later life and recognizes, supports, and harnesses older persons' intergenerational roles and influences.

Efforts to build such ICT responses need to take into account and address digital divides between old and young as well as within the older population. These divides reflect different cultures, with various levels of technology-related comfort, acceptance, and skills among successive generations and cohorts of older adults, and will be perpetuated as new technologies are continuously introduced. At the same time, the use of ICT can represent an opportunity to foster intra- and inter-generational connections.

The policy and programmatic implications of such a developmental and generational approach need, in all cases, to consider inter- and intra-generational perspectives in planning, designing, and operationalizing ICT interventions for older

persons. More specifically, the approach calls for the creation, implementation, and monitoring of ICT policies and interventions which enable older persons to acquire ICT skills that are accessible, affordable, and appropriate, and that could be optimized in inter- and intra-generational programming.

– **Include and centre older persons in the development of ICT responses**

To repeat, it is critical that the perspectives of older persons are at the heart of the design, planning, implementation, and reporting on ICT responses to their needs. This means that mechanisms and platforms should be established to ensure that older persons, including those from marginalized and excluded groups, are consulted and actively participate in the processes of policy or programme conception, development, monitoring, and evaluation, principles that are well-established in the extant global policy architecture on older persons (AU, 2002, 2016; UN, 1999, 2002b).

## 1.5.2   Key Domains for Older Persons at the ICT Interface

Locating older persons at the ICT interface highlights a range of pertinent key domains within which ICT developments are currently active or should urgently be addressed and revisited. As an illustration, and apart from the huge role ICT already plays in general communication, crucial key domains for socio-economic development focus on social and health care, basic governmental service delivery and banking, and education in later life as three overarching drivers for sustainable development and growth.

– **Social and health long-term care**

The numbers of older persons who can no longer live independently without the assistance of others and who require care and support are set to rise. Worldwide (SSA included), it is anticipated that the social- and healthcare needs of older-growing populations will be greater than available resources (Aboderin & Beard, 2014). Aligned with African family values, most LTC for such older persons has thus far been provided by families—mainly by unpaid female family carers (Aboderin & Hoffman, 2017). The SSA region lacks extensive and accessible public LTC systems, and here technology could play a crucial part in supporting families and government care management structures.

Care is explained as a multi-dimensional construct (see Abebe & Aase, 2007; Chokwe & Wright, 2012; Ray & Turkel, 2012; Van der Geest, 2002; Watson, 2007; Yeates, 2011) and encompasses a range of interrelated dimensions:

– Health care: all basic or sophisticated medical care actions and interventions;
– Psychosocial care: intangible care activities (e.g. support) to promote the well-being and quality of life of older persons;
– Relational care: effective and meaningful interpersonal contact with peers or between generations (related or unrelated);

– Instrumental and physical care: tangible care, such as assistance with household chores, running errands;
– Structural care: the fair and just distribution of resources; inclusive and non-discriminatory activities and processes; and a physical environment that promotes active participation through policy implementation.

ICT can potentially intensify both social- and healthcare delivery to older persons by complementing existing under-resourced interventions and disburden social- and healthcare systems through innovative solutions over distances (WHO, 2017). Hence, the use of cell phones to assist remote populations to receive more efficient health treatments have proved successful. Initiatives are numerous, and cell phones are becoming legitimate tools for health care as illustrated with three examples (not necessarily focused on older persons).

– HelloDoctor (https://www.hellodoctor.co.za/) is available in 10 African countries; it provides free essential health education with daily healthcare advice vetted by doctors and direct access to talk to or text a doctor for medical advice over the phone.
– Peek Vision (https://peekvision.org/) gives access to eye care and created a smartphone camera adapter that helps to take retinal images in order to diagnose problems with vision. This intervention helps health services to deploy limited resources more effectively to supply cost-effective, targeted treatment.
– Vula Mobile—selected as a 2021 finalist for the Sustainable Development Goals (SDGs) Finance Geneva Summit, hosted by the United Nations Development Programme (UNDP)—connects healthcare workers with specialists by providing a safe and secure platform to refer patients and share advice with on-call specialists to obtain quick and efficient care for their patients (MTN Business, 2020). It offers access to more than 4000 doctors and health-care workers and helped almost 19,000 patients every month in 2020. There is normally no need for doctors to be physically present or even in the same country to offer support. This is a revolution for the current traditional health sector where, in rural South Africa, there is only one doctor to 4500 people, and a single specialist for every 18,500 (WHO, 2019a). Even when there is a clinic nearby, those in need of care still have to rely on an overburdened public healthcare sector. The range of specialities for which Vula Mobile caters includes ophthalmology; cardiology; ear, nose and throat; burns; family medicine; HIV and AIDS; and orthopaedics.

The evidence base for tangible health outcomes of similar promising initiatives from low- and middle-income countries is generally still weak (Tomlinson et al., 2013). At a conference of the UCL Institute for Global Health and the Umeå Centre for Global Health Research, Sweden, entitled "mHealth: Evidence from low- and middle-income countries" (2015), it was observed that many such initiatives are simply driven by new technological capacity rather than by knowledge of potential user populations and contexts. Moreover, development-orientated mHealth (mobile health) projects tend to find an easily identifiable, self-designated 'community', which is employed for pilot testing but is not representative of the wider population.

These approaches do not address the considerable hurdles to securing uptake within a larger population on a more sustained basis, let alone to securing uptake from older users. Commitments to user-centric interventions based on pilot testing rarely result in ongoing participatory design and long-term engagement with actual users (Tomlinson et al., 2013).

– **Service delivery**

South Africa has made substantial progress since 1994 to improve the quality of life of its people by extending basic services to previously un- and under-serviced households, particularly in rural and informal areas (Mutyambizi et al., 2020). Nevertheless, basic service delivery protests in the country have continued to rise after the end of Apartheid (Nengwekhulu, 2009; Nleya, 2011). Municipal IQ (2021) tracks the number of ongoing protests against municipalities' poor service delivery in South Africa and their data show 1225 service delivery protests between 2004 and 2016, with peaks of 237 and 218 in 2018 and 2019, respectively. Dissatisfaction with service delivery has often been cited as the main reason for the increase in protests within South Africa (Akinboade et al., 2014). Within this context, the South African Local Government Association (SALGA) commissioned Roos et al. (2014) to look into service delivery from local authorities to older persons, one of the most marginalized groups adversely affected in accessing basic services to which they have constitutional rights (Du Plessis, 2017). The main findings revealed a lack of access to information and coordination, which prompted the development of an *e*Intervention. This is in line with the South African *e*-Government framework and its ongoing vision of an inclusive digital society in which all citizens can benefit from the opportunities offered by digital and mobile technologies to improve their quality of life. The framework aims to optimize service delivery that provides universal access to government information and services at any time and anywhere, as well as socio-economic development opportunities; its use of ICT also envisages the empowerment of rural and traditional underserved communities (Mawela et al., 2017).

With regard to financial services, the rise of the platform economy (phone-based making or receiving payments and digital banking) in SSA is impressive and provides a further way of involving older persons, especially in view of their situation (in the South African case) as beneficiaries of what is often the only regular source of income in a multigenerational family. More generally, however, in 2019, the number of registered mobile money accounts in SSA reached 469 million, representing nearly half of total global mobile money accounts, and was expected to reach half a billion in 2020. East Africa is the most mature mobile money market in SSA with Kenya at the forefront, accounting for more than half of the total number of registered accounts in the region (GSMA, 2020). Around six in 10 cell phone owners have used their devices for online banking during 2020, with a high of 83% in Kenya, where M-Pesa (https://www.vodafone.com/what-we-do/services/m-pesa/m-pesa-faqs) is a dominant force, widely used by the people at the bottom of the economic pyramid for their daily needs, and the continent's most recognized example of technological leapfrogging (Silver & Johnson, 2018). Africans went from

having no bank accounts or appropriate banking infrastructures to having a widespread mobile money service: the most basic cell phones are now used as money-transfer devices. With over 500 million mobile-money users in 2020, Africa is by far the leading continent for mobile-money services (Velluet, 2020). Suri and Jack (2016) reported the notable long-term effects that mobile-money services had had on poverty reduction in Kenya, especially among households headed by women. These households saw far greater increases in consumption than households headed by men, prompting the question, what insights might a generational perspective add to this report?

– **Learning and education in later life**

Access to adult learning and education is recognized as an essential right. Increasing longevity expands opportunities for attaining basic and advanced education in adulthood and for capitalizing on it to foster inclusive, equitable, tolerant, sustainable, and knowledge-based societies (UNESCO Institute for Lifelong Learning, 2010). Lifelong learning, as generally understood, encompasses all forms of education and embraces a continuum from formal to informal learning. It is based on inclusive, emancipatory, humanizing, and democratic values, and views literacy as the most significant foundation upon which to build comprehensive and integrated life-wide developmental opportunities for people of all ages. Literacy, in other words, forms an essential part of building people's capabilities to cope with the evolving challenges and complexities of life, culture, economy, and society, including technology (Global Education Monitoring Report Team, 2020). Yet, according to the report many older people in SSA, especially women—given cumulative disadvantages over the course of their lives—still lack literacy, as well as access to learning, and education in later life remains minimal.

If user-centric context-appropriate approaches are required for the participation of older persons in cell phone uptake for interventions across strategic domains, late-life learning is imperative. However, just as there are insufficient education and training programmes in South Africa for older adults to gain productive skills, there are too few efforts specifically targeting seniors to help them with the knowledge and skills needed to use basic forms of technology. After 1994, the country's education system underwent significant reforms and budget increases to address the inequalities of Apartheid. In 2008, the government established the Kha Ri Gude ("Let Us Learn") Adult Literacy Programme. It had operated until 2016/17 throughout the country through the Department of Basic Education after which it was suspended by the parliamentary portfolio committee. This programme specifically targeted marginalized segments of the population, with 15% of the 163,833 South Africans over the age of 60 enrolled in 2016. In that year, Kha Ri Gude reached its target of having served 50% of all illiterate adults in South Africa (see McKay & Romm, 2019 for an assessment of the success of the programme). While various NGOs are dedicated to adult education, they do not focus on older persons because their funders do not believe this would be the most productive use of their financial support or investment. A further impediment is that government funding for education and training has imposed age limits on its beneficiaries (AARP/FP Analytics, 2017).

The massive adoption of cell phones across generations with ICT interventions across key development domains offers opportunities for the country and the continent to create its own growth model for the integrated long-term social and health care of its older populations.

## 1.6   Conclusion

Acceptance and application of ICT—especially mobile technologies—in (South) Africa is growing exponentially, with older persons both as active agents and beneficiaries of ICT utilization and interventions. After lagging behind the rest of the world in technological infrastructure for decades, Africa's enthusiastic response to mobile phone possibilities has enabled the continent to leapfrog its way into ICT. The potential of ICT to play an important role in development—economic, political, and social—is well documented and accepted (Neves & Vetere, 2019; Sayago, 2019). The scale and scope of the leapfrogging process could, however, in its bedazzled state overlook the small steps that are vital in encouraging technology acceptance and adoption by older users (Raiti, 2007).

A synthesis from a reading of the background literature about ICT in (South) Africa suggests some broad medium- and long-term responses by civil society and governments, specifically for older users:

– Map, draw lessons learned from, and build on, acceptable, affordable, culturally appropriate and accessible ICT interventions and programmes for older persons;
– Consider intergenerational perspectives in planning, designing, and operationalizing ICT interventions for older persons;
– Develop, implement, and monitor ICT policies and interventions that enable older persons to acquire ICT skills that are accessible, affordable, appropriate and could be optimized in intergenerational programming;
– Allocate adequate resources and infrastructure to ensure ICT that is accessible, affordable and appropriate for older persons;
– Urge governments to enact inclusive legislation and policies that guarantee that older persons will be able to acquire necessary ICT skills.

The mobile industry's contribution to the SDGs and the continent's wider development goals are demonstrated in three main strategies to which older generations could contribute and from which they could benefit (UN 2015):

– Deploying infrastructure and networks that act as a catalyst for a diverse and innovative range of services within the different domains of social and health care, education, and the economy;
– Ensuring access and connectivity by the provision of infrastructure and more affordable data through which the unconnected are connected so that no one, including older persons, is left behind;

– Enabling interventions and operationalizing relevant content against the conventional backdrop of considerable infrastructure and funding gaps.

The ageing of (South) Africa's population is, and must be recognized as, another key marker of the continent's unique demography and its inherent potential. The country and the continent now face the urgent challenge and opportunity to forge practices, systems, and institutions, as well as legal, policy, and technological/digital environments that will serve the needs and harness the capacities of present and future cohorts of older persons, in support of the continent's overall development aspirations.

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# Chapter 2
# Municipal Service Delivery to Older Persons: Contextualizing Opportunities for ICT Interventions

**Vera Roos, Anél du Plessis, and Jaco Hoffman**

**Abstract** This chapter has a threefold aim: (1) to contextualize older persons' inclusivity at municipal level as outlined in Goal 11 of the United Nations Sustainable Development Goals (SDGs) and international, African regional and South African law and policy frameworks; (2) to obtain an assessment of service delivery by local government, and (3) to reflect on gaps in service delivery and offer suggestions. Stratified sampling was used and information obtained through semi-structured interviews, emailed responses and focus groups from representatives ($n = 17$) on three local government levels, NGO representatives ($n = 5$), and officials from the South African Local Government Association (SALGA) and the Department of Social Development ($n = 26$). A sample of older persons ($n = 302$) from a rural area and two large towns in North West and Gauteng provinces completed questionnaires and participated in semi-structured interviews ($n = 14$) and focus groups ($n = 22$). Findings indicated compromised service delivery related to local government officials' systemic, managerial, and capacity challenges. Municipal services were either non-existent or age-inappropriate. Local government's unresponsiveness leaves older people at risk—particularly those who lack social networks. We present suggestions to address the disconnect between the intent of

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laws and policies for inclusivity and municipal service delivery, and the service delivery experiences of older persons.

**Keywords**  Basic and municipal service delivery · Developing country · Information and communication technologies (ICT) · Law and policy frameworks · Older persons · South Africa

To address the precariousness of most South Africans across the life-course, and more specifically of a growing older population, provision of effective and efficient delivery of timely and reliable basic public services is crucial, as too are more specialised interventions for targeted populations. Public service delivery, therefore, is identified as one of the most important ways of reducing poverty and improve socio-economic conditions.

Within the broader ambit of this book—to design and render appropriate services and interventions—it is paramount to understand sociopolitical context (see Chap. 1), the law and policy architecture, and the programmatic dynamics embedded in that context. While much has been published about municipal service delivery deficits in general, little research has been undertaken to interrogate the non-compliance for service delivery based on the law and policy for older persons in South Africa. The inclusion of older persons in service delivery is becoming increasingly topical given the focus in international policy on the notion of inclusivity of older populations across life domains.

Accordingly, this chapter describes and analyses, from international and local perspectives, with specific reference to older persons, the *de jure* ideals expressed in the law and policy structure that directs South Africa's municipal service delivery. The *de facto* experiences of service delivery to older persons are then described and analysed from the points of view of municipal officials across municipalities, and of older persons from a range of settings on the rural–urban continuum. We conclude the chapter with suggestions for including among others the use of technology as a way to enhance inclusive municipal service delivery in accordance with the notion of 'leaving nobody behind' (see United Nations 2030 Agenda).

## 2.1    Municipal Service Delivery for all Ages

Globally, local government (also referred to as city authorities) is regarded as the organ of state best placed to provide basic services to communities, and to do so in ways that are safe, resilient, sustainable and inclusive. Reddy (2016) describes service delivery by local government as "the provision of municipal goods, benefits, activities, and satisfactions that are deemed public, to enhance the quality of life in local jurisdictions" (p. 2). Quality of life at the municipal level is also a focus of Goal 11 of the United Nations Sustainable Development Goals (SDGs), whose first target is access for all to adequate, safe and affordable housing, and basic services by 2030.

The post-1994 democratic developmental South African state opted for a strong local government system, as embodied in Chapter 7 of the Constitution of the Republic of South Africa, 1996 (Constitution, 1996) and subsequent government laws and policies. All the country's people are legally entitled to local government services, hence this Chapter is embedded in the social contract theoretical framework (Kaplan, 2017; Muggah et al., 2012). This points to the mandate of this level of government to render, maintain, and facilitate services to address basic communal needs as well as to facilitate the social transformation needs of all.

In South Africa, delivery and sustained upkeep of basic municipal services have proved unreliable at times, in some cases failing totally, thereby endangering local communities and compromising their human rights (Stats SA, 2016). Dysfunction in many municipalities assumes different forms: notably, the lack of ethical conduct and political and management will to make sound appointments; failure to act responsively and responsibly on contentious issues; failure to pass municipal budgets; inability to obtain unqualified audits; and, of particular relevance, failure at the local citizen interface to communicate properly with communities and address their needs (Atkinson, 2007; Booysen, 2012; Koma & Modumo, 2016; Kroukamp & Cloete, 2018; World Bank, 2011).

Given South Africa's Apartheid past, accessibility to basic services relates closely to social inclusion and social capital. It follows that failure by municipalities to deliver services can have a detrimental impact on social and economic development (Stats SA, 2016), and on communities' perceptions and experience of responsive and responsible local government. Municipal service delivery failures provoked violent and widespread responses, particularly since 2010 (Banjo & Jili, 2013; Johnston & Bernstein, 2007; Stoffels & Du Plessis, 2019). Some residents withheld their municipal rates and taxes (in so-called rates boycotts) as a sign of revolt against poor municipal service delivery (May, 2010).

Against this background, information and communication technologies (ICT) offer promise as a key to citizen-centred municipal service provision. The potential of ICT for development, and the effects of its widespread and increasing diffusion, have been the focus of a range of investigations in emerging economies (Avgerou, 2010; Heeks, 2010; Pozzebon & Diniz, 2012). Studies on this theme are commonly based on the premise that ICT can help to change socio-economic conditions for the better in developing countries (Mann, 2003; Walsham et al., 2007), thereby improving governance in terms of the social contract between society and state (Kanungo & Kanungo, 2004; Kaplan, 2017).

The next section elaborates on South African law and policy architecture relevant to citizen-centred municipal service provision, especially for older persons.

## 2.2    A Law and Policy Framework that Protects, Enables, and Directs

At the international, African regional, and national levels legal mechanisms exist that protect vulnerable groups, enable local government action towards inclusivity, and direct the way in which public services (including municipal services) should be rendered, broadly drawing on social contract theory.

### 2.2.1    International Policy Calling for Inclusivity at the Local Level

The rights of marginalized groups, including older persons, are fairly well articulated in international and African regional law, policy and multilateral statements. Examples include the 1982 Vienna International Plan of Action on Ageing (UN, 1982), the 1991 United Nations Principles for Older Persons (United Nations General Assembly, 1991), the 2002 Madrid International Plan of Action on Ageing (MIPAA) (United Nations, 2002), and the 2003 African Union Policy Framework and Plan of Action on Ageing (AU/HAI, 2003), alongside human rights instruments such as the Universal Declaration on Human Rights (UDHR) (United Nations General Assembly, 1948), the International Covenant on Civil and Political Rights (ICCPR) (United Nations General Assembly, 1966a), and the International Covenant on Economic, Social, and Cultural Rights (ICESCR) (United Nations General Assembly, 1966b). The rights and interests of older persons find further protection in African regional instruments such as the African Charter on Human and Peoples' Rights (ACHRP, 1981), the Protocol on the Rights of Women in Africa (AU/HAI, 2003), and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Older Persons in Africa (AU, 2016). While offering only implicit protection to older persons, the international framework is clear about recognising and safeguarding the rights of *everyone* in relation to life, human dignity, non-discrimination and bodily integrity. The thinking at international and regional law level seems to be that older persons ought not to be subject to prejudice on the basis of their age, and ought not to be relegated to a marginalized or disadvantaged position in society. This view translates into advocacy for age-based inclusivity in societies worldwide.

The present century has also seen a proliferation of international policies calling for social inclusion, especially at the local level and in relation to public service delivery. Goal 11 of the SDGs focuses on cities or localities and it envisions that, by 2030, there should be "access for all to basic services . . . inclusive urbanisation and . . . access to safe, affordable, accessible and sustainable transport systems for all . . . with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons". The New Urban Agenda (United Nations General Assembly, 2016) similarly calls for inclusivity at the local level,

and state parties have expressly committed to "fostering healthy societies by promoting access to adequate, inclusive and quality public services". One of the targets set in Africa's Vision 2063 (AU, 2015) is further to provide social protection to at least 30% of vulnerable populations, older persons explicitly included. It also makes mention of transformative E-applications and the information revolution to form the basis of service delivery across the African continent. Vision 2063 is clear on achieving capable institutions and transformed leadership at all levels, with a 2023 target of having "70% of the public acknowledge the public service to be professional, efficient, responsive, accountable, impartial and corruption free" (AU, 2015). In similar vein, the African Charter on the Values and Principles of Public Administration (AU, 2011) sets out, as one of its objectives applicable to sub-national governments (municipalities), "to ensure quality and innovative service delivery that meets the requirements of all users" (Art. 2(1)). The emphasis on innovation links to Article 8 of the Charter, which compels authorities to modernize public services through modern technologies. Notably, one of the Charter's principles posits that public services should adapt to the needs of users (Art. 3(5)) and, further, that an entire section should be devoted to accessing information about service delivery. Explicit provision is made for authorities to establish "effective communication systems and processes to inform the public about service delivery, to enhance access to information by users, as well as to receive their feedback and inputs" (Art. 6(3)). In Africa and elsewhere, increased attention is paid to criteria for rendering basic services by local and other authorities. Service delivery-related duties and the objective of inclusivity are further backed by an encompassing human rights framework.

The body of international law and policy is instructive for South Africa. While much of it is not legally enforceable owing to its 'soft law' character, it indicates a zeitgeist that favours the protection of the interests of marginalized groups such as older persons and the related standards that local authorities are expected to reach in delivering services. The country's 1996 Constitution stipulates that, when interpreting any South African legislation, such as the Local Government: Municipal Systems Act (32 of 2000) (Republic of South Africa, 1998a) and the Local Government: Municipal Structures Act (117 of 1998) (Republic of South Africa, 1998b), "every court must prefer any reasonable interpretation of the legislation that is consistent with international law over any alternative interpretation that is inconsistent with international law". While the Constitution is silent on the status of international policy such as the SDGs or the New Urban Agenda, the government (including municipalities) may arguably be expected to calibrate its planning, decisions and policies with internationally agreed objectives and ideologies. African regional instruments, such as the African Charter on the Values and Principles of Public Administration (AU, 2011), which South Africa has ratified, carry the force of international law and come with binding obligations and instructions. Some of these reach into the scope of governance of sub-national authorities, including municipalities.

### 2.2.2 A South African Law and Policy Framework that Protects the Vulnerable, Enables Action, and Directs those Responsible for Rendering Public Services

South Africa's 1996 Constitution was drawn up to ensure that, post-Apartheid, all its people, whoever they are, would have their basic rights and interests protected. The Bill of Rights covers rights and provisions that direct how all three government spheres (national, provincial, and local) should deliver public services (see Chapter 2 of the Constitution) (Constitution, 1996). An inclusive reading of the Constitution reveals that (a) the government as a whole is responsible for upholding and protecting the rights of all people in South Africa, and (b) all three spheres have a public administration function, but local government alone is tasked with delivering basic services to local communities. Notably, the Constitution divides authority and responsibility among the three spheres of government within a system of cooperative government. Whereas no single sphere has exclusive responsibility for guarding the interests of older persons, local government's explicit mandate is to execute municipal service delivery diligently to the advancement of all sectors of society, including older persons in line with the Older Persons Act (13 of 2006) (Republic of South Africa, 2006) and the Policy for Older Persons (Republic of South Africa, 2005).

The country's constitutional dispensation provides for three categories of municipalities: metropolitan, district, and local. They are referred to collectively as 'developmental local government', a post-1996 concept making local government the service delivery arm of national government. Local government has far more autonomy and responsibility than before and is regarded as co-responsible for the socio-economic development and overall well-being of people in South Africa. Chapter 7 of the Constitution outlines the objects, duties, and powers of municipalities. It makes explicit provision for sustainable delivery of services to local communities and for such communities' involvement in local government matters (s 152 of the Constitution) (Constitution, 1996). Typical basic services that municipalities should render include water services provision, waste removal and solid waste disposal, municipal health services, sanitation services and domestic wastewater and sewage disposal systems (Schedules 4B and 5B of the Constitution). Although the Constitution does not specify categories of intended recipients, municipal services must be rendered within the broader context that older persons, like others, have a constitutionally entrenched right to life, human dignity, privacy, access to sufficient water, access to adequate housing, an environment not detrimental to health or well-being, access to health-care services, access to information held by the state, and the right to just administrative action (i.e. to just and legitimate decisions by authorities) (see Chapter 2 of the Constitution). In other words: the rights of people inform *how* public services should be rendered. The Constitution further dictates that every municipality must provide democratic, accountable, and responsive government for people in the community, and that it must structure and manage its administration, budgeting, and planning processes to give priority to everyone's basic needs. For a municipality to

respond properly and to determine its people's basic needs, special engagement with older persons and their specific requirements is necessary.

National legislation also guides the ways in which municipalities should render services to older persons. A basic municipal service is defined in the Systems Act as "a municipal service that is necessary to ensure an acceptable and reasonable quality of life and, if not provided, would endanger public health or safety or the environment". The Act further stipulates that municipalities should encourage and create conditions for older persons to participate in municipal affairs, including service delivery related decisions and the development and adoption of the Integrated Development Plan (IDP), its compulsory municipal strategic plan. The conditions are not specified but it can be assumed that they would cater for access, safety, and dignity. In addition to participation by older persons through its elected political structures, the municipality must develop and implement other appropriate mechanisms, processes and procedures for community participation, so as to bring about social contract formation. In terms of the Act, municipalities must be guided by what is appropriate for a specific community, with due consideration for new technologies, contemporary channels for mass and individual communication, and novel ways of conveying specific messages. Furthermore, every municipality should further establish appropriate mechanisms, processes and procedures for the receipt, processing and consideration of service delivery complaints, notification of public comment procedures, public meetings, and report-back to the community. The Act dictates that a municipality must take into account the language preferences and usage in the municipality, and the special needs of people who cannot read or write. It is the duty of municipal councils to consult with the local community about the level, quality, range, and impact of municipal services and the available options for service delivery.

Notably, the Act further determines that the administration (officials) of a municipality must establish clear relationships with all community members and provide accurate information about the level and standard of municipal services they are entitled to receive, and must also inform the local community how the municipality is managed. The Systems Act furthermore makes provision for local government instruments including IDPs, which are compulsory municipal strategic plans. These plans (together with spatial and other sectoral plans) are well placed to mainstream the rights and interests of older persons in municipal planning decisions and overall local governance and to direct a municipality's service delivery priorities for a minimum period of four years.

The Promotion of Administrative Justice Act (3 of 2000) and the Promotion of Access to Information Act (2 of 2000) (Republic of South Africa, 2000) provided national legislation aimed at procedural fairness in dealings with municipalities and the accessibility of information they hold (Republic of South Africa, 2000). Such information would typically include service delivery standards. By virtue of their general application, these two Acts embody in more detail older persons' constitutional procedural rights (see sections 32 and 33 of the 1996 Constitution). These rights may typically apply when a municipality makes a decision affecting an older person, or when information in the municipality's possession is needed for an older

person to protect his or her rights. Decisions and access to information of this kind are an everyday part of municipal service delivery.

The Intergovernmental Relations Framework Act (13 of 2005) (Republic of South Africa, 2005) elaborates on measures for cooperative government and inter-governmental relations in the business of government. One of the Act's explicit objectives in its section 4 is to advance "effective provision of services". It draws on the principles for cooperative government and intergovernmental relations contained in Chapter 3 of the 1996 Constitution and is instructive where there is fragmentation within and across organs of states (such as municipalities). It often happens that lack of information-sharing among departments or the misalignment of budgets and planning across spheres of government (local and provincial) causes substandard service delivery. This situation can be equally frustrating for those tasked to render and those entitled to receive services. Not only can the principles and structures provided for cooperative government help to improve inclusive service delivery in a single municipality, but they can also be useful for inter-municipal peer-learning and for sharing lessons learned concerning delivery of services to older persons, specifically.

A project devoted to improving service delivery to older persons requires detailed understanding of (a) the legally entrenched duties of municipalities with respect to service delivery, and (b) people's rights. These duties and rights underpin what everyone, including each older person, is entitled to as a resident of their munici-pality. They remind councils and municipal administrations of their responsibilities in terms of the law. The body of law relating to municipal service delivery finds support in national policy instruments such as the White Paper on Local Government (1998) (Republic of South Africa, 1998c), the National Development Plan Vision 2030 (South African Government, 2012), and the Integrated Urban Development Framework and Implementation Plan (IUDF) (Department of Cooperative Gover-nance and Traditional Affairs, 2016). The IUDF in particular makes it clear that the design of human settlements and other infrastructure must take into account safety and access to adequate housing for, amongst others, older persons. An inclusive reading of the policies mentioned further suggests that the South African govern-ment supports age-friendly cities and towns and urban places that are stable, safe, just and tolerant, embracing diversity, equality of opportunity, and the participation of all people, including the vulnerable. Such urban places would however require access to adequate municipal services and municipal information infrastructure, albeit without people falling trap to a digital divide.

The White Paper on Local Government, adopted shortly after the 1996 Consti-tution, includes nine overarching and instructive principles for municipal service delivery (Republic of South Africa, 1998c). These, presented in Table 2.1, are meant to guide municipalities in their decision-making. For present purposes it is also important to note that by virtue of their constitutional autonomy, municipalities themselves are law and policy makers. They have the constitutional authority to develop local policies and plans (e.g. spatial development frameworks) and to pass and enforce municipal by-laws. Any of these instruments will form part of the overall law and policy framework with which service delivery in a municipality

**Table 2.1** Service delivery principles

| | Principle | Meaning |
|---|---|---|
| 1 | Accessibility of services | Municipalities must ensure that all citizens—regardless of age—have access to at least a minimum level of services. Accessibility also means that services need to be easy and convenient to reach. |
| 2 | Affordability of services | Municipalities must ensure that services are within the financial reach of their people (including older persons), through, for example, setting tariffs that balance the economic viability of continued service provision and the ability of the poor to access services. |
| 3 | Quality of products and services | Services must be suitable for purpose, timely, convenient, safe, continuous, and responsive to the needs of service-users such as older persons. |
| 4 | Accountability for services | Municipal councils are accountable for ensuring the provision of quality services that are affordable and accessible, including to older persons. |
| 5 | Integrated development and services | Municipalities should take into account the economic and social impacts of service provision in relation to municipal policy objectives such as spatial integration and inclusivity. |
| 6 | Sustainability of services | Sustainability in this context denotes financial viability and environmentally sound and socially just use of resources. |
| 7 | Value for money | The best possible use should be made of public resources to ensure universal access to affordable and sustainable services. |
| 8 | Ensuring and promoting competitiveness of local commerce and industry | This principle requires transparency to ensure, for example, that investors are aware of the full costs of doing business in a municipal area. |
| 9 | Promoting democracy | Municipal administrations must promote the democratic values and principles enshrined in the Constitution, including the duty that "services must be provided impartially, fairly, equitably and without bias" (s 195 (1)(d) of the Constitution). |

The Principles for Service Delivery are discussed in the White Paper on Local Government (1998) (Republic of South Africa, 1998c) Section F, paragraph 2.1

must align. These instruments and their conceptualisation can also be developed creatively to advance the position of older persons in a municipal area. One example would be the involvement of older persons in the legally prescribed public participation processes that accompany the adoption of a municipality's IDP or its spatial land-use and management by-law.

This backdrop of international and national law and policy frameworks informs our baseline assessment of the perspectives of government officials involved in, and older recipients of, services delivered.

## 2.3   Baseline Assessment of What Transpires in Relation to Service Delivery

Our assessment of service delivery realities focuses on the perspectives of local government officials, followed by those of older service recipients, in three pilot communities ranging from rural to urban.

### 2.3.1   Perspectives of Local Government Officials

In 2013, the Community Development Directorate of SALGA commissioned the North-West University (NWU) to research the provision of services to older persons (60 years and older) by local government. SALGA is an association of municipalities whose mandate derives from South Africa's Constitution. One of SALGA's main aims is to assist municipalities with policy guidelines for community development. This involves mainstreaming transverse issues pertaining to older persons and children, youth, disability, gender, HIV and AIDS, municipal health services, primary health care, disaster management, safety, and security (South African Local Government Association, 2015).

#### 2.3.1.1   Method

**Procedure** Our baseline study was conducted to explore the status quo of municipal service delivery to older persons, using a qualitative descriptive design proposed by Sandelowski (2000). The research started once ethical approval was granted by the Research Ethics Committee of the NWU. SALGA's community development directorate emailed all 278 municipalities in the country requesting their participation. This communication was followed by an email to the person identified by each municipal manager's office who would act as gatekeeper, clarifying the purpose of the research and method of participation through telephonic interviews or by email. It was emphasized that participation was voluntary, that withdrawal could take place at any stage without consequence, and that participants would not be paid. Confidentiality and anonymity would be assured by using numbers when we referred to participants' verbatim quotations.

Most municipalities had difficulty in promptly indicating a specific, sufficiently knowledgeable person who could provide us with information about services for older persons. It took seven days on average for a municipality to identify such an older persons' coordinator. In the course of our investigation, telephone calls were transferred from one person to another an average of 3.39 times, with a call lasting from three to 11 minutes. Our decision to obtain different perspectives on the basic services delivered by local government to older persons follows the principle that

**Table 2.2** Proportionate stratified sampling

| Province | Total number of municipalities in province | Metros | Districts | Local |
|---|---|---|---|---|
| Eastern Cape | 45 | 2 | 6 | 37 |
| Free State | 24 | 1 | 4 | 19 |
| Gauteng | 12 | 3 | 2 | 7 |
| KwaZulu-Natal | 61 | 1 | 10 | 50 |
| Limpopo | 30 | 0 | 5 | 25 |
| Mpumalanga | 21 | 0 | 3 | 18 |
| Northern Cape | 32 | 0 | 5 | 27 |
| North West | 23 | 0 | 4 | 19 |
| Western Cape | 30 | 1 | 5 | 24 |
| TOTAL | 278 | | | |

doing so would provide in-depth understanding of the topic under investigation (see Ellingson, 2009; Tracy, 2010).

**Context and Participants** We included the 278 municipalities (at the time of the study) in the nine provinces of South Africa to apply the necessary proportionate stratified sampling (see Table 2.2) that would ensure representativeness rather than generalization (Durrheim & Painter, 2006). For each province, the municipality of the capital city was included, and at least one metro, one district municipality, and one local municipality. To provide a representative sample of rural, urban, and semi-urban regions, 46 municipalities (17%) out of a total of 278 formed the final sample at the three levels of municipal government (local, district, and metro). Of the 38% of municipalities that participated in the research, 41% ($n = 7$) were situated in large cities, 18% ($n = 3$) in large towns, and 41% ($n = 7$) in small rural areas (Department of Cooperative Governance and Traditional Affairs, 2016).

Non-governmental organisations (NGOs) with a vested interest in older persons' affairs were also contacted for their perspectives on local government service delivery, and officials from SALGA and the Department of Social Development participated in focus groups.

**Data Collection** Information was obtained from 17 municipal officials and five participants affiliated with NGOs through telephonic semi-structured interviews or via email. Focus groups yielded different perspectives (Flick, 2014) and 26 officials from SALGA and the Department of Social Development participated in two focus groups. Verbatim transcriptions were made of the recorded telephonic semi-structured interviews and focus groups and complimented with the emailed responses.

Qualitative questions were compiled by researchers knowledgeable about issues affecting older persons and by experts in local governance, as presented in Box 2.1.

**Box 2.1**

**Qualitative Research Questions to Obtain Information from Local Government Participants**

1. Are there any special services and programmes offered for older persons (the elderly/senior citizens) in your jurisdiction? If yes, tell me about them and what are they about. How are they executed? What are the scope and duration or sustainability of these? How many people are involved? Would you describe them as successful? (Each one listed) and if so why/why not? How is the impact evaluated? Why are you offering these programmes? What legislative framework drives you? Who provides funding, and how much is provided? (Each one listed.)
2. Are there any other indirect benefits that older persons receive that are not part of the formal services or programmes you offer them?
3. Do you have stakeholder partnerships with the private sector/NGOs/faith-based groups to deliver services/programmes?
4. What are the needs for services and programmes for older persons in the communities you serve?
5. How do/did you determine the needs for services and programmes for older persons?
6. What feedback do you get from older persons about the services/programmes provided for them?
7. What are the challenges that you experience with regard to the provision and implementation of services/programmes for older persons?
8. What do you consider to be the role of local government (municipalities) with regard to the provision of services and programmes to older persons?
9. How do you perceive the role of NGOs/faith-based organizations in the provision of services and programmes to older persons?
10. What recommendations can you make to improve the current services and programmes that are delivered to older persons?
11. What additional services and programmes for older persons would you propose?

**Data Analysis** All textual data were analysed thematically, using ATLAS.ti 8. The researchers familiarized themselves with the data by listening to the recorded interviews several times and reading the transcriptions. Data were coded and themes identified. Thematic maps were refined, named, and described. Researchers from different disciplines independently coded the data and discussed the themes until they reached consensus (see Clarke & Braun, 2013). Following Morse (2015) we conducted peer exploration of the themes among researchers, specialising in legislation and issues affecting older persons.

### 2.3.1.2   Findings

Three themes were identified from the information obtained: first, service delivery was compromised by an unclear mandate and silo-like functioning across different spheres of government as well as within local government; second, service delivery to older persons was not prioritized in the IDPs or in service delivery programmes; and third, while recognizing the valuable contribution of NGOs, lack of collaboration and support within the NGO sector and with local government hampered optimal utilization.

**Unclear Mandate and Silo-Like Functioning Compromise Strategy and Service Delivery** Local government officials saw the Bill of Rights (Constitution, 1996) the Older Persons Act of 2006 (Republic of South Africa, 2006), and the Older Persons' Policy (Republic of South Africa, 2005) as too unspecific to determine their role and responsibilities towards older persons. The officials expressed uncertainty about their roles and responsibilities in delivering services to these residents, and they interpreted such tasks as belonging to the mandate of provincial government and its different departments. For example, the Department of Social Development (DSD) and the Department of Health overlap in the provision of certain services (e.g. home-based care programmes), with the result that the needs of many older beneficiaries were not addressed. A general lack of coordination with and support from district municipalities for local municipalities contributed to the confusion about who was responsible for what in a particular jurisdiction. Local municipalities pointed to inadequate internal, cross-sectoral coordination in terms of responsibility for specific services and programmes for older persons. Municipalities often did not know who their local older persons' coordinator was, as Metro Municipality 12 explained:

> Even within the structures of the municipality, the different groups of vulnerable people are treated or handled in silos—apart from each other. Therefore, what [our municipality] is trying to do is 'transversal mainstreaming' or 'simultaneous mainstreaming'. I understand that certain groups have certain needs, but [am not sure how] to specify that they all have the following needs: housing, safety, participation in local government, access to jobs? And how do we make sure that this group of vulnerable people is not [made] more vulnerable by what we are doing or trying to do—or not doing.

The lack of a defined strategy for older persons is compensated for by offerings of ad hoc activities and once-off random events, such as a Christmas party hosted by the mayor, or other entertainments and outings, according to Local Municipality 5:

> Those people in special groups [i.e. older persons], it is like they are an ad hoc. It is like sometimes they [the municipality] will remember to include us [local government special unit tasked with programmes for older persons], sometimes they won't.

**Older Persons Are Not a Priority in Terms of Programmes and Service Delivery** Most of the municipalities referred to their IDPs as their framework for action. Older persons were mentioned (variously as older persons, elderly, pensioners, the aged) in most of the IDPs, but only a few municipalities included services or programmes for older residents specifically in their financial plans or development strategies.

Local authorities conceded that services and programmes for older persons were not a priority for the municipalities. These residents were often not indicated as a special group in the budgeting process, which according to Local Municipality 1, "focuses on other priorities such as HIV and AIDS, Early Childhood Development Programmes (ECDs), youth programmes and/or small farmers." They explained that budgets are limited, particularly in rural areas, for delivering specific services and programmes to older persons; staff shortages and insufficient human resources mean too few officers are available to implement and sustain delivery of certain programmes; and the attitudes of municipal officers towards older persons and to units for special services representing older persons are often unresponsive. Metro Municipality 12 summarized the sentiments of other local government officials: "While issues like youth, gender, and disability are mandatory, the older person is not." A somewhat contemptuous attitude was revealed when local government officials referred to older persons as a "very boring portion of society" (Local Municipality 6).

**The Role of NGOs in the Provision of Service/Programmes Is Valued but Underutilized** Most municipalities appeared to approve of the role that NGOs played within their municipal jurisdiction but generally failed to capitalize on this resource. Non-profit organisations, which fulfil many of the state's obligations, expressed concern that service delivery was hampered by inefficiency and indifference from provincial governments, which are obliged to pay these organizations a welfare subsidy to render services. Lack of coordination and collaboration among different NGOs in specific communities led to duplication and further limited the effectiveness of service delivery.

## 2.3.2   Perspectives of Older Citizens

Older persons' experiences regarding service delivery were obtained from three communities: Lokaleng (rural area), Ikageng (large town), and Sharpeville (large town) (Department of Cooperative Governance and Traditional Affairs, 2016).

### 2.3.2.1   Method

**Contexts and Participants**[1] The three communities, Lokaleng ($n = 103$), Ikageng ($n = 94$) and Sharpeville ($n = 86$) and its surrounding areas ($n = 15$)—which had links, respectively, to the three North-West University campuses (Mahikeng, Potchefstroom, and Vanderbijlpark)—were purposively selected, and criterion sampling as described by Patton (2002) was applied to select the participants. Lokaleng (Mahikeng) and Ikageng (JB Marks local municipality in Dr. Kenneth Kaunda district) are situated in the North West Province, and Sharpeville in (Emfuleni

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[1] Four participants did not indicate where they live.

local municipality) in the Gauteng Province (see Chap. 3 for detail). A convergent or a concurrent design (see Fetters et al., 2013) was used. A sample of older persons completed questionnaires ($n = 302^2$) and participated in semi-structured interviews ($n = 14$) and focus groups ($n = 22$) about their needs and experiences relating to municipal service delivery.

**Measure** The Living Standard Measure (SU-LSM™) is a South African research measure consisting of 25 questions; it categorises the population in 10 levels, from 1 (lowest) to 10 (highest), to obtain a measure based on standard of living rather than the income of individuals (Eighty20, n.d.; Haupt, 2017; SAARF, 2017). The LSM measure groups people in the total population into relatively homogeneous groups according to criteria such as degree of urbanization, ownership of cars and appliances (Dodd, 2016; SAARF, 2014). The weighted values are translated by statistical calculations into 10 categories, ranging from low (1) to high (10). For the purpose of this chapter, these categories were reduced to five: low (1–2), below average (3–4), average (5–6), above average (7–8), and high (9–10).

**Procedure** A questionnaire (iGNiTe) was developed to obtain information from older participants about their cell phone use. It was piloted, checked, and used for data collection in 2013. In 2017, it was revised to obtain information not only about older persons' cell phone use but also about their need for services in their local communities. Statistical analysis, review of recent literature, and transdisciplinary input informed the new version of the questionnaire (we-DELIVER), which was translated into various languages and used to gather data (see Chap. 4). The internal consistency (i.e. reliability) of the subsequent data obtained was evaluated and confirmation factor analysis was conducted in an attempt to confirm the proposed factor structure (see Chap. 5 for a detailed discussed). We included a list of services that older persons are inclined to use: emergency (ambulance and police); medical (hospital and clinic); welfare (social grants); housing; public transport; child care facilities; electrical services; and stormwater drainage. The reason for including child care facilities was the large number of older individuals (mainly older women) who take care of young children (Hoffman, 2019). We were aware that not all these services fell within the mandate of local government, but it was important for us to determine the extent to which older persons had access to the range of much-needed services. Qualitative questions were formulated to support the quantitative findings and used for the semi-structured interviews and focus groups.

To collect data from the older persons, we employed a strategy of facilitated engagement with technology, whereby trained student fieldworkers, familiar with the language and sociocultural context of the older participants, collected data on smart devices into Survey Analytics (see Chap. 3; see Chap. 6 for the findings).

On the data-collection days, the gatekeeper introduced the researchers to the older participants and explained the reason for the meeting (see Chap. 4). Older participants and student fieldworkers then paired off. Student fieldworkers introduced

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[2]The reported frequency numbers may differ from the total number of participants due to missing data on certain items, thus not necessarily adding up to the total sample size of 302.

**Table 2.3** Living standard measures of participants ($n = 302$)

|  | Frequency | | Percentage |
|---|---|---|---|
| LSM score | 1 | 7 | 2.4 |
|  | 2 | 12 | 4.1 |
|  | 3 | 31 | 10.5 |
|  | 4 | 38 | 12.8 |
|  | 5 | 56 | 18.9 |
|  | 6 | 95 | 32.1 |
|  | 7 | 35 | 11.8 |
|  | 8 | 10 | 3.4 |
|  | 9 | 9 | 3.0 |
|  | 10 | 3 | 1.0 |

**Table 2.4** LSM categories of participants per area (F = frequency; % = percentage)

| Category | | LSM 1–2 | | LSM 3–4 | | LSM 5–6 | | LSM 7–8 | | LSM 9–10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | F | % | F | % | F | % | F | % | F | % |
| Area | Lokaleng | 15 | 83.3 | 52 | 78.8 | 33 | 22.8 | 1 | 2.5 | 0 | 0.0 |
|  | Ikageng | 3 | 16.7 | 5 | 7.6 | 53 | 36.6 | 25 | 62.5 | 7 | 77.8 |
|  | Sharpeville | 0 | 0.0 | 9 | 13.6 | 59 | 40.7 | 14 | 35.0 | 2 | 22.2 |

themselves to their participants and repeated the informed consent explanation to ensure inclusivity and knowledgeable consent. Older participants who were able to do so signed the informed consent form; others gave their consent orally (see Chap. 4).

**Quantitative Data Analysis** Data were analysed using statistical software packages SPSS 27 (IBM Corporation, 2021) and Mplus 8.6 (Muthén & Muthén, 1998–2021). Frequencies and valid percentages were first calculated and reported for LSM scores. LSM categories were then cross-tabulated with different areas, followed by non-parametric comparisons to identify possible significant differences per area. Lastly, LSM categories were cross-tabulated with the different services that older people are inclined to use. Missing data (a participant did not answer the question, data were captured inaccurately, or information was lost owing to system errors) were coded and excluded from the reported values.

**Qualitative Data Analysis** Data were transcribed verbatim, translated, back-translated by independent coders, anonymized and uploaded on ATLAS.ti 8. A thematic analysis framework was applied to find meaningful units of data, which were organized in themes (see Clarke & Braun, 2013). The relationships between the relevant themes and subthemes were explored and are presented in this chapter.

### 2.3.2.2 Findings

A breakdown of the different LSM groups is presented in Table 2.3, followed by the LSM scores of the three respective areas (Table 2.4).

The Kruskall-Wallis test found that LSM scores were significantly associated with the area in which older persons live [$H(4) = 116.76$, $p < 0.001$]. Step-down follow-up analysis showed that a large majority (77%) of older participants in Lokaleng reported lower levels of LSM (1–4) compared to participants in Ikageng and Sharpeville (5–8). Pairwise comparisons with adjusted $p$-values confirmed significant differences between LSM scores in Lokaleng, on the one hand, and Sharpeville ($p < 0.001$, $r = -0.60$) and Ikageng ($p < 0.001$, $r = -0.71$) on the other. No significant differences were found between LSM scores in Sharpeville and Ikageng ($p = 1.00$, $r = 0.11$). The effect size of the differences (interpreted according to Cohen, 1992) was shown to be large ($r > 0.50$), with the negative value indicating lower LSM scores in Ikageng.

The impact of a lower LSM score can be illustrated by the example of whether residents had tap water or flushing toilets inside their home. In Lokaleng ($n = 103$), only five older persons confirmed that they had running water (4.9%), compared with 62 in both Ikageng ($n = 94$; 66.0%) and Sharpeville ($n = 86$; 72.1%). In the total sample of households ($n = 302$), 66 participants (21.9%) drew hot water from a geyser.

Findings about the services that older participants accessed through cell phones (their own or by having one available when needed), are presented in Table 2.5, but most did not use their phones for this purpose.

**Inadequate Services** Older participants reported different levels of much-needed services available to them. In the rural setting, they complained about the lack of emergency services such as ambulances, as well as access to basic services such as water, safe housing, and public transport. An older Lokaleng resident was specific, saying: "We don't have ambulances" and "I need running water, a geyser, a house and accessible public transport. Those are the things that would make life satisfactory." Older recipients of services in the town of Ikageng expressed their need for services relating to good roads, safe public transport, a local community centre, local economic development (e.g. job creation), improved social security (e.g. food parcels), subsidized electricity, housing (e.g. rent), and public transport. For the most part, older residents complained about expensive services: "Rent and electricity— the rates are very high", they explained; "Electricity rates are too high for us. They don't last. We are forced to use other alternatives due to the fact that we can't afford the units (subsidies needed)" and "My problems are also related to water and sanitation and a proper toilet."

The service needs of older citizens in the town of Sharpeville were expressed in relation to economic development (jobs must be created, or a suitable community centre provided, which would enable them to meet in bad weather): "I mean what would it be like if we could receive a place and they build a centre for us? You can

**Table 2.5** Services used according to LSM categories (LSM 1–2 $n = 19$; LSM 3–4 $n = 69$; LSM 5–6 $n = 151$; LSM 7–8 $n = 45$; LSM 9–10 $n = 12$)

| Item | Category | LSM 1–2 | | LSM 3–4 | | LSM 5–6 | | LSM 7–8 | | LSM 9–10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % | F | % |
| Welfare services (social grants) | Never | 14 | 77.8 | 43 | 64.2 | 117 | 78.0 | 35 | 77,8 | 7 | 70.0 |
| | Sometimes | 0 | 0.0 | 16 | 23.9 | 25 | 16.7 | 7 | 15.6 | 1 | 10.0 |
| | Regularly | 4 | 22.2 | 8 | 11.9 | 8 | 5.3 | 3 | 6.7 | 2 | 20.0 |
| Hospital | Never | 12 | 66.7 | 46 | 68.7 | 106 | 70.7 | 27 | 60.0 | 5 | 50.0 |
| | Sometimes | 5 | 27.8 | 18 | 26.9 | 40 | 26.7 | 13 | 28.9 | 3 | 30.0 |
| | Regularly | 1 | 5,6 | 3 | 4.5 | 4 | 2.7 | 5 | 11.1 | 2 | 20.0 |
| Clinic | Never | 15 | 83.3 | 40 | 59.7 | 105 | 70.0 | 30 | 66.7 | 6 | 60.0 |
| | Sometimes | 3 | 16.7 | 19 | 28.4 | 40 | 26.7 | 10 | 22.2 | 2 | 20.0 |
| | Regularly | 0 | 0.0 | 8 | 11.9 | 5 | 3.3 | 5 | 11.1 | 2 | 20.0 |
| Ambulance | Never | 13 | 72.2 | 37 | 55.2 | 92 | 61.3 | 28 | 62.2 | 5 | 50.0 |
| | Sometimes | 4 | 22.2 | 29 | 43.3 | 51 | 34.0 | 13 | 28.9 | 4 | 40.0 |
| | Regularly | 1 | 5.6 | 1 | 1.5 | 7 | 4.7 | 4 | 8.9 | 1 | 10.0 |
| Housing | Never | 16 | 88.9 | 51 | 76.1 | 118 | 78.7 | 32 | 71.1 | 8 | 80.0 |
| | Sometimes | 2 | 11.1 | 12 | 17.9 | 22 | 14.7 | 12 | 26.7 | 1 | 10.0 |
| | Regularly | 0 | 0.0 | 4 | 6.0 | 10 | 6.7 | 1 | 2.2 | 1 | 10.0 |
| Police | Never | 13 | 72.2 | 42 | 62.7 | 92 | 61.3 | 28 | 62.2 | 5 | 50.0 |
| | Sometimes | 4 | 22,2 | 23 | 34,3 | 50 | 33.3 | 14 | 31.1 | 3 | 30.0 |
| | Regularly | 1 | 5.6 | 2 | 3.0 | 8 | 5.3 | 3 | 6.7 | 2 | 20.0 |
| Public transport | Never | 15 | 83.3 | 49 | 73.1 | 123 | 82.0 | 33 | 73.3 | 6 | 60.0 |
| | Sometimes | 2 | 11.1 | 14 | 20.9 | 20 | 13.3 | 7 | 15.6 | 2 | 20.0 |
| | Regularly | 1 | 5.6 | 4 | 6.0 | 7 | 4.7 | 5 | 11.1 | 2 | 20.0 |
| Child care facilities | Never | 14 | 77.8 | 49 | 73.1 | 128 | 85.3 | 33 | 73.3 | 7 | 70.0 |
| | Sometimes | 2 | 11.1 | 17 | 25.4 | 19 | 12.7 | 8 | 17.8 | 2 | 20.0 |
| | Regularly | 2 | 11.1 | 1 | 1.5 | 3 | 2.0 | 4 | 8.9 | 1 | 10.0 |
| Electrical services | Never | 15 | 83.3 | 48 | 71.6 | 106 | 70.7 | 31 | 68.9 | 2 | 20.0 |
| | Sometimes | 2 | 11.1 | 11 | 16.4 | 34 | 22.7 | 10 | 22.2 | 4 | 40.0 |
| | Regularly | 1 | 5.6 | 8 | 11.9 | 10 | 6.7 | 4 | 8.9 | 4 | 40.0 |
| Storm water drain-age services | Never | 17 | 94.4 | 52 | 77.6 | 127 | 84.7 | 36 | 80.0 | 7 | 70.0 |
| | Sometimes | 1 | 5.6 | 13 | 19.4 | 18 | 12.0 | 6 | 13.3 | 3 | 30.0 |
| | Regularly | 0 | 0.0 | 2 | 3.0 | 5 | 3.3 | 3 | 6.7 | 0 | 0.0 |

hear this iron roof is making such a noise." (It was raining on the day of data collection).

Services were not always delivered age-appropriately. For example, older persons were expected to walk long distances on uneven terrain to reach public transport or to access medical services: "Our clinic is quite a distance"; and "If they could just bring it closer to us". Water was available, but only from a communal tap: "[We] need water in our yards. The community taps are too far."

**Unresponsive Behaviour by Local Government Officials** Older citizens experienced local government officials as unresponsive when they reported absent or inadequate service delivery. An older person in Lokaleng explained: "We go to the municipality and complain, but they don't help with anything." In Ikageng, older persons reported that "there is a ward committee that is closer to the people [who] take the complaints of the people. And at every monthly meeting that the councillor holds, the complaints are there for the councillor to attend to." But seemingly these complaints are met without resolution: "I complain to the councillor, every time we have a meeting with him." In some instances, older persons never saw their councillors. In Sharpeville, the older recipients of services confirmed their inability to reach the authorities and experienced "no help from municipality when phoning them". The older persons in both rural and urban areas complained that trying to extract a response from local government was expensive and often futile, and offered examples: "Most of the time, they do not answer when we call, or they are too busy to help. Sometimes they say they will come, but they never do"; and "Besides, when we look for a councillor it is impossible to find one. Even if you try calling him it is difficult to find him"; and "I once put on my shoes and I went to his house. I explained to him that the older people need you there. In this new year, you need to pull up your socks and be present next to them. And then he said he is busy and will see when he gets time."

**Individual and Social Support Supplements Poor Local Government Service Delivery**
When older persons failed to obtain information or have their pressing needs for basic and municipal service delivery addressed, they resorted to visiting the local government offices. An older woman said that the only way to get their service needs addressed was to "go there [municipal offices] personally". However, for some people this was not a viable option because they suffered ill-health or lacked social support: "I ask for help because I don't have, I live on my own. That's why I ask for help from my neighbours." Consequently, older persons had to draw on support from their social networks. In rural Lokaleng, the older persons drew on an extended communal support system, under a tribal authority: "When I need information, I ask the chief or the ward councillor." They also asked their children, grandchildren, peers, and extended family, as well as people nearby, their friends, and other older persons.

## 2.4  Critical Reflections towards ICT Interventions

South African law is aligned with African regional and international guiding frameworks to promote age-inclusive communities. On the face of it, South Africa has a robust law and policy framework, applicable to municipal service delivery to all citizens, including older persons. Local government, as the state organ closest to the citizens, is best suited (and, as such, is expected) to provide contextually relevant

services that involve people meaningfully in public decision-making. It is, further-more, required to apply resources appropriately to support residents in vulnerable situations in their jurisdiction by fulfilling the presumed agreement between state and society (Kaplan, 2017). Case law also highlights the importance of local service delivery, in that courts have not hesitated to point to the service delivery duties of municipalities as, for example, in the Constitutional Court case of *Joseph v City of Johannesburg and Others* (2010 (3) BCLR 212 (CC)). In this judgment, the country's highest court found that:

> The provision of basic municipal services is a cardinal function, if not the most important function, of every municipal government. The central mandate of local government is to develop a service delivery capacity in order to meet the basic needs of all inhabitants of South Africa . . . (see par. 34).

The social contract is generally normatively—*de jure*—acknowledged in state–society relations in South Africa. When applied as an analytical and policy (non-normative) tool to concrete processes and settings where older persons are concerned, contracts are often *de facto* broken or even revoked and should be (re)negotiated. The resultant disequilibria between state and society and intra-societal relations have a detrimental effect on individuals' sense of personal coher-ence (Fournier et al., 2018) and on the broader sense of social cohesion (UNDP and NOREF, 2016).

Our research reveals that older persons with a low LSM score who live in rural communities have an urgent need for basic services. They generally reported limited access to water and electricity, poorly developed infrastructure, and age-inappropriate services. In more resourced communities such as Ikageng and Sharpeville with higher LSM scores, there were higher-level service needs. In these settings, older persons expressed needs related to the promotion of life satisfaction, which would contribute to their dignity, such as: economic development opportuni-ties, good roads, age-appropriate communal meeting venues, and a responsive local government. Our data-collection experiences as we attempted to locate relevant local government officials for information about services and programmes to older per-sons showed that it was costly to try (often in vain) to elicit appropriate responses from local government officials generally, let alone to find an official with informa-tion specific to the issue at hand. Depending on their individual circumstances, the older citizens in our study resorted to two strategies to address their service needs. First, they drew on support from social networks close by and, second, they paid their local government offices a personal visit. Not all of them, however, had a sufficient support network, financial means or agency to apply such strategies and the literature shows that, for some, the outcomes can be dire (Hoffman & Roos, 2021). NGOs play an important role in supplementing local governments' inappro-priate or failed response to older persons. Unfortunately, optimizing the benefits from NGOs is compromised by lack of communication and coordination between them and in relation to local government.

Based on the service delivery issues and the general tension in the state–society equilibria, we identified obvious systemic gaps. To partly address the dilemmas

associated with effective service delivery, we offer broad suggestions also relating to the role that technology as mediating modus could potentially play to (re)negotiate the relationship between (older) citizens and the state to address their needs as part of the state–society social contract.

## Systemic Gaps in Service Delivery

The real and perceived frustrations that older persons experience in relation to local government service delivery lie at the level of law and policy implementation. Considering that the government comprises three spheres that are interrelated and co-responsible for implementing people's rights (see 7(2) of the 1996 Constitution), it may be expected of national and provincial authorities (as well as the courts) to step in and create a safety net when municipal systems fail. This disconnect between the government sphere and service recipients has implications for everyone, but more profoundly for older persons as a marginalized group. A further consideration is the notion of contextual relevancy: people in different contexts have different service delivery needs and require different and appropriate modes of delivery, fit for their context. Even though government (any sphere) provides some services, recipients find that they must—more often than not—employ their own complementary solutions to access the services they need. The difficulties for those challenged with limited resources, support structures or mobility are obvious.

## Interventions towards Service Delivery

To address the systemic lag in service delivery, we list three possible interventions. We focus on the use of technology, reflecting the aim of this volume.

1. On a policy and organizational level, local municipalities can (re)establish a dedicated unit focusing on age-inclusive communities in line with the World Health Organization's Age-Friendly Programme (WHO, 2007). Such a unit can assess older persons' context-specific needs and identify appropriate modes of delivery to design and implement tailor-made, sustainable programmes, affordable services, and interventions to equip older persons with the knowledge and skills needed to promote ageing well. Infrastructure can be refurbished to accommodate the functional needs of older persons, such as dedicated service counters and allocated parking spaces, and accessible and safe public transport can be made available.

2. On an advocacy level, the participation of older individuals could be enabled through associations and organizations, or mechanisms for their institutional representation. Establishing a platform 'to speak with one voice' can help both to define the specific needs of this group and to limit duplication of services and develop the optimal use of limited resources. Discussion forums at community, ward or municipal level that are accessible to older persons or their representatives are effective ways for them to raise issues affecting their lives and thereby to improve accountable service delivery. Municipal service partnerships involving community-based organizations and community development workers can also make services more accessible to older individuals.

3. To address gaps in (effective) service delivery in ways that meet the needs of marginalized groups (and beyond), and to explore the as yet untapped potential offered by ICT, it is imperative to draw on the agency of affected groups. We suggest that ICT offers the potential to do just that for older persons who seek effective municipal service delivery: it provides access to information as well as swift communication and feedback opportunities to keep local government accountable.

## 2.5   Conclusion

This chapter highlights the disconnect between the vision and stipulations of international, African regional and South African law and policy for municipal service delivery and the daily service delivery experience of local government officials and by older recipients (as a marginalized group in society). Our findings underscore the depth of the implementation deficit in South Africa; its impact is tangible and gives cause for concern—it frustrates efforts to improve the well-being and socio-economic development of older persons, and it thwarts the ideal of inclusivity in municipalities.

Systemic problems in local government cannot realistically be fixed overnight. Those responsible for steering municipal service delivery could, however, find it helpful to draw on a promising and progressive law and policy base as well as on the growth and uptake of technology by older people. We therefore advance the argument to consider alternative means to improve access to information about and participation in municipal service delivery by older persons as active agents. One solution would be to use ICT to promote effective communication and processes that make it possible for older persons to access information about services and provide new opportunities for them to give input and feedback.

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# Chapter 3
# Older South Africans' Access to Service Delivery through Technology: A Process Overview

**Vera Roos**

**Abstract**  This chapter introduces a process designed to support older individuals' inclusion in technology and access to information. This process informed the development and dissemination of our technology artefact for providing information about local services to older South Africans. But essential baseline data of their cell phone use was lacking. In 2014, for the first self-funded study iGNiTe: Older Individuals' Cell Phone Use and Intra/Intergenerational Networks, a questionnaire and qualitative interview questions were developed. Student fieldworkers were trained to obtain information and facilitate older individuals' engagement with technology. Older participants ($n = 128$) completed the questionnaire, and qualitative data came from 52 participants. In 2017, we obtained funding and launched a second, broader project we-DELIVER: Holistic service delivery to older people by local government through ICTs—with its own logical framework. Older participants across research settings responded to a revised questionnaire ($n = 302$) and provided qualitative data, and student fieldworkers ($n = 160$) reflected on their interactions with the participants. The findings from both data-collection initiatives informed the development of the Yabelana ('sharing of information') ICT ecosystem (website, app and Unstructured supplementary service data code [USSD]), which was disseminated to older participants and stakeholders in a workshop and policy brief.

**Keywords**  Cell phone technology · Facilitation strategies · Research process · Social engagement · Technology artefact · Older south Africans · Yabelana ICT ecosystem

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## 3.1 Introduction

This chapter is set in the context of purposely stimulating the inclusion of older adults in all life domains, including technology (Annan, 1998; UNDP, 2018). Even though the inclusion of older persons is receiving attention internationally (Keating et al., 2021), the particular concern in a country such as South Africa is that older individuals' interests are often disregarded as a priority because pressing social issues demand attention, as does the allocation of resources in redressing the unequal inheritances of a pre-1994 society, combating poverty, and dealing with the staggering impact of high youth unemployment (see Chap. 1; Westoby & Botes, 2020). Older South Africans' proper inclusion in technology to access information and services frequently lags behind for various reasons but mostly because a basic understanding of how they use cell phone technology is underreported. To this end, we have made a concerted effort to gather information about older individuals' cell phone use and to identify the social systems facilitating their use, not only for the purposes of designing and developing an appropriate technology artefact, but also beyond the aim of this book.

This book is based on the view that technology is a feasible option for enabling older persons to access service information. Some attempts have been made to propose cell phone design guidelines for older persons to foster significant uptake of technology in South Africa (Van Biljon & Renaud, 2016), and to identify challenges inhibiting their cell phone access and use (Van Biljon et al., 2013). Local studies have engaged older individuals in the design of technologies to support their health and well-being (Du Preez & De La Harpe, 2019). The few available qualitative studies of older South Africans' subjective experiences of technology (cell phones, specifically) have revealed that they believe they lack the relevant basic skills and knowledge, and that they are hesitant about using cell phones (Steyn et al., 2018). Older persons' perceived level of competence with such a device varies according to the complexity of the phone and its features, which limits their use (Leburu et al., 2018). They rely on assistance from others, particularly younger people, who are emotionally close and within reach, who have technical expertise, and who help older individuals unconditionally (Leburu et al., 2018; Roos & Robertson, 2019; Scholtz, 2015). Research has shown that older persons use cell phones to promote their personal safety and sense of control, to manage their daily routines, and stay connected with loved ones (Lamont et al., 2017; Steyn et al., 2018). They creatively apply relational strategies for using cell phones and navigating the social environment to address their needs.

The process followed to develop a technology artefact aimed at enabling older individuals' access to information is summarized in Fig. 3.1.
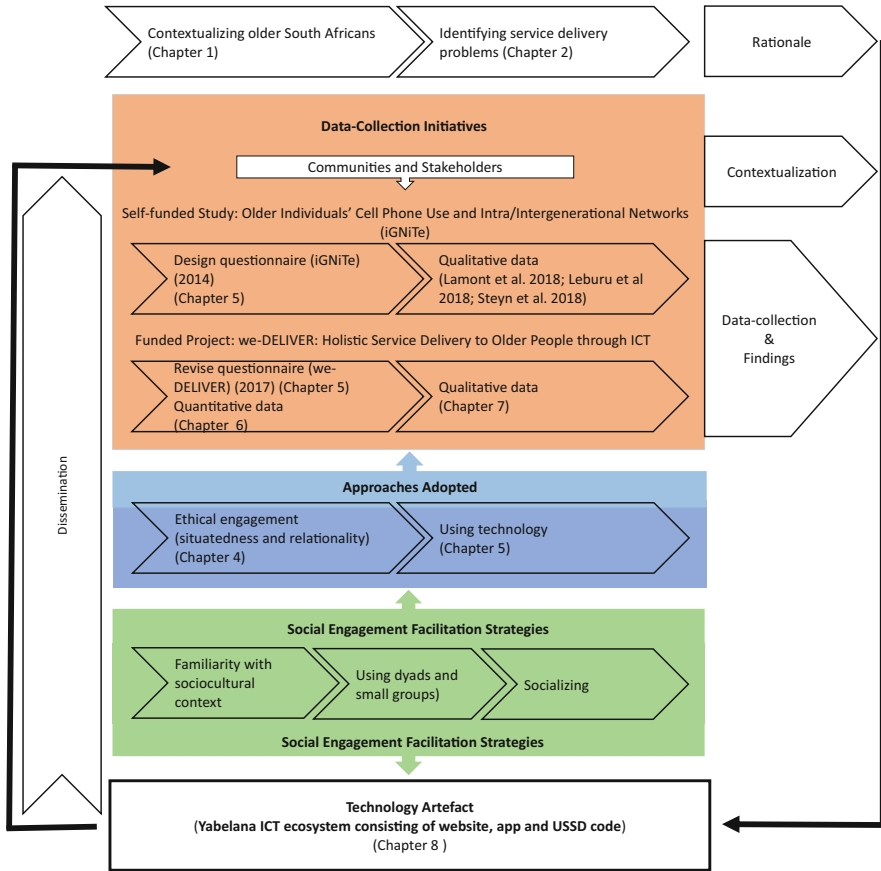
**Fig. 3.1** Processes followed to develop the Yabelana technology artefact to enhance older individuals' access to service information

## 3.2 The Research Journey

The research journey was informed by the rationale for the development of the artefact; contextualization of the cohort of older individuals in the selected research communities and the participants' situatedness in multigenerational families; and findings obtained from two data-collection initiatives. We adopted two key approaches to obtain findings that would guide the development of the artefact; and we employed social engagement facilitation strategies to support older persons' optimal use of the technology and to disseminate it.

**Rationale** Chaps. 1 and 2 provided reasons for developing a technology artefact as a means to promote older South Africans' access to service delivery. Chap. 1 positioned older individuals globally and within the southern African context. Chap. 2 identified service delivery problems against relevant legislative frameworks

and concluded that technology could play an important role in enhancing older individuals' access to services. Services are important because they provide opportunities for a decent life (Kelly & Westoby, 2018).

**Contextualization** The lack of information about older persons' cell phone use motivated our research initiatives to collect baseline data. We obtained data from older participants in four communities, ranging from rural to urban, and we invited relevant stakeholders involved with service delivery to older individuals.

**Data Collection and Findings** We started gathering information about older South Africans' cell phone use in 2014 through a self-funded study (iGNiTe), which gave us the opportunity to develop a questionnaire and draw up qualitative questions for semi-structured interviews and focus groups. In 2017, with funding from the Tirelo Bosha programme―a public service improvement programme and partnership between South Africa's Department of Public Service and Administration (DPSA) and the Belgian Development Agency―we embarked on a larger-scale community-based project, entitled we-DELIVER: Holistic service delivery to older people by local government through ICT. The development of the iGNiTe and we-DELIVER questionnaires is discussed in Chap. 5. The findings of the quantitative analysis are presented in Chap. 6. We used insights obtained from student fieldworkers' reflections and their participation in focus groups, with the data obtained from the older participants, to make recommendations for intergenerational programmes involving older and younger people in formal contexts in the public domain. The findings of this qualitative analysis are presented in Chap. 7.

**Approaches Adopted** We adopted two main approaches to drive the development of the Yabelana ecosystem. The first was ethical engagement, guided by two heuristics constructs to direct our ethical conduct—situatedness and relationality. Chap. 4 presents details of the phases followed and associated ethical actions in relation to the research team members themselves (researchers and student fieldworkers) and their interactions with older participants. The second approach was to use technology, with the facilitation of student fieldworkers, to collect and capture data from older participants about their cell phone use. A detailed discussion is presented in sect. 3.6 of this chapter and in Chap. 5.

**Technology Artefact** The rationale, contextualization and findings of the two data-collection initiatives informed the design and development of the Yabelana ICT ecosystem, consisting of a website, app and USSD code, presented in Chap. 8.

**Social Engagement Facilitation Strategies** We employed three strategies in the data collection and dissemination of the technology artefact: familiarity with socio-cultural context; using dyads and small groups; and socializing. These are discussed in further detail in sect. 3.7 of this chapter.

**Dissemination** The Yabelana app and USSD code were introduced to older participants from the same communities who had participated in the we-DELIVER data collection, drawing on the same social engagement facilitation strategies. We invited representatives of the service delivery stakeholders to an experiential workshop and developed a policy brief.

## 3.3   Data-Collection Initiatives

The 2014 iGNiTe and the 2017 we-DELIVER data-collection initiatives used a context-specific approach towards the communities selected for the research as well as towards the stakeholders involved in delivering services to older individuals. We first describe the context, and then the two initiatives in turn.

### 3.3.1   Communities and Stakeholders in Context

Five communities in all (Potchefstroom, Promosa, Ikageng, Lokaleng and Sharpeville) that included rural and urban contexts, were the settings for the two data-collection initiatives. A rural setting refers here to a settlement that is not connected to a town or city, is sparsely populated and under traditional leadership. The urban settings represent large towns with higher-density developments near city centres or on the urban periphery (Department of Cooperative Governance and Traditional Affairs, 2016).

#### 3.3.1.1   Communities

The iGNiTe study included communities (Potchefstroom, Promosa and Ikageng) near the researchers and thus easily accessible. Three day-care settings[1] for older persons in the large town of Potchefstroom (120 km southwest of Johannesburg) in South Africa's North West province were purposively selected (see map in Fig. 3.2) for this first study.

The we-DELIVER project offered a broader scope. Owing to the time-limit of 18 months set by the funders to complete the study, three communities with existing links to the North-West University's three campuses were purposively selected (see Preface): Lokaleng (Mahikeng Campus), Ikageng (Potchefstroom Campus), and Sharpeville (Vanderbijlpark Campus). They are situated in two provinces: Lokaleng, a rural setting, and Ikageng, a large town, are in North West, and Sharpeville, also a large town, is in Gauteng (see map in Fig. 3.2).

**Population Composition and Household Income** We extracted information about the older South Africans' profile in relation to multigenerational households (HHs) for the five communities from national data (Stats SA, 2011): Potchefstroom, Promosa, and Ikageng (the locations of the iGNiTe study) and Lokaleng, Ikageng, and Sharpeville (the locations of the we-DELIVER project). The population composition and household income of the five research communities in the two data-collection initiatives are presented in Table 3.1. For the purpose of the multigenerational household structure, the population composition indicates people

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[1]Potchefstroom Service Centre for the Aged, Promosa Service Centre, and Ikageng Old Age centre.
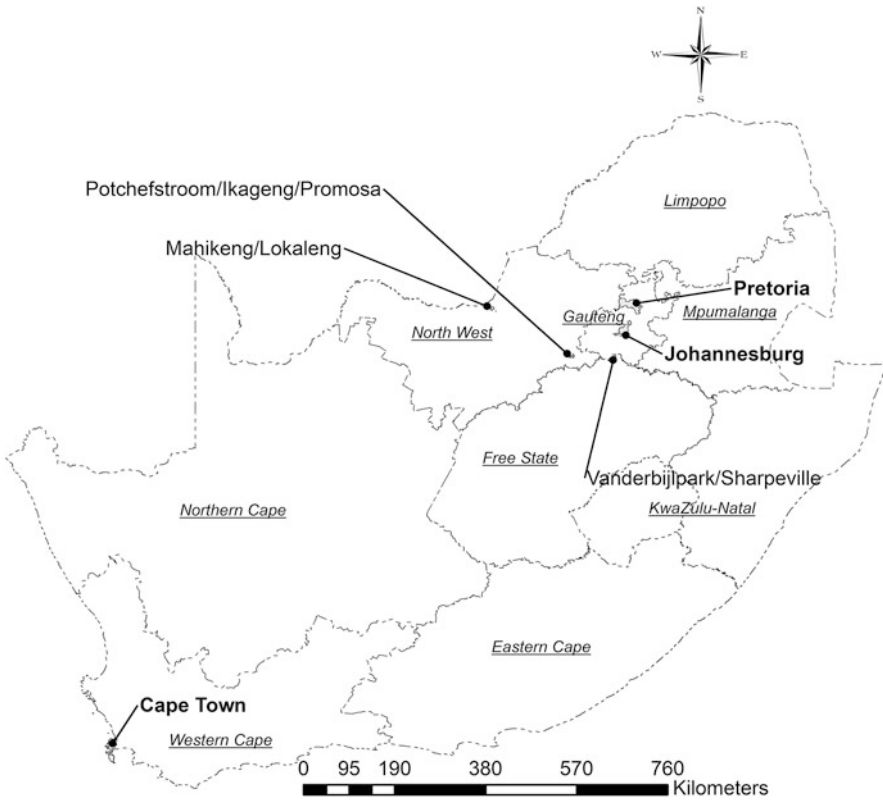
**Fig. 3.2** Map of South Africa indicating the location of the five communities (Potchefstroom, Promosa, Ikageng, Lokaleng and Sharpeville) taking part in the community-based data-collection initiatives (iGNiTe and we-DELIVER)

aged 65 years[2] and older and 14 years and younger. Household income includes the total number of households with no or low (less than R3,183 per month) income, and the 65 and older proportion of the households with no or low income. Population composition and household structure are presented in Table 3.2. It shows the male-female distributions of households, average number of people per household, and the number of households headed by people 65 years and older.

**Multigenerational Household Trends** The following trends are discussed as contextualization of the multigenerational household composition of the respective communities.

– Potchefstroom: Of the population aged 15–64 years, 30% were aged 19–23 years because the town includes the Potchefstroom campus of the North-West University. In HHs with eight or more persons, people aged 65 years and older headed

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[2] See footnote 2 in Preface on pg 5.

**Table 3.1** Population composition and household income of research communities (Stats SA, 2011)

| Community | Population composition [% of total population composition] | | | Household income [% of total households] | | | |
|---|---|---|---|---|---|---|---|
| | Total population of the community | People 65 years and older | 14 years and younger | Total no of Households | No income | Income less than *R3,183 per month (including no income) | 65+ proportion of income less than R3,183 |
| Potchefstroom | 43,443 | 9% (n = 3975) | 15% (n = 6708) | 17,370 | 26% (n = 4539) | 47% (n = 8229) | 13% (n = 1053) |
| Promosa | 16,122 | 4% (n = 561) | 31% (n = 4941) | 4194 | 14% (n = 564) | 61% (n = 2550) | 11% (n = 270) |
| Ikageng | 87,699 | 5% (n = 3921) | 29% (n = 25,395) | 26,250 | 14% (n = 3762) | 67% (n = 17,502) | 11% (n = 1974) |
| Lokaleng | 2661 | 5% (n = 120) | 34% (n = 906) | 711 | 16% (n = 114) | 90% (n = 642) | 14% (n = 87) |
| Sharpeville | 37,602 | 8% (n = 2793) | 24% (n = 8763) | 12,162 | 17% (n = 2070) | 69% (n = 8421) | 19% (n = 1626) |

* R3,183 per month was the maximum cut-off for the bracket to qualify for a means-tested old age grant for a single person in 2011. (The value in 2011 was US$ 0.138)

% Percentages have been rounded up

**Table 3.2** Population composition and household structure of research communities (Stats SA, 2011)

| Community | Population composition | | Household (HH) structure | | |
|---|---|---|---|---|---|
| | Total population of the community | Male [female] distribution | No. of HHs | Average no. of people per HH | No. of 65+ headed HHs |
| Potchefstroom | 43,443 | 48% (n = 20,901) to [52% (n = 22,542)] | 17,370 | 2.5 | 2235 (13%) |
| Promosa | 16,122 | 49% (n = 7854) to [51% (n = 8268)] | 4194 | 3.8 | 375 (9%) |
| Ikageng | 87,699 | 49% (n = 42,555) to [51% (n = 45,144)] | 26,250 | 3.3 | 3138 (12%) |
| Lokaleng | 2661 | 52% (n = 1386) to [48% (n = 1278)] | 711 | 3.7 | 90 (13%) |
| Sharpeville | 37,602 | 49% (n = 18,588) to [51% (n = 19,014)] | 12,162 | 3.1 | 2319 (19%) |

three out of a total of 72 (4%) households. The 65 years and older group headed 5% (n = 60) of the HHs comprising 5–7 members. In Potchefstroom there were 738 HHs headed by a grandparent or a great-grandparent; that is, 4% multigenerational households of all the HHs in the community. Of these, 87% (n = 642) included children aged 0–19 years.

– Promosa: There were 231 (6%) multigenerational HHs headed by a grandparent or a great-grandparent, including 147 (64%) children aged 0–19 years. In Promosa there was an over-representation of multigenerational HHs in which people 65 years and older headed 19% (n = 36), with eight or more persons. The 65 years and older group headed 9% (n = 81) of HHs with 5–7 members.

– Ikageng: If HHs with 8 or more persons are considered, we note that an over-representation of people 65 years and older headed 29% these; they also headed 17% of HHs with 5–7 members. Since this cohort represented 12% of the population of HH heads, it is clear that multigenerational households were more likely to be headed by individuals aged 65+ years. In Ikageng 1080 (4%) HHs were headed by a grandparent or a great-grandparent, including 609 (56%) children aged 0–19 years.

– Lokaleng: 90 (13%) of all the HHs in Lokaleng were headed by people 65 years and older. People aged 65 years and older headed 12% of HHs consisting of eight or more persons, and 11% of HHs with between 5–7 members. In Lokaleng 60 (8%) multigenerational HHs including 42 (70%) children aged 0–19 years are headed by a grandparent or a great-grandparent,

– Sharpeville: In HHs with eight or more persons, 43% were headed by people 65 years and older. Individuals in this age group also headed 28% of HHs with 5–7 members. This cohort (65+) represented 19% of the total population

household heads and therefore clearly over-represented multigenerational-headed households. In Sharpeville 378 (3%) HHs were headed by a grandparent or a great-grandparent; of these, 40% ($n = 150$) included children aged 0–19 years.

### 3.3.1.2 Stakeholders

We identified three non-academic stakeholders relevant to promoting older individuals' access to information and services: the South African Local Government Association (SALGA) (https://www.salga.org.za/), Age-in-Action, and South Africa's DPSA.

– SALGA is an independent association of municipalities whose mandate derives from South Africa's Constitution. One of its main aims is to assist municipalities with policy guidelines in areas of community and human development. SALGA strives to determine how people's different developmental stages are accommodated within the services and programmes that municipalities deliver, and to sensitize local governments to the limitations that certain age groups face—in this instance, older persons. We anticipated that SALGA's involvement in our project could have a multiplier effect potentially, over time, influencing all local governments in the country's nine provinces to use communications technology in promoting older individuals' access to service-related information.
– Age-in-Action is the largest NGO in South Africa that deals with the affairs of older individuals. It promotes the status, well-being, safety, and security of older persons, provides community-based care, and lobbies for older persons' rights (http://www.age-in-action.co.za/).
– The DPSA seeks to contribute to improving public administration and public service delivery through programmes, systems, frameworks, and research (http://www.dpsa.gov.za/about.php).

## 3.4 Self-Funded Study (2014)—iGNiTe: Older Individuals' Cell Phone Use and Intra/Intergenerational Networks

The aim of this self-funded study was to design a new questionnaire for obtaining baseline data specifically about older individuals' cell phone use; this information could subsequently be employed to monitor future cell phone use, and to customize ways to facilitate older participants' engagement with technology. We used three data-collection methods, including visual data to obtain in-depth knowledge about older persons' subjective experiences of using cell phones, and about any inter/intragenerational involvement in their use of the technology. For this purpose we developed qualitative interview questions.

### 3.4.1 Questionnaire

We designed the questionnaire relating to older persons' cell phone use in sections that provided biographical and demographic data; information related to cell phone access, cell phone feature use, and competence to use a cell phone; and information about social networks pertinent to older persons' cell phone use. Younger student fieldworkers administered the questionnaires, using technology as a method of application (see further discussion in sect. 3.6 below). The assessment of this questionnaire's psychometric properties is discussed in Chap. 5.

### 3.4.2 Qualitative Data-Collection Methods

Three methods were used: semi-structured interviews, focus groups, and the Mmogo-method® for data collection based on visuals (Roos, 2008, 2012, 2016). Questions were formulated (see Box 3.1) for use both in the interviews and focus groups, to explore the subjective experiences of older persons in their intra/intergenerational interactions involving cell phone use.

> **Box 3.1  Questions for interviews and focus groups**
> – What do you do with a cell phone?
> – Can you explain what role the cell phone plays in your relationships?
> – Whom do you ask for help when you struggle with your phone?
> – Why do you ask that specific person?
> – How did you experience the interaction when you asked for help?

The Mmogo-method® was employed to obtain the participants' experiences specifically in relation to their cell phone use (Roos, 2008, 2012, 2016). The method is applicable across different sociocultural contexts (Puren & Roos, 2016) in four phases. Phase 1 consists of creating a clear context for the research, to clarify the research process and researchers' expectations of participants, and to create a safe interpersonal space before introducing the research activities. We demonstrated empathy for the participants by recognizing that the research setting was unfamiliar as was using materials to visually express abstract experiences. We assured participants that their visual images or responses would be accepted unconditionally and emphasized voluntary participation and withdrawal from the research at any time they wanted to. In Phase 2, participants receive unstructured materials—such as malleable clay, beads of different colours and sizes, and dried grass stalks—and are asked to use the materials to construct visual representations. The open-ended prompt that we used in our project to stimulate the visual constructions was: "Please use the materials and make anything when thinking of your cell phone." Participants completed their visual presentations in about 35 minutes. In Phase 3, participants are
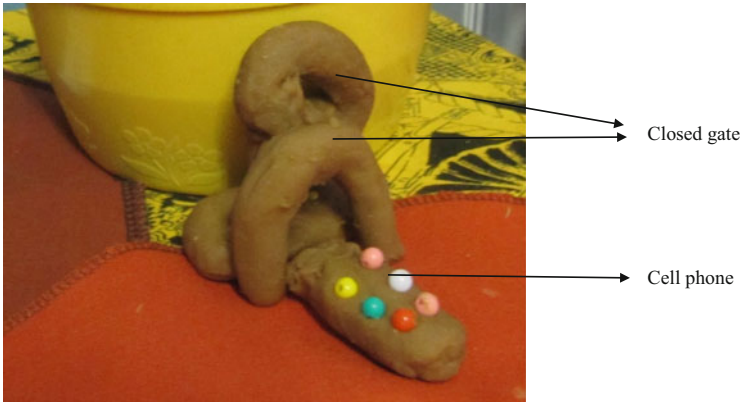
**Fig. 3.3** A visual representation depicting a cell phone and a closed gate

asked questions about the visual representations they have constructed. Phase 4 serves as a debriefing session for participants and researchers to exchange their experiences of participating in the data-collection method on the specific topic. In our study, it took place when the older participants and student fieldworkers enjoyed refreshments together and the fieldworkers offered support, if the participants needed it, to deal with any emotional reactions prompted by their engagement in the research.

The visual images were photographed to record the visual data, and individual and group discussions were transcribed for analysis as textual data. An example of an older woman's visual representation is shown in Fig. 3.3. She had constructed a cell phone in relation to her desire to obtain an appropriate response to a need; she explained: "If you find the gates at home are locked, you can phone people inside the house to open the gate for you" (Ikageng, Participant 4).

### 3.4.3   Older Individuals' Participation

The three data-collection methods used in iGNiTe yielded qualitative data from 52 older individuals: some participated by means of semi-structured interviews ($n = 23$), others through focus groups ($n = 10$), and a third group through the Mmogo-method® ($n = 19$). The questionnaires yielded quantitative data from older individuals ($n = 128$) with higher living-standard levels (see Chap. 6), explained partly by the fact that, on the day of data collection, some potential participants were prevented from attending the events owing to transport problems and child care responsibilities.

## 3.5 Funded Project (2017): we-DELIVER: Holistic Service Delivery to Older People by Local Government through ICT

With funding secured, this community-based project was initiated to expand the data on older individuals' cell phone use and their service needs. The university provided an institution from which researchers in different subject disciplines could be recruited as well as a diverse group of student fieldworkers familiar with the different sociocultural contexts of the older persons in the targeted communities. The trans-disciplinary research team consisted of researchers and student fieldworkers from disciplines that included demography and population studies, development studies, social work, psychology, language studies, law and public administration, biokinetics, and information systems. Such diversity benefits community-based research because it provides different subject disciplinary perspectives (see Tebes et al., 2014). In our study, it benefited the development of context-sensitive questionnaires, access to the different communities, and the older participants themselves. A logical framework consisting of an overall goal, specific objectives and activities, and verifiable indicators and assumptions guided the implementation of the we-DELIVER project (for details, see Table 3.3).

### 3.5.1 Revised Questionnaire

We revised and updated the earlier iGNiTe questionnaire to obtain baseline data of older individuals across a range of deprived rural settings as well as more urbanized and better resourced ones. The new questionnaire included the following sections relating to the participants and their cell phone use: biographical information, living standards, information related to the type of device used and connectivity, ability to use cell phone features, social and healthcare needs, relationships with those around them regarding cell phone use, and the level of participants' self-perceived competence with cell phones (knowledge, skills, and attitude). A section on specific local service delivery needs was also included. Chap. 5 presents detail of the investigations into the questionnaire's psychometric properties.

### 3.5.2 Qualitative Data

Qualitative questions were formulated for use in the semi-structured interviews and focus groups to address the goals of the we-DELIVER project (see Box 3.2).

**Table 3.3** Logical Framework for the we-DELIVER Project

| Project Title | we-DELIVER: Holistic service delivery to older people by local government through ICTs | | |
|---|---|---|---|
| | Rationale | Verifiable indicators | Assumptions |
| Main goal | Develop an ICT artefact to capture service and resource information that is appropriate for older persons in their local contexts | Artefact is designed and developed with relevant information for older persons (but not limited to them) in their local contexts | – Older persons use the artefact<br>– Local government adopts the artefact<br>– Relevant skills and expertise are available in the NWU transdisciplinary team |
| Specific objective (s) | 1) Identify older persons' cell phone use, care and social service needs, and local service providers | – Baseline data of older persons' cell phone use is available<br>– Older persons' care and social needs in local contexts are listed<br>– Service providers are identified and details specified | – Suitable questionnaire is available for collecting data about older persons' cell phone use and needs for services<br>– Student fieldworkers are available and willing to participate in a community-based project<br>– Service providers' information is available and updated |
| | 2) Develop an appropriate ICT artefact with relevant context-specific information about services, in collaboration with a project steering committee (PSC) | – An artefact is designed<br>– Service providers are listed<br>– A PSC oversees project implementation in context and culturally-sensitive manner | – Design skills are available in the transdisciplinary NWU research team<br>– Service providers' information is available on a search engine, including Google<br>– Researchers and student fieldworkers (and older representatives) are willing to act as a PSC |
| | 3) Deploy and revise artefact | Artefact is released to:<br>– older recipients in local communities<br>– stakeholders (e.g. local government, SALGA, NGOs, DPSA)<br>– scientific audience | – Community members (including older individuals) use the app and USSD code and give feedback<br>– SALGA disseminates the artefact to other local municipalities for implementation<br>– Major publisher accepts manuscript for publication of a book on the project |

(continued)

**Table 3.3** (continued)

| Project Title | we-DELIVER: Holistic service delivery to older people by local government through ICTs | | |
|---|---|---|---|
| | 4) Find suitable custodian for artefact | Custody of the artefact is transferred to suitable custodian | Local government/academic institution acts as custodian of the artefact |
| Activities | Meet with stakeholders and role players | – Researchers across the three NWU campuses attend meetings to discuss project participation<br>– SALGA and Age-in-Action confirm their support for the project | – Researchers across the three NWU campuses are willing and available to participate in the project<br>– SALGA and Age-in-Action are willing to support the project |
| | Obtain ethical clearance | Ethical clearance is obtained from an appropriate NWU ethics committee | Ethics proposal is prepared according to guidelines to ensure timely approval |
| | Identify communities and older individuals with varying living standards in collaboration with the PSC | – A PSC has been established<br>– Three communities are identified<br>– Strategies for recruiting and sampling older individuals are finalized | – PSC recommends suitable criteria to identify communities and older participants (limited time frame for project)<br>– Researchers at the three NWU campuses have confirmed links with communities<br>– Gatekeepers in respective communities give permission for research and mediate access to older participants<br>– Local municipalities are willing to participate, following an invitation extended by SALGA |
| | Collect and analyse baseline data of older individuals' cell phone use and their care and service needs | – The we-DELIVER questionnaire is translated into the vernaculars spoken by the older individuals in the three communities<br>– Questions for semi-structured interviews and focus groups are formulated<br>– Student fieldworkers are trained<br>– Older participants attended data-collection events | – An existing questionnaire (iGNiTe) is revised for the purpose of the we-DELIVER project<br>– Research team's expertise to translate the questionnaire is confirmed<br>– Interview questions are appropriate for yielding rich data<br>– Students respond to invitation to participate in the training and collection of data from older individuals |

**Table 3.3** (continued)

| Project Title | we-DELIVER: Holistic service delivery to older people by local government through ICTs | | |
|---|---|---|---|
| | | – Baseline data are available for development of artefact<br>– Older persons' care and social needs are listed to identify relevant service providers' information | – Older individuals are willing to participate<br>– Quantitative and qualitative data are analysed and results are provided<br>– List of service providers' information is complete |
| | Develop user-friendly artefact and populate with context-specific information | – Artefact (consisting of a website, app and USSD code) is designed and branded<br>– App is available on Google play store or apple app store<br>– Service providers are listed in relation to:<br>• Current services and resources for older people in the research communities<br>• Nature of services and location<br>• Contact details | – Research team has relevant skills to design and develop artefact<br>– The app is approved by Google and apple and uploaded in app stores, USSD code is available, and website is functioning<br>– Service providers' information is available and updated for local contexts |
| | Deploy app and USSD code in the three pilot communities | – App and USSD code are introduced to older persons in Lokaleng, Ikageng and Sharpeville | – Artefact accommodates older generation and smart phones<br>– Older individuals are able to use the artefact through facilitation by younger people<br>– Student fieldworkers are willing and able to facilitate older persons' use of technology |
| | Obtain feedback from app users and propose recommendations for improved use | – Feedback from older users and student fieldworkers is recorded verbatim<br>– Artefact designer revises the app to improve use | – Feedback from app users is obtained verbatim after introduction of the artefact<br>– Software developers are willing and able to make revisions to improve use |
| | Disseminate information about process of obtaining baseline data on older persons' cell phone use and designing and developing an artefact with | – Local government officials attend workshops facilitated by SALGA<br>– Policy brief is drawn up<br>– Peer-reviewed publication is prepared and published | – SALGA introduces local government officials to the artefact through experiential workshops<br>– DPSA adopts a policy brief to inform local |

(continued)

**Table 3.3** (continued)

| Project Title | we-DELIVER: Holistic service delivery to older people by local government through ICTs | | |
|---|---|---|---|
| | context-specific information | | government's service delivery to older individuals<br>– Publisher accepts manuscript for publication of a book on the project |
| | Transfer to suitable custodian | Local government/academic institution host the app and website | Local government officials/researchers monitor activity on the site, using Google analytics, and populate ICTs with appropriate information |

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**Box 3.2  Questions for Interviews and Focus Groups**
**Cell Phones and Intra/Intergenerational Relations**

– Do you have access to a mobile phone?
– If yes, ask: do you own the phone, or does it belong to someone else?
– If it belongs to someone else, ask: to whom does it belong?
– Are you using the phone yourself?
– If someone is helping, ask:

  • Why do you ask that person to help you?
  • What do you ask them to help you with?
  • If asking for help from someone, determine if assistance is required in terms of the phone usage or in terms of challenges (physical, skills, knowledge?)
  • What kind of help do you ask for?
  • What kind of help do they give you?

– If you struggle with the phone and don't ask for help, can you explain why?

**Older Persons' Service Needs**

– As an older person, what kind of services do you need in order to live happily and well?
– Where do you currently find the information/services you need?
– Who provides these services?
– If you need information, whom do you ask/call?
– If your friend or neighbour asks you for information about issues regarding older persons, whom would you refer them to?

> **Box 3.2** (continued)
> – Do you ever use the phone to call the municipality to get information about things you need?
> – Does anybody else in your household use the phone to get information from the municipality about things you need?
>
> **Which of the following services do you need/use?**
>
> – Welfare services (social grants): specific grants the older person has access to, e.g. old age pension, child support grant, foster care grant, disability grant.
> – Municipal/provincial/national health services; housing; police; public transport; child care facilities; electric services; storm water services; ambulance services; cultural matters; funeral parlours and cemeteries; municipal roads; refuse removal; street lighting.

### 3.5.3 Older Individuals' Participation

Older individuals ($n = 302$) completed the questionnaire and results are reported in Chap. 6. For qualitative data collection, 198 people participated in focus groups ($n = 22$) and semi-structured interviews (14). The qualitative findings related to intra/intergenerational relations around older individuals and cell phones are reported in Chap. 7. Information about older individuals' service needs was used to create the categories of service providers listed in the database of the technology artefact (see Chap. 8).

## 3.6 Approaches Adopted

Two approaches guided our data collection: ethical engagement and the use of technology for data capturing. Ethical engagement (discussed in Chap. 4) drew on two heuristic constructs, situatedness and relationality, and was applied in relation to the researchers, the student fieldworkers, and the participants. The present discussion focuses on the second approach, the use of technology in the data-collection process.

Technology was deliberately used during data collection to facilitate older individuals' engagement. Before data collection commenced, we uploaded questionnaires on the cell phones of the student fieldworkers or on other mobile devices (Fig.3.4). Having established a relational connection with the participants (see Chap. 7 for details of the specific strategies applied), the fieldworkers invited the participants to respond to the questionnaire. Sitting close to one another, the participants could observe both the questions and how the student fieldworkers captured the responses on their mobile devices (see Fig. 3.5 and Fig. 3.6).

**Fig. 3.4** Student fieldworkers learn to navigate the questionnaire on a mobile device

Because the fieldworkers knew how the questionnaire worked and how to use a mobile device, they used the technology to capture the older individuals' responses accurately and efficiently, thereby limiting the time needed to complete the questionnaire, preventing potential participation fatigue, and modelling behaviour of comfortably engaging with technology.

## 3.7   Social Engagement Facilitation Strategies

The priority for the community-based project was: safe connections first before conducting research or using technology. We realized that for this particular cohort of older participants research was a most unfamiliar activity and involving them in topics related to their cell phone use or introducing a technology artefact could be perceived as threatening. According to Van der Kolk (2014), feeling unsafe causes people to seek social engagement to get help, support and comfort; it is in the interpersonal space that we send and search for cues of safety (Dana, 2018). Connecting safely to other people is not only fundamental to meaningful lives (see Van der Kolk, 2014) but also relevant when conducting research and introducing technology to a cohort of older individuals for whom both could be perceived as risky. The social engagement facilitation strategies used included drawing on the fieldworkers' familiarity with the participants' sociocultural context, working together in dyads and small groups, and socializing.

**Fig. 3.5** A younger person captures an older participant's responses on his cell phone in Potchefstroom





**Fig. 3.6** Student fieldworkers record older women's responses in Lokaleng

### 3.7.1 Familiarity with Sociocultural Context

We assumed that involving older individuals in a familiar relational context would contribute to feelings of safety in interpersonal interaction: it opens up the space for optimal engagement between people and reduces anxiety and reactivity (Levine, 2010; Porges, 2011).

We applied this facilitation strategy as follows: on the data-collection day, an older person or student fieldworkers who spoke the same vernacular as the older persons welcomed the older participants, introduced the event, and explained their involvement (Fig. 3.7). Student fieldworkers also familiar with the vernacular of the participants then captured their responses on mobile devices. Having a language in common acts as a proxy for sharing the same sociocultural context. We assumed that, in a familiar sociocultural context, a pre-existing cultural relationship between the participating older individuals and the younger student fieldworkers would be activated and that the interaction would progress according to the standard of behaviour established by the community's culture (see Edwards, 2009; Hamington, 2010; Kaplan et al., 2017). According to principles of social constructionism, people learn to use symbols through the socialization process which "allow for smooth and effective interpersonal, intergroup, and intercultural communication" (Quist-Adade, 2019, p. 3). Therefore, involving older and younger people with shared knowledge



**Fig. 3.7** An older woman introduces the project to participants in Sharpeville

of the sociocultural context in our project contributed to making the collaboration productive and to generating a shared understanding of ideas (see Damşa, 2014).

### 3.7.2  Dyads and Small Groups

Older participants and student fieldworkers paired off (Fig. 3.8) and in these dyads the fieldworkers engaged with the older individuals to obtain information about their cell phone use.

Later, the fieldworkers also engaged with small groups of older individuals to introduce the technology artefact, the Yabelana app and USSD code (Fig. 3.9) after it had been developed. Small groups more optimally promote participation according to Kelly and Westoby (2018). In our study, interactions in dyads and small groups took place after the student fieldworkers had created a warm inviting interpersonal context (see Chap. 7). The assumption guiding this social engagement strategy was that knowledge creation and meaning making are embedded in the mechanism of communicative interactional encounters with others, for example through dialogue, shared discourse, and conversational encounters (Damşa, 2014).

### 3.7.3  Socializing

On completion of data collection, the older and younger people socialized and enjoyed refreshments together (Fig. 3.10). Social settings in which people from



**Fig. 3.8**  A student fieldworker explains informed consent to an older man in Sharpeville

**Fig. 3.9** A student fieldworker introduces the Yabelana app and USSD code in Sharpeville



**Fig. 3.10** A student fieldworker and an older person socialize after data collection in Ikageng

different generations meet as individuals can serve to break down stereotypical ideas that each may have about the other and reduce barriers to communication (Chigeza et al., 2020; Roos, 2018).

## 3.8  Dissemination

Once the developed technology artefact (the Yabelana app and USSD code) was ready, it was introduced to the older persons in the three research communities of the we-DELIVER project and to representatives of the three groups of stakeholders.

### 3.8.1  Older Persons

Student fieldworkers introduced the Yabelana app and USSD code after establishing a relational connection with the participants, and supported the older persons with appropriate strategies for using the artefact to access information (see Chaps. 7 and 8).

### 3.8.2  SALGA and Age-in-Action

Formal training in the use of the Yabelana app and USSD code and its value in the context of service delivery to older individuals was provided to the stakeholders in the form of a two-day experiential knowledge-sharing workshop. Experiential learning was chosen as the preferred method of introducing the technology artefact that would enhance older individuals' access to service information because we assumed that those attending would learn best by engaging actively in a learning process, as suggested by Everett and Bischoff (2021), complete with intended learning outcomes and real-world application. Attendees became further involved in the process as they reflected on their learning by presenting project proposals for applying Yabelana in service delivery, with clear time frames, dedicated activities, and assigned responsibilities.

The workshops provided information on using ICTs to improve holistic service delivery to older people by local government in five presentations, which covered:

– Population ageing internationally and in South Africa, and the importance of ICT;
– South African legislative guiding frameworks translated into practice;
– Local Government Score Card: implementation and sustainability;
– Community-based situational analysis (needs and resources);
– Yabelana: using information and communication technologies.

The presentation of the workshops was based on the principles of the Ripples on a Pond (ROP) model as an enabling process for adult learning (Fivaz et al., 2011). We applied the model by inviting workshop attendees to listen to the five presentations with the aim of proposing a project for their local contexts. The ROP model proposed by Race (2010) is embedded in five overlapping processes: (1) creating a desire to learn; (2) taking ownership of the need to learn; (3) learning by doing (4); receiving and giving feedback; and (5) absorbing the learning. Our aim was to support workshop attendees in transferring the knowledge they had gained in the workshop to other contexts with a focus on enhancing service delivery to older individuals. Instructions given to the attendees are presented in Box 3.3.

---

**Box 3.3**
**Instructions to Workshop Attendees to Support Active Learning**

- The assignment aims to assist attendees to take an active part in the workshops and to apply the information in practice.
- At the end of the workshop, attendees will be invited to do a presentation in groups of no
  more than four by proposing a project with local relevance, to demonstrate application of the workshop information in practice.
- The project presentation should include action plans, methods of application, and measures for obtaining feedback from older recipients.

---

### 3.8.3 Department of Public Service and Administration (DPSA)

We drafted a policy brief to share the research findings, presented in Box 3.4. A policy brief aims to translate evidence-based knowledge useful to policy makers as non-researchers who operate in a number of multiple levels of locality and governing (Siegel et al., 2021). The knowledge presented should be clear to enable policy makers to determine what solution would work under what conditions while considering rights and responsibilities (Romich & Fentress, 2019). The policy brief for this purpose contained a summary of the research findings with recommendations to assist DPSA to consider possible solutions to enhance older individuals' access to services or to develop information and communication technology interventions using the technology artefact. The policy brief was developed using data from the we-DELIVER project.

**Box 3.4**
**Policy brief. eDirectory Services (Yabelana) for Older South Africans by Local Government.**

**Policy brief. eDirectory Services (Yabelana) for Older South Africans by Local Government**

Yabelana (https://yabelana.org/, app and USSD code *134*237#), was developed from the we-DELIVER project to support local government's delivery of services to their constituents over the age of 60. The steady rise in the number of older growing South Africans (60+) emphasises the important role of information and communication technologies (ICTs) for local government in helping people in their jurisdiction to access much-needed basic and municipal services.

**The Questions:**
- What access do older persons have to cell phones?
- What type of cell phones do older persons use?
- What do they use their cell phones for?
- How did older persons react to having Yabelana on their cell phones?

**The Research:**
- A sample of older persons (n=302) from rural, semi-urban and urban communities completed quantitative questionnaires.
- Qualitative questions were asked of 14 individuals and 22 focus groups in Lokaleng, Ikageng and Sharpeville
- Information obtained included: Demographics, socio-economic indicators, cell phone accessibility, cell phone user patterns and functions, perceived cell phone competence, basic and municipal service delivery needs, and how needs are addressed.
- Receiving feedback from older persons who had been introduced to Yabelana.

**Finding 1: Older persons have access to cell phones**
- Over 90% of older persons in all the research communities have access to cell phones.
- Some older persons (9.1%) have access to more than 5 cell phones.
- Older persons only sometimes use different cell phone features, but 66.1% make and receive calls at least once a day.
- Only 14.2% never use a cell phone, despite having access to one.
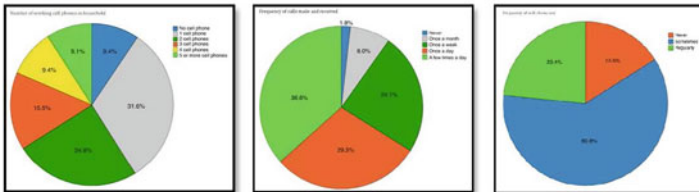


**Finding 2: Older persons use mainly pushbutton phones with basic functions**
- Most older persons' cell phones (91%) are pushbutton devices with basic functionality.
- Older persons use basic phone functions only to send and receive calls and messages.

**Finding 3: Older persons' cell phone use reflects their diverse needs**
- To share and receive information.
- To address their own needs for assistance and instrumental support, and to give and receive help.
- To enquire about basic and municipal services with some found to be while others are age-inappropriate.

**Finding 4: Older persons demonstrated competence in using Yabelana app or USSD code**
- Older persons' negative attitude to using cell phones changed with appropriate learning strategies.
- Older persons ask for help in using cell phones from relatives, usually younger people.
- Many were surprised at their ability to access information using cell phones.
- Older persons expressed a sense of agency and mastery when they accessed information:
  "At least I won't have to go around asking for help in need of an emergency. I can just do it myself" (Older women, Sharpeville Centre for the Aged).

**Policy Recommendations for Local Government**

- Download the Yabelana app from Google Play Store or Apple iStore (USSD)
- Register context-specific basic and municipal services and contact details on the app
- Map needs, resources and services for all citizens (also the aged)
- Update information regularly
- Use short messages and push notifications to share event information (e.g. Alzheimer information days or abuse prevention)

- Provide training for older persons and carers in using cell phones to find information
- Involve older citizens in matters affecting them
- Encourage local government officials to adopt a service delivery and user-friendly attitude
- Use Yabelana to coordinate services and to limit duplication (including by NGOs)

## 3.9    Conclusion

This chapter gives an overview of a research process that came full circle from planning and implementation of a community-based research project to writing this book. It presents the initiatives we applied (questionnaire development and data collection processes) to obtain a baseline understanding of older individuals' cell phone use in relation to the specific research communities and the situatedness of the cohort of older South Africans who volunteered their participation. The knowledge we gained from the two data-collection initiatives informed the development of a technology artefact that offers service information and, through its dissemination, promotes older citizens' inclusion in service delivery. The logical framework that guided our second community-based project provides suggestions for designing and mapping research to promote age-inclusivity. The inclusion of older individuals in research and technology is first and foremost about ethical relational conduct with a keen awareness of their contextual situatedness. Our experience of the process we employed leads to the recommendation for older persons' involvement with technology to be more optimally facilitated than it has been in the past: in this instance, through the involvement of younger student fieldworkers, and by applying social engagement facilitation strategies. The research journey presented in this chapter sets the scene for the chapters that follow, which elaborate on special features of interest that were encountered along the way.

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# Part II
# Principles, Processes and Applications

# Chapter 4
# Situationally and Relationally Guided Ethical Conduct for Researchers: A Community-Based Research Project to Design and Develop an ICT Intervention

**Vera Roos, Puleng Segalo, and Ngenisiwe Ntombela**

**Abstract** Growing discomfort with uncritical applications of generic universal ethics to community-based research, prompted us to (1) problematize a decontextualized application of ethics; (2) apply two heuristic constructs—situatedness and relationality—to a community-based project; and (3) propose revised guidelines for researchers in this field. The we-DELIVER project illustrates our processes for obtaining data from older (60+) South Africans to inform the development of a technology-based ecosystem, Yabelana, which gives them access to service information. In three phases (planning, implementation, and dissemination), we present the situatedness of researchers (including student fieldworkers) and communities. Drawing on relationality, we first expanded older participants' capacity to engage by offering choices and by involving student fieldworkers who shared the same background as the participants to facilitate the use of the technology; and, second, we facilitated optimal interactions by being clear about the nature of the data being collected and by applying social engagement strategies to relate and interact optimally. An optimal interpersonal context preceded technology introduction. The chapter concludes with a plea for reconsideration of current universalized and decontextualized ethical protocols that too often perpetuate situational and relational ignorance. We propose, instead, ethical guidelines for community-based research that engages relationally with participants and best suits their contexts.

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**Keywords** Connections · Community-based research · Diverse contexts ·
Relationality · Research ethics · Situatedness · we-DELIVER

> Given that the idea of the person differs from culture to culture, and taking into consideration
> that conceptions of ethics and personhood are intertwined, it follows that principlism or any
> universalistic approach to ethics, for that matter, is insufficient, as it cannot account for
> ethical definitions and understanding across context, history and time (Mkhize, 2018, p. 28).

## 4.1 The Dilemma of Conducting Community-Based Research Ethically from a Universalist Perspective

Community-orientated researchers around the world increasingly advocate for the
revision of ethics boards' blanket applications of universal moral guidelines drawn
up and used without consideration of context (see Callaway, 2011; Hoffman, 2016;
Liebenberg et al., 2018; Nafukho, 2006; Onuoha, 2007; Rakotsoane & Nicolaides,
2019). A universalist application drawing on Kantian philosophy proposes that what
is morally right should be impartial and determined by abstract, universal reason
(Moore, 1999). The assumption from a universalist perspective is that morally
correct behaviour can be replicated from context to context (Chilisa, 2012;
Liebenberg et al., 2018): what is applicable in westernized Europe, for example,
can be transferred as is to rural Africa. Past harmful research practices in bio-medical
research rightfully informed the development of research ethics to protect human
participants from exploitative practices (Rakotsoane & Nicolaides, 2019; Segalo &
Molobela, 2019; Sichel, 1990). However, when adopting a universalist perspective,
treating all research generically as having the same kinds of risks and benefits is
problematic. A misalignment would result if the same ethical guidelines for bio-
medical research to develop a vaccine for human use, for example, were applied to
social sciences research aiming to obtain information about cell phone use in
different groups of older individuals in relation to their local contexts and available
social networks.

We align ourselves with the sentiments expressed by Collins (2000): we have no
scepticism about applying ethical guidelines (e.g. justice, respect) in conducting
community-based research. Echoing Trickett (1996), however, we are critical of
applying generalized research ethics to all research settings, and relating to all
communities and participants as if contexts and participants were "ahistorical,
acontextual, [and] acultural" (p. 212). We propose, instead, an approach to research
ethics that recognizes communities' situatedness and the importance of relation-
ships. Accordingly, this chapter (1) sets out the problem of applying
decontextualized ethical guidelines to community-based research, using the example
of obtaining informed consent; (2) applies, for the first time, two heuristic constructs
(situatedness and relationality) in three phases of a community-based project; and
(3) proposes broad ethical guidelines for use by community-based researchers.

The tension associated with applying ethical guidelines from a universalist perspective is particularly noticeable in the process of obtaining informed consent. Ethics boards that adopt a universalist perspective generally view participants as autonomous individuals who enter into a form of contractual agreement with researchers, and by extension the institution/ethics boards, when giving informed consent (Rakotsoane & Nicolaides, 2019; Singh & Wassenaar, 2016). The reasoning often used to support this approach is that involving participants who are informed about what would be expected of them and who agree to the risks and benefits associated with the proposed research should be sufficient to indemnify ethics boards, higher education institutions, and researchers (Chennells & Steenkamp, 2018; Sichel, 1990). However, communities and participants on the receiving end of research ethics practices informed by a universalist perspective could be (unintentionally) harmed.

An example, which drew a line in the sand of community-based research ethics, is that of the San people of southern Africa (San Council, 2017). They launched the San Code of Research Ethics as the first code of ethics of an indigenous community in Africa to guide researchers who intend to carry out studies among and with them (Rakotsoane & Nicolaides, 2019; Schroeder et al., 2019). One of the reasons for developing and publishing this code was to respond to the issue of informed consent (not) having been obtained in research conducted in 2010. Researchers who conducted a genomic study using the DNA of four San individuals claimed to have received ethical approval from ethics committees/institutional boards. The researchers failed, however, to commit to the five values identified by the San peoples when conducting their research: respect, honesty, justice and fairness, care, and process (Chennells & Steenkamp, 2018; Schroeder et al., 2019). The San people perceived the researchers' conduct as having disregarded their sociocultural situatedness and their unique social (relational) arrangements. The problem with the blanket application of decontextualized research ethics, as demonstrated in this example, is that the same generalist ethical guidelines may not fit all research settings. A different approach is required.

The two heuristic constructs drawn from an ethics of care perspective—situatedness and relationality—were used to inform the data collection in our we-DELIVER community-based project. Situatedness refers to the tangible physical settings of researchers and participants, their organizational or community histories, and cultural aspects that are embedded in and affected by broader systems (such as economic, social, political, cultural, and digital) (Naidoo et al., 2007; Lazarus et al., 2016; Roos, 2016). Relationality refers to the idea that whenever researchers and participants engage in research they enter into a relationship; relationships of this kind are regarded as the unidirectional dialogue—consisting of verbal and non-verbal cues—between people (Harrell, 2018; Kelly & Westoby, 2018; Roos, 2016). The we-DELIVER community-based research project and our application of the heuristic constructs are discussed in relation to researchers (including student fieldworkers) and participants. Following the example of Kelly and Westoby (2018), we present the project sequentially—planning, implementation, and dissemination—as a type of situational framework for this discussion.

## 4.2   we-DELIVER: Holistic Service Delivery to Older People by Local Government through ICT

The intended outcome of our we-DELIVER project was to collect data for the development of a technology artefact to enhance older persons' (60 years and older) access to information about local services and resources. The initiative aimed to begin to address, through technology, the inclusivity of marginalized older Black South Africans, whose long-term sociopolitical exclusion, digital lag, and changing intergenerational dynamics had compromised their equal inclusion as recipients of service delivery (see Durrheim et al., 2011; Hoffman & Roos, 2021; Roos et al., 2014). The project was funded by the Department of Public Service and Administration on the understanding that it would be completed in 18 months. This ambitious timeline had implications for its scope, but nevertheless presented an opportunity to demonstrate how to conduct community-based research ethically in a way that was sensitive to context and relationships. Since the onus is on researchers to create and apply appropriate conditions for the "authentic exploration of social processes and the creation of interventions of local relevance" (Trickett, 1996, p. 214), we begin our discussion in relation to the research team's situatedness and relationality.

### *4.2.1   Research Team*

Researchers and student fieldworkers from different disciplines and campuses formed the research team. The discussion focuses here on the institutional situatedness of the researchers and the relational strategies applied to deal with group identities and to promote communicative spaces in ways that would facilitate engagement among themselves and between the research team and the participants in the project.

#### 4.2.1.1   Researchers

**Situatedness** At the time the we-DELIVER project was launched, researchers—all of them affiliated to one of the three North-West University campuses (in Mahikeng, Potchefstroom and Vanderbijlpark)—had little experience of engaging in cross-campus collaborative research. To build harmonious relationships and share the benefits of the project funding received, the programme leader expressly extended an invitation to researchers and students from all three campuses to take part.

Informed by the knowledge that contexts are diverse (Trickett, 1996), different recruitment strategies were employed for setting up and conducting the research on the three NWU campuses. On the Mahikeng campus, the invitation to join we-DELIVER was accepted by the leader of a group of researchers who were

seeking a transdisciplinary community project for joint collaboration. They comprised senior and junior researchers and students from various subject disciplines: demography and population studies, development studies, social work, psychology, language studies, biokinetics, information systems, and socio-gerontology. On the Potchefstroom campus, purposive sampling (see Etikan et al., 2016) was applied to recruit researchers and students from law and public administration as well as representatives from NWU's institutional division of sustainability and community engagement. On the Vanderbijlpark campus, socio-gerontologists and student volunteers from public administration and psychology joined the project, following an invitation from their lecturers. They organized themselves under the leadership of an undergraduate public administration student with a keen interest in community empowerment. All researchers and students formally agreed to participate after considering the project proposal, actions, plans, and timelines.

**Relationality** A relationally focused approach was particularly relevant to deal with possible group identities associated with specific NWU campuses, and to break down preconceived ideas and stereotypes formed because of the limited contact among them (see Harrell, 2018). The project leader presented the project details in a transparent way and designed and facilitated communicative spaces for the research team. This co-constructed relational space informed decisions about selecting communities for research and ways to engage with the older participants.

***Transparent Presentation of Project Details*** The open and transparent presentation of the research process applies to researchers to promote their engagement. In this project, a detailed budget, project timelines, and goals were presented at the initial meetings, and documents relevant to the objective of the project were stored on a shared drive to promote open and unlimited access to information. Regular emails to update research team members about changes and to confirm practical arrangements were also used to inform the researchers about the project process. We were clear about the norms that would guide our conduct in relation to co-researchers, student fieldworkers, participants, and other stakeholders. We agreed on a code of conduct that clearly expressed the value of respect for diversity and unconditional acceptance of each other, as illustrated in the first paragraph of the code:

> we-DELIVER is a research project that relies strongly on the efficient collaboration of the diverse community of people involved. We value the involvement of everyone in this project: under- and postgraduate students, postdoctoral research fellows, researchers, rural community members, local government officials, service providers, funders, and other partners. We are committed to creating a friendly and respectful place for learning, teaching and contributing. All participants in our project, as well as communications related to the project, are expected to show respect and courtesy to others.

***Designing and Facilitating Communicative Spaces*** Communicative spaces (see also Groot et al., 2018; Harrell, 2018) were created for every phase of the project and for different purposes. During the first phase, they were used to introduce group norms of respect and of unconditional acceptance, which later would be demonstrated by acknowledging every contribution by researchers and fieldworkers and by taking these into account when making decisions. Active listening (see DeYoung,

2015; Sevenhuijsen, 2014) was introduced as a way of showing respect and applied to make sure that every response would be heard, that it mattered and was interpreted accurately. The communicative spaces in our study served as a shared framework that would, according to Kelly and Westoby (2018), inform the actions of researchers "so that when we move into action, we have a steady, shared frame of reference and we are not so readily swept away by people and events" (p.107).

#### 4.2.1.2 Student Fieldworkers

**Familiar Sociocultural Context** Student fieldworkers who shared the same language and cultural background as the older persons were purposively involved in the project. The assumptions were that a pre-existing moral relationship between generational members (older persons and student fieldworkers) would be activated and that both older and younger people would act according to the standard of behaviour established by the community's culture and socializing symbols (see Chap. 3; Edwards, 2009; Hamington, 2010; Quist-Adade, 2019). Involving student fieldworkers in obtaining informed consent, in data-collection, and in disseminating the Yabelana technology artefact created what Kaplan et al. (2020, p. 4) refer to as "focus points or nodes" for intergenerational interaction. In addition to achieving research goals, the relational stance enhanced positive experiences among generational members during their participation in the research process.

**Relational Engagement of Student Fieldworkers** Researchers with domain-specific knowledge trained bilingual or multilingual[1] student fieldworkers in topics related to approaches to community engagement, qualitative interviews, and the use of survey analytics on electronic devices to capture participants' responses. The relationally focused approach used in the training sessions involved welcoming the students warmly, expressing gratitude for their willingness to join the project, and creating a space that invited reciprocal interaction. The student fieldworkers responded to the invitation and spontaneously shared knowledge about the situatedness of the community and their experiences of older persons and cell phones. Those who attended the training sessions and took part in the data collection were offered refreshments, and the student fieldworkers who had volunteered to transcribe interviews and focus groups after data had been collected, received remuneration according to fees set.

### 4.2.2 Communities

**Situatedness** Considering the ambitious timeline set for project completion, and being especially aware of the importance of building trusting relationships with

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[1] South Africa has 11 official languages

communities (see also Kelly & Westoby, 2018; Theron, 2013), the project team decided to identify communities with whom the researchers had existing relationships and ask if they would be interested in participating in the we-DELIVER project. Three distinctly different communities, ranging from rural to more resourced settings, were identified: Lokaleng (a rural area with Setswana-speaking residents), situated next to the Mahikeng campus; Ikageng (a large town with Setswana-speaking residents), close to the Potchefstroom campus; and Sharpeville (a large town with Sesotho and isiZulu-speaking residents), near the Vanderbijlpark campus. Setswana, Sesotho, and isiZulu are among South Africa's official languages. To obtain an insider perspective, researchers, student fieldworkers, community gate-keepers, and an older person, all of whom were knowledgeable about the contexts of the different communities and issues affecting older individuals, were consulted for input in designing context-specific recruitment and sampling older participants.

**Acknowledging Multiple Positionalities** We recognized that we, as researchers and students, have multiple positionalities, as noted by Blazek, Smith, Lemešova and Hricová (2015), in relation to older members of the research communities. We were aware that we represented academic institutions steeped in westernized approaches to education. Regarding the involvement of student fieldworkers, we knew that implicit hierarchical relational structures would be activated when young student fieldworkers and older participants interacted in the research setting. We therefore aligned ourselves with the sentiments expressed by Collins (2000) that researchers enter into contexts with their own histories and values and should acknowledge this fact and reflect on it.

## 4.3  Project Phases Guided by Situatedness and Relationality

The discussion is presented here in a time framework consisting of three phases—planning, implementation, and dissemination—and draws on situatedness and relationality as guiding heuristic constructs.

### 4.3.1  Planning Phase

**Situatedness** Older Black South Africans were identified as the we-DELIVER target group. As marginalized people, often excluded from research, they have continued to suffer the consequences of lifelong structural exclusion resulting from the country's pre-1994 sociopolitical dispensation. The Apartheid regime of the time excluded many Black people from obtaining a proper education, and for the majority this resulted in persistent low literacy levels that increase their dependence on external support (Durrheim et al., 2011; Hoffman & Roos, 2021).

Two issues illustrate how the situatedness of the communities differed and how this informed ethical research conduct: gaining access and multiple versions of a vernacular.

*Gaining Access* The differing contexts of the three communities required a pluralistic approach to gain access to them. We identified gatekeepers and briefed them about the aims of the project and its expected outcomes so that they could decide if they wanted to extend the invitation to project participation to the relevant decision makers and the older participants.

In Lokaleng, a ward councillor, acting in this capacity, introduced the project to the *kgosikgolo* (the traditional leader of the rural community), who gave consent after consultations had been held with the King's elders/advisers (*baeletsi*) (Roets & Molapo, 2019) (see Fig. 4.1). The appropriate protocol was followed to ensure that the research team engaged respectfully with the *kgosikgolo*. On the day the project was presented to the rural Lokaleng community, the women researchers covered their heads as a sign of respect. The introduction was followed by the formal launch of the project and the commencement of data collection.

In Ikageng and Sharpeville, councillors gave permission for researchers to approach older persons in their wards. In Ikageng, the chairperson of one of the luncheon clubs, whom we knew from previous community projects, identified 32 clubs that were willing to invite some of their older members to participate in the research. Owing to mobility challenges, not all older persons were able to participate. In Sharpeville, we obtained access with the assistance of a social worker involved with older persons who came together every week in a communal meeting place.

We knew that obtaining informed consent in the selected communities would involve a communal decision-making process (see Rakotsoane & Nicolaides, 2019).



**Fig. 4.1** A ward councillor addresses older participants about proposed research in rural Lokaleng

We obtained informed consent as part of a trusting and an ongoing relationship rather than a single occurrence (see Kelly & Westoby, 2018; Vitak & Shilton, 2020), through iterative formal and informal dialogue with participants and community structures.

**Multiple Versions of a Vernacular** The Setswana vernacular of older persons in rural Lokaleng differed from that of Ikageng. To produce an accessible version of research materials for all participants (advertisements, informed consent, questionnaire, and qualitative interview questions), they were developed in English and translated into the preferred community vernaculars. The questionnaire underwent several translational processes. A first round of translation was conducted by language experts in the research team and presented to student fieldworkers whose mother tongue was Setswana for comment and suggestions. The student fieldworkers presented the questionnaires informally for input from older persons they knew. Feedback from the older persons and student fieldworkers indicated that the wording of some questions was confusing or inappropriate. This was corrected and the materials were presented to NWU's language directorate, who highlighted several language construction issues. A pilot study informed further revisions and, finally, we consulted a Setswana-speaking psychologist who was knowledgeable about community-based research involving people with limited literacy. He verified the translations of the questionnaire (see Chap. 5 for a detailed discussion).

**Relationality** We adopted a relational approach and intentionally tried "seeing through the eyes of the other" (Kelly & Westoby, 2018, p. 65). We selected appropriate options to acknowledge the diversity among the older individuals— some with limited literacy and others who had completed formal education. We provided participants with choices in giving consent—either in writing or orally (see example at the end of this chapter).

### 4.3.2 Implementation Phase

The situatedness of each of the communities informed practical arrangements for conducting the research, and an integrated relational approach was applied to support older participant' participation.

**Situatedness** The diverse community settings called for appropriate adaptation to the differing conditions. In Lokaleng, the traditional open-air meeting place *(kraal)* provided little shelter for older participants and the research team when data were collected. We anticipated allowing four to five hours for exchanging mutual greetings, welcoming, explaining the aim of the visit, obtaining informed consent, and providing regular comfort breaks during data collection to prevent the older participants' becoming exhausted. For additional protection and comfort, we hired a tent and chairs from a local businessperson. In Ikageng and Sharpeville, the chairperson of a day-care centre for older persons offered the use of facilities.

**An Integrated Relational Approach** We anticipated that inviting older persons to participate in research about their cell phone use in an unfamiliar research context

Fig. 4.2 A student
fieldworker explains
informed consent to an older
male participant



could be anxiety-provoking for some. The literature confirms that people's reactions
tend to be biased toward responses, such as disengagement, to protect themselves
against feeling unsafe if the environment is experienced as unpredictable (unsafe)
(see Dana, 2020). We therefore needed to expand older participants' capacity to
engage in the research and pay attention to how we related and interacted with them.

*Expand Participants' Capacity to Engage* We applied two strategies. First,
participants were given the opportunity to exercise free choice which meant that
they could decide whether to participate or not, and how they preferred to give
consent. When choices are available in relatively uncertain situations they promote a
sense of safety and control, and people's consciousness is expanded (Adhariani
et al., 2017; Bennoun et al., 2018; Levine, 2010). Those older persons who opted not
to participate observed the process or enjoyed refreshments. Second, we arranged for
the explanation of informed consent to come from someone with similar character-
istics to those of the older participants (e.g. language) (see Edwards, 2009; Harrell,
2018). For example, Fig. 4.2 shows a Sesotho-speaking fieldworker engaging with a
Sesotho-speaking older man to obtain oral consent in Sharpeville.

*Relating and Interacting Optimally* In promoting optimal interactions between
researchers (including student fieldworkers) and older participants, we applied the
following supportive strategies:

1. We set out to provide a clear context (also referred to as a boundary around the
   interaction in Roos, 2018; Vorster et al., 2013; Watzlawick et al., 2011) by being
   clear in terms of who would be interacting, the nature of the data, and the method
   of collection, what would be expected of participants, and what they would
   gained by taking part. We also informed participants that they could leave the
   research setting at any time. As researchers, we treated informed consent as a
   unidirectional process whereby participants were able to express any uncer-
   tainties or questions to which we responded before the research commenced.
2. To present ourselves to one another (see Kelly & Westoby, 2018), and to promote
   what Vorster et al. (2013) refer to as transparency, the researchers, student

**Fig. 4.3** Older women (wearing aprons) and student fieldworkers serve traditional food for the communal meal

fieldworkers, and participants wore name tags. During data collection, fieldworkers also showed older participants how their answers were being captured on mobile devices. Transparency in the communication with older participants was further promoted by student fieldworkers taking care to speak clearly, not too rapidly, and refraining from using academic jargon (see Vorster et al., 2013).

3. We created safe social interactions, which according to Dana (2020), consist of verbal and non-verbal messages (e.g. facial expression, voice) to foster the connections. Student fieldworkers welcomed the older participants, thanking each warmly for coming to take part in the project and offering a chair. The student fieldworkers addressed older persons appropriately and politely, and as an expression of respect avoided making direct eye contact. During data collection, student fieldworkers listened attentively to the older persons, even if they wandered off-topic, and checked regularly to see if a comfort break was needed.

4. On completion of data gathering, the researchers, student fieldworkers, and participants socialized and all had a meal together. In Fig. 4.3, older women, with help from student fieldworkers, dish up the meal they had prepared for everyone involved in the project.

All these different actions contributed towards making ourselves present and helped to "break across separateness and put us within reach of each other" (Kelly & Westoby, 2018, p. 74).

### 4.3.3   Dissemination Phase

Community-based research ethics involves sharing new knowledge with participants
—in this instance the technology artefact, developed from the information obtained
from them. The situatedness of all three communities again informed the processes
followed to share the Yabelana technology artefact (app and USSD code).

**Situatedness** In Lokaleng, the councillor informed older participants of the date
and time when student fieldworkers would be visiting them. In Ikageng, student
fieldworkers arranged meetings with the chairpersons of the luncheon clubs. In these
smaller, more informally organized groups, older persons invited the student
fieldworkers to join them at their usual weekly meetings. Student fieldworkers
complied with the dates, times, and the programme proposed by the older persons.
This involved joining in the opening prayer, doing exercises (see Fig. 4.4) together,
and singing songs. Following the agenda, the chairperson introduced the student
fieldworkers and asked them to talk about the reason for their visit. In Sharpeville,
the luncheon club's chairperson was similarly contacted and asked to include the
research project in the agenda for discussion.

**Relationality** A supportive interpersonal context was created for the introduction
of the Yabelana technology artefact. Two guiding constructs from a social-
constructivist perspective informed the dissemination of the Yabelana app and



**Fig. 4.4**  A student fieldworker joins older women in an exercise session in Ikageng

USSD code: zone of proximal development and scaffolding. The zone of proximal development refers to learning through supportive and knowledgeable people using the (older) learners' actual level of knowledge to provide assistance while allowing for self-exploration (Jörg, 2006). Scaffolding involves sequenced and structured instructions and activities to support people as they attempt to construct their own learning by making sense of the learning content (Oliver & Herrington, 2003; Steward, 2012).

*Zone of Proximal Development* Older persons and student fieldworkers formed smaller groups, with no more than three older persons to a student fieldworker (see Figs. 4.5 and 4.6). We based our decision for this number on the optimal group size to enable participation (see Kelly & Westoby, 2018). In these small groups, student fieldworkers observed older participants' needs for comfort breaks and their level of skills, and listened to the problems they had encountered with technology. The older persons' use of the Yabelana system was supported by the guidance and encouragement of knowledgeable, trained student fieldworkers (see Moll (2014). The older persons' knowledge construction was further supported by authentic contextualized activities, which meant that the information was presented in a subjective, experiential form with real-world relevance for them (see Kelly & Westoby, 2018; Oliver



**Fig. 4.5** Young fieldworker demonstrate the Yabelana system on older persons' cell phones

**Fig. 4.6** Young fieldworker demonstrate the Yabelana system to two older women

& Herrington, 2003). Student fieldworkers demonstrated how to download the Yabelana app on to smart phones and presented the USSD code. To narrow the gap between the Yabelana USSD code and what the older persons already knew about using codes, student fieldworkers reminded them of a familiar process—uploading airtime. According to Steward (2012), prior understanding of a similar action helps with the assimilation of new knowledge.

*Scaffolding* We used a sequenced process whereby student fieldworkers introduced the app and USSD to the older persons. First, the fieldworkers demonstrated how to access information using the USSD code on the older persons' mobile devices or, if they did not have their phones with them, on the students' phones. Second, older persons were invited to experiment with the app and USSD to find general information, and third, older persons practised accessing the information independently. When they got stuck they asked for support from the student fieldworkers or their peers. Student fieldworkers simplified the task of learning the USSD code for the older participants: some created a memory association by presenting the numbers (*134*237#) as a short rhythmic repetition of words, while others designed fridge magnets inscribed with the USSD code for easy access.

The supportive relational context in which the Yabelana system was disseminated provided a space for connections between older persons and student fieldworkers. According to Anderson (2011), learning is enhanced when participants are encouraged to "express their ideas, and to present themselves as real and functioning human beings" (p. 344). The responses of our older persons and student fieldworkers when this process had been followed confirmed that both groups felt affirmed as individuals (see also Chap. 7). The older participants' responses ranged from delight,

gratitude, and relief to feelings of empowerment by being able to seek help independently: "I am happy that there is something like this. To help us find emergency numbers easily", and "Wow, thank you my child (student fieldworker)! I didn't know this was even possible", and "At least I won't have to go around asking for help in an emergency. I can just do it myself", and "I can't wait to brag to my grandchildren when I get home."

The reports the student fieldworkers prepared revealed the insights they obtained through their experiences with the older participants, and indicated clearly that their earlier stereotyped comparisons, projections or judgements about older persons had changed:

> Some students had preconceived ideas and stereotypes about older people (such as older people are slow to learn). In many cases it appears that these stereotypes were proven wrong and students had more positive perceptions of older people after the study.

> Interacting with older people was amazing. They are very kind and genuine people. With incredible love and care! They were friendly and open to us, as well as to learn about the app. They were also comfortable in talking to us and letting us help them with the app.

The we-DELIVER community-based research project, as the case in point, illustrates practical ways to treat participants and fellow researchers in a humane, respectful, and courteous manner, following the thinking of Ramose (2002).

## 4.4  Broad Guidelines for Community-Based Research

The guidelines proposed here for community-based research are informed by the conviction of Kelly and Westoby (2018, p. 24) that it should be relevant, appropriate and flexible:

– methodological but not mechanistic
– systematic but not dogmatic
– intentional but not inflexible
– rhythmical but not habitual
– procedural but not predetermined.

A context-sensitive approach recognizes that researchers' situatedness is embedded in broader sociocultural, historical, and sociopolitical contexts, and is as relevant as that of communities and participants. The situatedness of communities participating in research indicates the need for relevant sensitive sociocultural practices and appropriate actions on the part of researchers, especially when engaging with marginalized groups who are prone to be on the receiving end of exclusionist practices.

However, community-based research is ambiguous and fluid, and despite being sensitive to situatedness we did not always get it right in our project. For example, when visiting the rural community in Lokaleng, women researchers and fieldworkers demonstrated respect to the *kgosikgolo* and the *baeletsi* by covering their heads, but

did not notice the inconsistency of wearing pants (trousers) or jeans at the time. A student fieldworker reflected: "I was embarrassed to be at the council in pants. That is not how women should dress when they go to the council." It is through such reflective practices that we as researchers learn and become more attuned to how we relate and interact in different sociocultural contexts.

Relationality as a guiding community-based research construct has implications for the paradigm that ethics bodies could usefully adopt to inform their guidelines and their engagement with research applications, researchers, and students. Relationality makes it relevant for the community-based research team to: (1) engage as people, irrespective of their roles as researchers, student fieldworkers or participants; (2) deliberately facilitate communicative spaces and practices that acknowledge all contributions from everyone in the project; and (3) recognize the multiple positionalities of researchers, fieldworkers, and participants. Relationality should effectively promote a sense of interpersonal safety in a socioculturally appropriate manner; be clear about the boundaries of the interaction; and include social engagement strategies in the research setting to broaden participants' capacity to participate in the research.

## 4.5   Conclusion

We call for a rethinking and a review of the—too often inappropriate—application of general, universal ethical principles to the range of different types of research. This chapter illustrates, for example, how relationality guided the ethics of planning, implementation, and dissemination of a community-based project, and the relevance of this principle for all the role players—participants, as well as researchers and fieldworkers. In the process of ensuring that everyone's rights are protected, the situatedness of communities and researchers needs to be taken seriously, guided by a context-sensitive perspective. We began by setting out the misalignment in applying generalist ethical guidelines across the board, irrespective of the nature of the research topic and without consideration of communities' and participants' situatedness. Context matters when embarking on community-based research; it needs to be at the heart of the ethical practices that guide this kind of investigation.

# Appendix



**OLDER PEOPLE'S ORAL INFORMATION <u>AND</u> WRITTEN CONSENT**
**we-DELIVER: Holistic service delivery to older people by local government through ICTs**
**ETHICAL APPROVAL NUMBER: NWU-HS-2017-0073**

Hello, my name is_____. I'm currently doing my first degree (undergrad) /a PhD/Master's student/a researcher at North-West University. We are doing a study and I was hoping that you would be interested to help us. Our study is about getting information about services that could be useful to older people and how people can get the information by using their cell phones. May I tell you more about the study, which is called the 'we-DELIVER' study?

The 'we-DELIVER' study aims to improve direct service delivery to people who are 60 years old and older, from the communities of Lokaleng (Mahikeng) and Ikageng (JB Marks local municipality in Dr. Kenneth Kaunda district) in the North West Province, and Sharpeville in (Emfuleni local municipality) in the Gauteng Province. If you choose to be a part of this study the following will happen: you will be asked to answer questions from a questionnaire of 30 questions and this will take 25 minutes. Some of you will also be asked to individually or in a group talk to a researcher, who will ask you short questions, which will take approximately another 25 minutes. Some of the people we talk to will be asked to join other people in a group to talk about the same topics that we are going to use in the interviews. For these group talks, a group of eight to ten people will be invited. The group talks will take approximately 30 minutes. The individual and the group talks will be recorded on an audio-recorder. The study will be carried out by researchers who have been trained in using questionnaires and how to do short interviews and group talks.

For completing the questionnaire the researcher (me) will have a conversation with you about each and every question. I will ask you about 30 questions. You will have enough time to think about each answer and if you do not know the answer you do not have to answer, but if you want to answer the question you are also welcome to ask somebody else for the answer.

All other information that people share will be used for this study and other studies without identifying the person who gave the information. The information will be placed where other people can see it, but your name will not be linked to the information. When people write about this study, your name will not be used, unless

you prefer it. I will ask you to say if it is in order if we use your name in written pieces about this study or use the photos we have taken of. Is that okay with you?

The following risks are involved in taking part.

| Probable/possible risks/discomforts | Strategies to minimize risk/discomfort |
|---|---|
| Some of you will be spending one hour and 30 minutes to give information for the study. It is possible that you will become tired. | We will ensure that people who join the study have chairs. Researchers will give regular comfort breaks and you will all receive refreshments (juice and fruit) about halfway through. |
| You may feel uncomfortable when asked questions whose answers you do not know. | You will be asked to answer certain questions or participate in group talks with guiding questions. Researchers will be trained in asking guiding questions and in holding group talks. There is no right or wrong answer, and you have the right not to answer any question if that is what you choose to do. The questions will be asked in simple language and you do not have to complete the questionnaire on your own. Someone will help you with that. We have also asked people from the community to help us so that we do not ask questions that make you feel uncomfortable. |

The direct benefits to older people:

- You can get information about services easily by using your cell phone or by asking someone to use their cell phones to get the information.
- You will be able to give feedback on your cell phone about the way in which the information about the services is provided.
- The service providers for older people's needs may use this information to find out which needs are not addressed.

With your permission, I would like to make an audio recording of our discussion to make sure I'm getting the information from you in the way we talked about it. Or I can take notes in my notebook. Which do you prefer? Can we also take a photo of you in the group or while you are talking to me? The photos will be used when people write about this study.

These are some of the ways in which the information from this study will be reported on: writing policy briefs, articles or in books and research reports, and presentations at conferences. In all this reporting, nobody will know that it is you who said these things unless you ask specifically to be identified. This means that the reporting will not include your name or other personal details, for example your

home address, that could let others know what you said when you have participated. You will be asked for your permission to use some of the direct words you have said.

If you have any complaints or concerns please feel free to contact me in the first instance. My cell phone number is _____ You can also reach me at [North-West University email address]_____.

This study has been reviewed and approved by a North-West University ethics committee. If, after contacting me with any concern you have, you remain unhappy and wish to make a formal complaint, please contact the ethics committee chair _____[Name] at _____ [Telephone number] or at _____ [Email address]_____. You can also contact the co-chair, _____ [Name] at [Telephone number] or at _____ [Email address]_____, or the secretary, [Name] at [Telephone number] or at _____ [Email address]_____.

Do you have any questions?

***[Oral consent-seeking stage, after participant has had sufficient time to think about whether s/he wants to take part]***

**Record answer as yes or no.**

| | |
|---|---|
| Do you give your permission for me to interview you/take your photo/video you? | |
| Do you give me permission to audio record you? | |
| Do you give your permission for us to use your photo? | |
| Are you happy to take part? | |

Thanks, in which case let's start.

**we-DELIVER: Holistic service delivery to older people by local government through ICTs**

**ETHICAL APPROVAL NUMBER: NWU-HS-2017-0073**

**Researcher record of oral consent**

| | |
|---|---|
| **Date** | |
| **Location (City/Region)** | |
| **Interviewee Name or Number** | |
| **Project Explained (Yes/No)** | |
| **Interview Recorded or Notes Taken** | |
| **Participant and Quotes** | **Indicate Yes (Y)/No (N)** |
| | **Direct quotes** |
| | **Quotes which would not identify them** |
| | **Not to be quoted at all** |
| **Participant and Photos** | **Photos which identify them** |
| | **Photos which would not identify them** |
| | **Not to be photographed at all** |

[INSERT NAME]_____                    _____

**Name of Researcher**                                                      **Signature of Researcher**

**(Signed in the presence of the interviewee to confirm oral consent)**

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# Chapter 5
# Developing a Questionnaire to Investigate Older Individuals' Cell Phone Use and Age-Inclusive Implementation through Technology

**Mianda Erasmus, Elizabeth Bothma, and Vera Roos**

**Abstract** No questionnaires to obtain information about older South Africans' cell phone use were available. This chapter details the development of three new questionnaires for this purpose. The iGNiTe questionnaire (Version 1) addressed the need for information about older persons' cell phone use and intra/intergenerational relations. Items, in English, were derived from the literature and current research, subsequently translated into Afrikaans, and piloted. Trained student fieldworkers used devices to collect responses from selected older individuals ($n = 128$). The results of exploratory factor analyses and reliability coefficients then informed the we-DELIVER questionnaire (Version 2) for collecting data on older persons' cell phone use and service needs. Subject experts' revisions preceded piloting. Questionnaires were translated from English into Setswana, Sesotho, and isiZulu and administered by student fieldworkers. The results ($n = 302$) were analysed and literature and theory consulted to develop Version 3, AGeConnect. We present what we believe to be the first online questionnaire (https://ageconnect.questionpro.com/) designed to longitudinally study and document data on older individuals' cell phone use here and abroad. (Afrikaans, English, Setswana, Sesotho, and isiZulu are five of South Africa's 11 official languages).

**Keywords** AGeConnect questionnaire · Age-inclusive · Cell phone technology · Intergenerational facilitation · Older individuals · Questionnaire design

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## 5.1   Introduction

Population ageing, or what Kaplan et al. (2017 p. v) call the "longevity revolution", bears testimony to the remarkable modern health and medical advancements that have been achieved globally (WHO, 2015, 2020). While longevity is to be celebrated, the reality is that the growing number of older individuals' age-related care needs are also increasing exponentially (see Chap. 1). The World Health Organization (WHO) proposed a framework for including older individuals in the provision of affordable and accessible care and primary health services, and for doing so in age-integrated societies and communities (WHO, 2015, 2020) where people of all ages have access to infrastructure (e.g. housing, safe neighbourhoods, and physical spaces for recreation, etc.), services (basic and municipal), transport, the social environment (education, recreation, physical, and spiritual activities (Kaplan et al., 2017; Walsh et al., 2017; Warth 2016; WHO, 2007), and technology (Lui et al., 2009; Menec et al., 2011). In age-inclusive communities and societies, people at every stage of life attend to their commonalities or shared interests in a trusting and reciprocal, caring manner (Annan, 1998; Kaplan et al., 2017; United Nations, 2002). Intergenerationality is, therefore, implicit in the notion of age-inclusiveness and is promoted by social connectedness, engagement, and respect (Annan, 1998; Steels, 2015).

The use of information and communication technology (ICT) is globally considered a feasible approach for providing age-integrated services (WHO, 2015). In developed countries, for example, technology is used to link older individuals with their healthcare teams, communities, and social services, while also providing healthcare workers with useful information (Calvert Jr et al., 2009; Cerrito et al., 2015; WHO, 2015). Planning and implementing appropriate ICT interventions (eInterventions) to enhance older individuals' inclusivity assume that relevant knowledge about their use of technology is available, but this is not always the case. In this chapter, we present the longitudinal iterative process we followed to develop a questionnaire on older persons' cell phone use for a variety of research purposes. We provide a version (online and included at the end of this chapter) for further revisions and development—to the best of our knowledge, this is the first online questionnaire developed specifically to collect this kind of information for developing country conditions.

Specifically, the wide uptake of cell phones in sub-Saharan Africa presents unexplored opportunities to promote and improve access to service delivery for all, including older individuals. This is particularly relevant in an emerging country such as South Africa, where the increasing numbers of older individuals, the rise in non-communicable diseases, and wavering (instrumental as well as emotional) support from younger people present obstacles to the appropriate delivery of social and healthcare services to older individuals (see Chap. 1). Because little is known about how older individuals in South Africa use cell phones, and no relevant questionnaires accessible for the purpose of obtaining this information could be found, a dedicated questionnaire was developed, following a pragmatic approach.
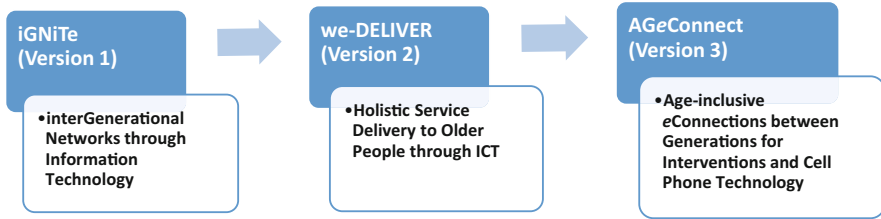
**Fig. 5.1** Sequential development of versions of a questionnaire on older persons' cell phone use applied to different research processes

Pragmatism assumes that knowledge (in this instance, regarding older individuals' cell phone use) is obtained through iterative processes to find solutions for problems in physical and social contexts (in our case, related to service delivery) (Campbell, 2011; Dixon, 2019; Rorty et al., 2004).

Several self-designed questionnaires for collecting information about the cell phone use of older individuals have been referenced in the literature, but the full questionnaires are for the most part not provided—only descriptions of the sections included in the questionnaires are reported (Lee 2007; Rahim et al. 2020). To address this gap, we decided to develop our own and make it publicly available. In addition, we believed that reporting on the developmental process would assist researchers with similar needs to draw up further relevant questionnaires. As Foxcroft (2004) advised, the research context, the target population, potential sociocultural influences, and the appropriate method of administration need to be considered throughout the process of developing a questionnaire.

Our first questionnaire (Version 1) was developed in 2014 to obtain baseline data of older individuals' cell phone use in South Africa, as part of a small self-funded study entitled Older Individuals' Cell Phone Use and Intra/Intergenerational Networks (iGNiTe). Version 1 was subsequently adapted to create Version 2 in 2017, when funding had been obtained for the project called we-DELIVER: Holistic Service Delivery to Older People by local government through ICT. Based on our findings, we then developed Version 3—the AGeConnect questionnaire—which we present in this chapter. The sequential development of the three versions of the questionnaire is shown in Fig. 5.1 and the process we followed is discussed in detail in the rest of this chapter.

## 5.2   The iGNiTe Questionnaire (Older Individuals' Cell Phone Use and Intra/Intergenerational Networks)

The need to obtain information about older South Africans' cell phone use stimulated a discussion among three social gerontologists (Jaco Hoffman, Doris Bohman, and Vera Roos) and resulted in the development of the iGNiTe questionnaire. The items that they suggested for inclusion were based on their collective social

gerontological expertise (sociology, nursing, and psychology) (V. Roos personal communication, 6 February 2017). Items were not organized according to specific categories in the questionnaire but served to collect information on the following topics:

– Biographical information: items related to older individuals' age, gender, place of residence, level of education, and household composition;
– Items required for application of The South African Advertising Research Foundation's (SAARF) Universal Living Standards Measure (SU-LSM™) (this measure, developed as a research tool, has become a widely used segmentation tool in South Africa (Haupt, 2017; South African Audience Research Foundation, 2017): the original measure consisted of 25 questions that classified the population into levels from 1 to 10, with 1 indicating very low income and minimal access to services, and 10 indicating high income and full access to services; the latest version of the SU-LSM™ consists of 29 questions and provides a more refined version of living standards, including ownership of certain household items (Eighty20, n.d.; Haupt, 2017; SAARF, 2017);
– Cell phone information: items about older participants' access, ownership and use of cell phones, as well as details about their functionalities;
– Cell phone user patterns: items including questions about older individuals' use of specific cell phone functions, ranging from basic to more advanced, and frequency of use;
– Social networks around older persons' cell phone use: items on social arrangements around older individuals' cell phone use;
– Cell phone use competence: items related to older individuals' self-perceived knowledge, skills, and attitude;
– An open-ended question at the end of the questionnaire: this asked older participants how they had experienced participating in the technology-based questionnaire about their cell phone use.

In 2014 a concurrent mixed methods research design (see Fetters et al., 2013) was applied and the iGNiTe questionnaire was administered to older participants ($n = 128$) in three communities in the Potchefstroom area (120 km south-west of Johannesburg) in the North West province of South Africa. In addition to the questionnaire, three qualitative methods were employed to collect further information from a total of 52 older individuals, who participated in semi-structured interviews ($n = 23$), focus groups ($n = 10$), and the visual data-collection Mmogo-method® (Roos, 2008, 2016) ($n = 19$).

## 5.2.1   Participants and Data Collection

Purposive sampling was used to identify three day-care centres for older persons in the Potchefstroom area in close proximity to the researchers, and criterion sampling was applied to select the older participants (see Patton, 2002). Participants were

selected based on the following inclusion criteria: persons 60 years or older who had access to a cell phone, and who did not present with any observable cognitive impairments preventing them from interacting coherently with the researchers. Version 1 of the questionnaire was uploaded onto digital devices (cell phones or tablets) to capture responses directly on the SurveyToGo application (dooblo.net, 2005). Informed by the idea that age-inclusiveness is promoted through intergenerationality (Kaplan et al., 2017), we invited students familiar with the vernacular and sociocultural context of the older participants to be trained as fieldworkers (see Chaps. 3 and 4). Drawing on pragmatism and Dewey's (1998) notion that communication is transformation, we assumed that the communication processes between the younger and older people could alter or redirect the older individuals' relationship with technology positively (Dixon, 2019). Unfortunately, owing to problems including lack of transport and child care responsibilities, some older individuals—mainly from low-resourced areas around Potchefstroom (Promosa and Ikageng) to which they had previously been removed—were unable to attend on the day the data were collected. Consequently, data skewed towards people with higher LSM levels were obtained. The biographical information of participants is provided in Table 5.1.

Results were skewed towards the majority of the selected older participants living in Potchefstroom (almost 60%) who had completed 12 years of formal education including those with postgraduate degrees. The remaining participants reported primary level educational levels or no formal education. In this sample of older participants, about half reported higher LSM scores (57.5% on levels 8 to 10) and the rest reported LSM levels 4 to 7.

The findings from the semi-structured interviews, focus groups, and the Mmogo-method® gave information (first reported as part of master students' dissertations; later published in articles) about the following topics related to the older participants' cell phone use: lack of basic skills and knowledge to use cell phones compensated for by applying various relational strategies (Steyn et al., 2018); perceived level of competence in using cell phone devices and different cell phone features (Leburu et al., 2018); assistance from younger people with cell phone use (Leburu et al., 2018; Scholtz, 2015); and reasons for using cell phones (Lamont et al., 2017). The findings of the analysed data which are reported in the published articles informed revisions to Version 2 of the questionnaire.

## 5.2.2  *Statistical Analysis and Results from the iGNiTe Questionnaire*

The sample was described from the results of a frequency analysis and descriptive statistics, including means and standard deviations. The content validity of the questionnaire was confirmed by the three social gerontologists (Jaco Hoffman, Doris Bohman and Vera Roos), who reviewed the subject matter. Reliability was

**Table 5.1** Characteristics of the iGNiTe participants ($n = 128$)

| Item | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 26 | 20.3 |
| | Female | 102 | 79.7 |
| Education | No education | 6 | 4.7 |
| | Primary school | 28 | 21.9 |
| | High school | 23 | 18.0 |
| | Matric certificate | 38 | 29.7 |
| | Degree/diploma | 27 | 21.1 |
| | Postgraduate | 6 | 4.7 |
| Area | Ikageng | 28 | 21.9 |
| | Promosa | 17 | 13.3 |
| | Potchefstroom | 83 | 64.8 |
| Living with | Nobody else | 26 | 22.6 |
| | Spouse | 45 | 39.1 |
| | Children | 35 | 30.4 |
| | Grandchildren | 35 | 30.4 |
| | Siblings | 2 | 1.7 |
| | Parents | 0 | 0.0 |
| | Grandparents | 0 | 0.0 |
| | Friends | 8 | 7.0 |
| LSM score | 1 | 0 | 0.0 |
| | 2 | 0 | 0.0 |
| | 3 | 2 | 1.6 |
| | 4 | 3 | 2.4 |
| | 5 | 8 | 6.3 |
| | 6 | 26 | 20.5 |
| | 7 | 15 | 11.8 |
| | 8 | 11 | 8.7 |
| | 9 | 22 | 17.3 |
| | 10 | 40 | 31.5 |

*Note.* Living with… percentage given out of 100% for each category presented in Table 5.1

determined with Cronbach's alpha ($\alpha$), with the suggested acceptable cut-off value of $\alpha > 0.70$ (Field, 2018). Because no factor structure existed, reliability was calculated for the questionnaire as a whole, and for two possible subscales identified by visual inspection. These two subscales were labelled Frequency of feature use (including items 15 to 28, e.g. "How often do you make and receive calls?", "How often do you go on the internet?", "How often do you take photos?"), and Attitude towards the phone (including items 32.1 to 32.7, e.g. "The phone menu is understandable", "My airtime limits my functions", "I know how to work with my phone"). The reliability coefficients were found to be unacceptable for one potential subscale (attitude towards phone: $\alpha = 0.64$) but acceptable for the complete questionnaire and the other potential subscale (iGNiTe questionnaire: $\alpha = 0.89$; and frequency of feature use: $\alpha = 0.78$).

Exploratory factor analyses (EFAs) were applied to explore the factor structure of the questionnaire. The iGNiTe questionnaire did not contain specific sections: the list of 41 items began with the biographical questions, followed by the rest in no particular order. EFAs were conducted on the two visually identified possible subscales: Frequency of feature use, and Attitude towards the phone. Based on the EFA results, it was suggested that Frequency of feature use could be split into three factors: "Basic feature use", "Advanced texting and imaging", and "Internet-dependent features". The number of items could be reduced. For example, item 17 did not load on a factor at all ("How often do you send and receive an MMS?"). Items could also be added (e.g. "How often do you look at the time?") to collect more detailed information where necessary, or rephrased (e.g. "How often do you play music/ radio?") based on the different ways phone technology has changed. The potential subscale for Attitude towards the phone indicated a one-factor structure, with only four of the seven items loading on the factor. The suggestion was to re-evaluate whether the items included did in fact measure attitude and whether they were clear and unambiguous. The intent of the EFAs was to explore the factor structure of the questionnaire and to provide suggestions that might improve model fit and reliability levels of the questionnaire, thereby increasing the quality of data collected in future.

Although these suggestions from the iGNiTe results were considered for the development of the second we-DELIVER version, it was noted that the very small ratio (1:3.12) between the number of items (41) and the sample size ($n = 128$), was a definite limitation to a confident interpretation of the results from the EFAs.

## 5.3 The we-DELIVER Questionnaire (Holistic Service Delivery to Older People by Local Government through ICT)

In 2017, funding was obtained to gather data about older South Africans' cell phone use to promote municipal service delivery. The small self-funded iGNiTe study was deliberately expanded to include a wider range of communities. Continuously revising and modifying a solution based on the outcomes of actions in order to address the problem appropriately is in line with a pragmatic approach (Dixon, 2019). Accordingly, the iGNiTe questionnaire was revised drawing on the results of the original statistical analyses and transdisciplinary consultation by the research team, which consisted of senior and junior researchers, as well as student fieldworkers, from subject disciplines: law, public administration, demography and population studies, development studies, social work, psychology, language studies, biokinetics, information systems and socio-gerontology (see Chap. 4 for a detailed discussion). Qualitative findings obtained from the iGNiTe study further informed revisions. The specific focus of the we-DELIVER project on service needs informed inclusion of items in this regard (https://we-deliver.github.io/team). In Version 2 (we-DELIVER), items were arranged in sections, and items with specific topics were added or revised for greater clarity. For example, reference to the use of

multimedia messaging services (MMSs) was removed, and questions about taking selfies and making voice recordings were added. Table 5.2 summarizes the changes made for the we-DELIVER questionnaire.

The we-DELIVER questionnaire was developed to obtain specific information about older individuals' cell phone use and their needs for municipal services. Five questions relevant to addressing the we-DELIVER project informed the revisions of Version 1:

1. Which cell phones and cell phone functionalities do older persons use in the context of multigenerational families?

   - To how many cell phones do older persons have access?
   - Which types of cell phones are used?
   - To whom do the cell phones belong?
   - Who else has access to the cell phones?
   - Who chose the cell phones being used?
   - Who pays for the data and airtime?

2. What are the cell phones used for?

   - Basic cell phone features?
   - Advanced cell phone features and imaging?
   - Internet-dependent cell phone features?
   - Care needs and relational regulation?

3. What is older persons' self-perceived competence (knowledge, skills, and attitudes) with regard to their use of cell phones?
4. What service needs are addressed by using a cell phone?
5. What are the intergenerational patterns around older persons' cell phone use?

### 5.3.1 Structure of the we-DELIVER Questionnaire

The structure of the we-DELIVER questionnaire (Version 2) is presented in Fig. 5.2.

- Biographical information: age, gender, level of education, living arrangements, and household size.
- About the cell phone: items related to access and ownership.
- Cell phone user patterns: participants' self-reported ability to use the phones' different features, categorized as basic, advanced, and internet-dependent.
- Cell phone user patterns: care and relational regulation consisted of items about reasons for using cell phones in relation to making and receiving contact with people. Specific items about social, health, and emergency service needs were included under this heading to answer the research questions guiding the we-DELIVER project.
- Perceived competence (knowledge, skills, and attitude).
- Intergenerational patterns: items about how contact is made, who is contacted, and frequency of contact.

**Table 5.2** Changes made to the iGNiTe questionnaire (Version 1) in developing the we-DELIVER questionnaire (Version 2)

| | Questionnaire section | Changes made | Motivation |
|---|---|---|---|
| 1. | Biographical information (incl. age, gender, location, living situation) | Some changes (e.g. questions on number of children, grandchildren and other people in the household were added) | Additions were made to get a better picture of the participants |
| 2. | Living standards measure (SU-LSM™) | Retained for a more nuanced depiction of the participants' living standards | No changes. Independent questionnaire |
| 3. | About the cell phone(s) | Some changes (e.g. questions were added on who chose the phone, who makes decisions about what happens on the phone; the option of rented phones was replaced with shared phones) | Changes were made to have more detailed information about older individuals' ownership and access to cell phones |
| 4. | Cell phone user patterns including 4 sub-sections | – The section was extended, revised, and categorized for ease of reporting (see changes under relevant sub-sections)<br>– In sub-sections (a) to (c) on the use of features, the answering format was changed: First, a choice between "Yes", "No", and "I ask someone to help me" was given, before the frequency of using or requesting help was asked ("A few times a day", "Once a day", "Once a week", "Once a month")<br>– Sub-section (d) was added to collect information on how older persons maintained certain relationships by using cell phones, and how they turned to specific people as resources in order to manage such use | Changes were made for more detailed information about participants' cell phone use, agency, and whom they ask for assistance |
| | (a) Basic features (5 questions) | – Questions were added about looking at the time, as well as the date and calendar | Changes to sub-sections (a) to (c) were based on removing items on outdated applications or statistical analysis of iGNiTe results, adding items on more recently developed cell phone technology and applications |
| | (b) Advanced features and imaging (8 questions) | – Questions were added on taking selfies, looking at photos on the cell phone, making voice recordings on WhatsApp, and setting reminders for appointments<br>– The question on using MMSs was removed, as was the option of using Mxit, with only the | |

(continued)

**Table 5.2** (continued)

| | Questionnaire section | Changes made | Motivation |
|---|---|---|---|
| | | option of using WhatsApp retained | |
| | (c) Internet-dependent features (7 questions) | – Questions were added relating to reading the latest news, using Google and cell phone or internet banking<br>– The questions on sending "Please call me" messages and using GPS were removed | |
| | (d) User patterns: Care needs and relational regulation (8 questions) | – Newly added sub-section<br>– Questions were added to establish motivation for using cell phones, types of communication (e.g. to have conversations or to ask for help)<br>– Specific questions were added about social, health, and emergency services | The addition of sub-section (d) was based on qualitative findings from the iGNiTe study. Specific items were added to address the question about service needs |
| 5. | (a) Knowledge, skills, and attitude | – This section was extended, revised, and categorized for ease of reporting (see changes under relevant sub-sections)<br>– Sub-sections (a) and (b) were added to collect information about knowledge and skills. Answer options included only "Yes" or "No"<br>– Sub-section (c) was extended with more questions on attitude, and existing questions were either adapted or removed. The scale of measurement ranged from 1 (Strongly disagree) to 4 (Strongly agree), based on the qualitative findings of the iGNiTe study and literature review Matteson et al., 2016) | The addition of sub-sections (a) and (b) was based on qualitative findings from the iGNiTe study<br>Changes to sub-section (c) were made in order to refine information collected specifically about attitude |
| | a. Knowledge (11 questions) | – Questions added included items on knowledge about switching the cell phone on and off, sending messages, and using the internet | |
| | b. Skills (6 questions) | – Questions added included items on ability to explain features easily to others, use almost all features, and check the airtime/data balance on cell phone | |
| | c. Attitude (13 questions) | – Questions were added to collect information about | |

**Table 5.2** (continued)

| | Questionnaire section | Changes made | Motivation |
|---|---|---|---|
| | | perceptions of cell phones as dangerous or useful, ease of use, preferences, etc. | |
| 6. | Intergenerational patterns (9 questions) | Section was extended to include reasons for contacting and being contacted by certain persons | To obtain more comprehensive insight into intergenerational support and contacts |
| 7. | Open-ended question | No changes were made | |
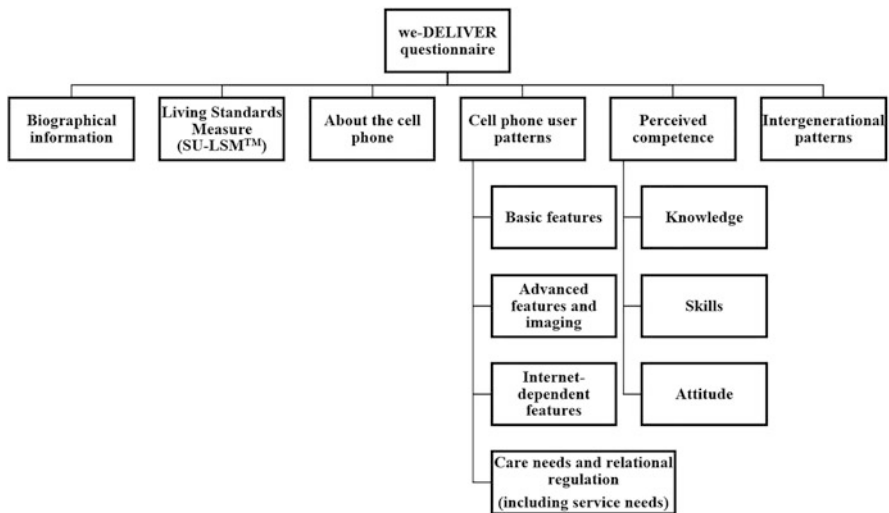


**Fig. 5.2** Structure of the we-DELIVER questionnaire

## 5.3.2  Translation and Pilot Study

Two socio-gerontologists (Vera Roos and Jaco Hoffman) with extensive research and practical experience of topics related to issues affecting the lives of older persons, together with a transdisciplinary research team (consisting of first- and second-language Setswana-speakers) formulated the additional and revised items for the we-DELIVER questionnaire. The questionnaire was translated from English into Setswana by researchers in African languages at the Mahikeng campus of the North-West University (NWU). Setswana is the main language used in Lokaleng and Ikageng, two of the selected communities. The translated version was given to 15 mother-tongue Setswana speakers to verify its comprehensibility by identifying ambiguous or unclear wording. It was translated back into English by a translator affiliated to the NWU language directorate. The transdisciplinary research team

compared the two English versions to check for accuracy and the appropriateness of the translation for the particular setting for which it was intended. This process was followed to check the language accuracy of linguistics experts who were not familiar with the target languages, to examine the quality of the translation, and to detect potential errors (see Foxcroft & Roodt, 2018).

After piloting the translated questionnaire with older persons ($n = 27$), the research team discussed issues related to the wording of items that lacked equivalent constructs in the indigenous languages. For example, there is no word in Setswana for "air conditioner". Another issue concerned the use of concepts that were not familiar in rural contexts, such as access to home security services (one of the SU-LSM™ questions); some participants in the pilot study responded affirmatively by saying that they owned a dog. The transdisciplinary input was used to revise, simplify, and finalize the questionnaire. Finally, to ensure consistent quality, a community psychologist, who was not part of the research team but was familiar with Setswana and the relevant sociocultural context, checked the questionnaire word by word to ensure that the phrasing would yield accurate information for addressing the research questions, and would also be easily understandable so as to encourage optimal participation. Revisions were made before the questionnaire was translated into Sesotho and isiZulu (the main languages used in the other target communities) by a lecturer affiliated to the languages department of the NWU's Vanderbijlpark campus and who was familiar with the vernacular and sociocultural context of the research communities.

### 5.3.3   Data Collection and Participants

Questionnaires were uploaded on digital devices (cell phones or tablets) and trained student fieldworkers captured the participants' responses ($n = 302$) on SurveyAnalytics (https://www.surveyanalytics.com).

Purposive sampling (see Patton, 2002) was used to select communities located close to the three NWU campuses (in Mahikeng, Potchefstroom and Vanderbijlpark). The older participants were selected by criterion sampling (see Patton, 2002) and included persons 50 years or older who had access to a cell phone, and who did not present with any observable cognitive impairments that would have prevented them from interacting coherently with the researchers. The older individuals who participated in the we-DELIVER project resided in Lokaleng, Ikageng, and Sharpeville (see Chap. 3 for a detailed discussion of the research communities), of whom 15 (5.0%) lived in unspecified areas. Four participants did not indicate where they live. Participation was skewed towards women; fewer than a quarter of the participants were male. In this sample, 70% of the participants had completed primary school educational levels or had no education, and only 2.0% had completed a postgraduate education. Almost half (48.2%) lived in households of 5 or more people, including those who lived with their children (54.9%) and/or their

grandchildren (57.2%). With regard to the SU-LSM™, only 7.4% reported LSM levels of 8 to 9, whereas the majority (75.6%) indicated levels 4 to 7, and almost a quarter noted LSM levels 1 to 3. Table 5.3 provides information about participants' characteristics.

### 5.3.4  Statistical Analyses and Results

Results of the data analyses are discussed in detail in Chap. 6, here results pertaining specifically to the revision of the we-DELIVER questionnaire are presented. They informed revisions and the development of Version 3 (AGeConnect). Included in this section, therefore, are the results for means with standard deviations, internal consistency, confirmatory factor analyses, and exploratory factor analyses.

#### 5.3.4.1  Descriptive Statistics and Reliability

SPSS 26 (IBM Corporation, 2020) was used to calculate the descriptive statistics and reliability coefficients. The means (M) are reported with their associated standard deviations (SD) to assist with interpretation of the meaningfulness of the calculated averages. The M for each variable is calculated according to that specific measurement scale and should therefore not be compared directly with other means. The generally recognized range for an acceptable SD is anywhere between $-1.00$ and $+1.00$. An SD outside that range is interpreted as being too widely distributed for its M to be meaningful (Field, 2018). Cronbach's alpha ($\alpha$) was used to compute reliability coefficients with a suggested cut-off point for acceptable reliability of 0.70 (Field, 2018). Reliabilities for subsections of the we-DELIVER questionnaire are provided with their descriptive statistics in Table 5.4.

The number of working cell phones per household was reported to be, on average, just above 2 ($M = 2.24$, $SD = 1.78$), with most participants indicating that they sometimes used a cell phone (Scale: 0–2; $M = 1.07$, $SD = 0.62$), especially its basic features (Scale: 0–3; $M = 2.45$, $SD = 0.89$). Advanced and internet-dependent features were used much less (Scale: 0–3; $M = 0.38$, $SD = 0.60$, and $M = 0.29$, $SD = 0.54$, respectively). Regarding levels of knowledge and skill as well as attitude toward cell phones, participants reported the following (on a scale of low, medium, high): Average self-perceived level of knowledge $= 1.64$ ($SD = 0.71$); Average self-perceived level of skill $= 1.40$ ($SD = 0.63$); and Average self-reported attitude toward cell phones $= 1.94$ ($SD = 0.97$).

There were two subsections in which reliability was found to be below the preferred 0.70 threshold: "Frequency of use of basic features" ($\alpha = 0.49$), and "Perceived level of skill" ($\alpha = 0.63$). "Frequency of use of advanced features" and "Frequency of use of internet-dependent features" resulted in acceptable alphas of 0.76 and 0.70, respectively. "Perceived level of knowledge" showed a reliability index of 0.87, while the subsection "Attitude" achieved an alpha of 0.83. On closer

**Table 5.3** Characteristics of the we-DELIVER participants ($n = 302$)

| Item | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 73 | 24.2 |
| | Female | 229 | 75.8 |
| Education | No education | 84 | 28,0 |
| | Primary school | 132 | 44,0 |
| | High school | 63 | 21,0 |
| | Matriculation certificate | 11 | 3.7 |
| | Degree/diploma | 4 | 1.3 |
| | Postgraduate | 6 | 2,0 |
| Area | Lokaleng | 103 | 34.6 |
| | Ikageng | 94 | 31.5 |
| | Sharpeville | 86 | 28.9 |
| | Other | 15 | 5.0 |
| Size of household | Living alone | 73 | 27.2 |
| | 2 persons | 19 | 7.1 |
| | 3 persons | 25 | 9.3 |
| | 4 persons | 22 | 8.2 |
| | 5 persons | 19 | 7.1 |
| | 6–7 persons | 45 | 16.8 |
| | 8–9 persons | 31 | 11.6 |
| | 10–14 persons | 27 | 10.1 |
| | 15–19 persons | 7 | 2.6 |
| Living with | Nobody else | 73 | 24.5 |
| | Spouse | 139 | 46.6 |
| | Children | 162 | 54.9 |
| | Grandchildren | 167 | 57.2 |
| | Siblings | 27 | 9.1 |
| | Parents | 2 | 0.7 |
| | Grandparents | 3 | 1,0 |
| | Friends | 4 | 1.4 |
| | Other people | 31 | 10.5 |
| LSM score | 1 | 7 | 2.4 |
| | 2 | 12 | 4.1 |
| | 3 | 31 | 10.5 |
| | 4 | 38 | 12.8 |
| | 5 | 56 | 18.9 |
| | 6 | 95 | 32.1 |
| | 7 | 35 | 11.8 |
| | 8 | 10 | 3.4 |
| | 9 | 9 | 3.0 |
| | 10 | 3 | 1.0 |

*Note.* Living with... percentage given out of 100% for each category presented in Table 5.3

**Table 5.4** Descriptive statistics and reliability coefficients

|     |                                                             | M    | SD   | α    |
|-----|-------------------------------------------------------------|------|------|------|
| 1.  | Size of household                                           | 4.97 | 3.80 | –    |
| 2.  | SU-LSM™ score (scale: 0–10)                                 | 5.28 | 1.75 | –    |
| 3.  | Number of working cell phones in the household             | 2.24 | 1.78 | –    |
| 4.  | Cell phone use frequency by participant (scale: 0–2)       | 1.07 | 0.62 | –    |
| 5.  | Feature use frequency (scale: 0–4)                          |      |      |      |
|     | – basic features                                           | 2.45 | 0.89 | 0.49 |
|     | – advanced features                                        | 0.38 | 0.60 | 0.76 |
|     | – internet-dependent features                              | 0.29 | 0.54 | 0.70 |
| 7.  | Perceived level of knowledge (scale: low, medium, high)    | 1.45 | 0.67 | 0.86 |
| 8.  | Perceived level of skill (scale: low, medium, high)        | 1.28 | 0.56 | 0.63 |
| 9.  | Attitude (scale: low, medium, high)                        | 1.94 | 0.97 | 0.83 |

M = Mean; SD = Standard deviation; α = Cronbach's alpha
Table 5.4 shows that, on average, about 5 persons lived in a household ($M = 4.97$, $SD = 3.80$) that averaged just above level 5 on the SU-LSM™ ($M = 5.28$, $SD = 1.75$). The averages seem reasonable; however, their distributions are large, and these two means should be interpreted accordingly

**Table 5.5** Fit statistics of confirmatory factor analyses

| Model                         | $\chi^2$ | df  | RMSEA | CFI | TLI | SRMR |
|-------------------------------|----------|-----|-------|-----|-----|------|
| Frequency of feature use      | Non-positive definite latent variable covariance matrix |  |  |  |  |  |
| Knowledge, skill, and attitude | 851.74   | 402 | 0.07  | 0.91 | 0.91 | 0.13 |

$\chi^2$ = chi-square; $df$ = degrees of freedom; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean square residual

inspection of the two unsatisfactory subsections, it was not possible to pinpoint any specific item in either that might have influenced their reliability coefficients negatively. Before adapting or removing items could be considered, however, model fit needed to be investigated.

## 5.3.4.2 Confirmatory Factor Analysis (CFA)

CFAs were conducted to attempt to confirm the proposed factor structures of the applicable latent variables of the we-DELIVER questionnaire. The robust maximum likelihood estimator (MLR) was specified, because it considers the skewness and kurtosis found in the data. CFAs were conducted for two subsections: "Frequency of use of features" (containing three factors: basic, advanced, and internet-dependent features) and "Knowledge, skill, and attitude" (three factors). For measurement of "Frequency of use of features" the scale *Never*, *Once a month*, *Once a week*, *Once a day*, and *A few times a day* was used, regardless of whether participants used it themselves or asked someone to help them. The results of the two CFAs are provided in Table 5.5. Fit statistics reported include chi-square ($\chi^2$; with lower values

indicating better fit) and degrees of freedom (*df*), as well as the root mean square error of approximation (RMSEA; acceptable <0.08; excellent <0.05), the comparative fit index (CFI; acceptable >0.90; excellent >0.95), the Tucker-Lewis index (TLI; acceptable >0.90; excellent >0.95), and the standardized root mean square residual (SRMR; acceptable <0.08) (Wang & Wang, 2020).

Neither of the two 1-factor models (Frequency of feature use, and Knowledge, skill, and attitude) could be used for further analysis. "Frequency of feature use" produced a non-positive definite latent variable covariance matrix, indicating a negative or residual variance for a latent variable, a correlation between two latent variables larger than or equal to 1.00, or a linear dependency among more than two latent variables. Also, even though "Knowledge, skill, and attitude" achieved acceptable levels for CFI, TLI and RMSEA, the SRMR value was too high (SRMR = 0.134). A correlation between Knowledge-item 11 (*I know how to check my cell phone balance*) and Skill-item 6 (*I can check my cell phone balance on my own*), was measured as 0.994, suggesting that these two items could be combined, as they were measuring the same information. Two Skill items and three Attitude-items did not load well on their respective factors (loadings should be $\beta > 0.35$), indicating that some items could be removed without jeopardizing the strength of the constructs. The high correlation between the variables Knowledge and Skill ($r = 0.989$) might also be an indication that participants did not distinguish between the two concepts, or that the phrasing of the items made the distinction unclear.

Because of the described problems with the two models, it was decided to carry out EFAs on the two factors (Frequency of feature use, and Knowledge, skill, and attitude).

### 5.3.4.3 Exploratory Factor Analysis

Mplus 8.6 (Muthén & Muthén, 1998–2021) was used to explore the factor structure of the items. The same steps were followed for both. First, an initial EFA was performed to ascertain the number of possible factors (with Eigenvalues >1.00) contained within the specified items. Then the number of factors to be extracted was specified and the resulting model fit compared. Last, a new factor structure was suggested, if needed, and items to be removed or adapted indicated.

***Frequency of Feature Use*** The three factors (Basic, Advanced, and Internet-dependent) contained 20 items in total. Corresponding with Eigenvalues larger than 1.00, one to five factors were programmed to be extracted from the 20 items. After inspection of the separate EFAs, it was found that the item "listen to the radio/music" did not load very strongly on a specific factor in any of the EFAs, but instead showed several significant cross-loadings between different possible factors. For future use the decision was made to split this item into "Listen to music" (under basic features) and "Listen to the radio" (under advanced and data-dependent features). This was because the participant could already have had music stored on the phone but would have to use data in order to connect to a radio station. Inspection of the possible

factor structure solutions extracted from the data included comparison of the models' Akaike information criteria (AICs) and sample-size adjusted Bayesian information criterion (ABICs) values (with lower values indicating better fit) (Wang & Wang, 2012). As model fit improves with the possibility of more factors, these comparisons had to be balanced with the patterns of significant loadings of the respective items for the five possible factor structure solutions. Finally, the most appropriate solution was to split the items into four factors for use in the next version of the questionnaire:

– Basic feature use (3 items: make and receive calls; look at the time; look at the date and calendar);
– Intermediate feature use (5 items: send and receive SMSs; use the alarm clock; set reminders, e.g. for appointments, to take medication; give and receive family news; listen to music saved on the cell phone);
– Advanced and data-dependent feature use (11 items: use WhatsApp etc.; play games; send voice notes e.g. on WhatsApp; use the calculator; send and receive email; use Google to search for information; access Facebook [and/or other social media platforms, e.g., Twitter, Instagram]; use internet banking; read local and/or international news; listen to the radio; Watch TV/videos, e.g. YouTube, Netflix); and
– Imaging feature use (3 items: take photos; take selfies; look at photos).

It was also apparent from the statistical results that participants sometimes not only used the features themselves, but also asked someone else for help. Therefore, the measurement scale was changed, and Yes and No replaced with categories to indicate frequencies. A choice of *Never* would indicate a No answer, but choosing any of the other options implied a Yes answer. The categories indicating frequency of feature use were also revised, because they referred to different time intervals, such as a day, a week, or a month. For consistency, the categories were changed to time intervals related to a month: Once a month, A few times a month, Every day of the month. The same time intervals were also used to indicate the how often the participants would ask others to assist them with cell phone features.

**Perceived Knowledge and Skill** The 17 items of perceived levels of knowledge and skill were used to determine the possible number of factors they contained. The applicable Eigenvalues indicated a possibility of three factors. The outcomes of the EFAs showed that two items either did not load significantly at all or cross-loaded significantly on the explored factors: "I require assistance to explore new features" and "I am not competent enough to use all my cell phone features". These items were removed. As seen from the CFA results, the participants did not seem to distinguish between knowledge and skill. It was decided to change the format of the answers and provide three options in order to gather information on the two concepts combined: "Not at all", "With difficulty", and "With ease". After each grouping of items, a question was added regarding the participant's interest in learning more about the combination of features.

The best solution was to split the remaining 15 items into three factors for the new version of the questionnaire:

- Basic competence (4 items: Can you: switch a cell phone on and off; make calls; operate cell phone independently, and lock and unlock). The question whether participants would like to learn more about the basic features was added;
- Advanced competence (8 items: Can you: send messages; use advanced features, e.g. WhatsApp, Facebook; take photos; create new contacts; connect to the internet; explain different features to others; use almost all features; and use new features). The question whether participants would like to learn more about the advanced features was added; and
- Data/airtime management competence (4 items: Can you: upload airtime; buy airtime using a cell phone; buy data using the cell phone; and check the airtime/data balance). The added question was also included to determine if participants would like to learn more about the data/airtime management features.

*Attitude* This was measured with 13 items, which were used in an EFA to determine if there might be more than one factor present within the construct. Based on Eigenvalues higher than 1.00, three factors were possible. Two items did not load significantly onto any factor for any factor combination: "I see my cell phone as a dangerous gadget" and "I don't like cell phones", and they were removed from the revised questionnaire.

A three-factor solution was suggested by the EFA outcomes, which also complements the theoretical base of three components of attitude (Matteson et al., 2016):

- Affective component (How do you feel about cell phones) (4 items: I like cell phones; I like to use a cell phone; my cell phone is easy to use; my cell phone is very important to me);
- Cognitive component (How do you think about cell phones?) (5 items: A cell phone makes things easier; a cell phone is a wonderful instrument for communicating with people; a cell phone is helpful in reminding me of important things, e.g. appointments; I prefer less complex cell phones; I prefer pushbuttons, not touchscreens);
- Behavioural component (Why do you use cell phones?) (3 items: A cell phone makes me more independent; a cell phone makes me feel competent; I learn new things on cell phones).

Results of the statistical analysis, transdisciplinary input and consideration of relevant literature and theory, informed the revision of the we-DELIVER questionnaire to develop AG*e*Connect. Changes made are presented in Table 5.6.

**Table 5.6** Changes to the we-DELIVER questionnaire to inform the AG*e*Connect questionnaire

| Section | Sub-section/Description | Changes | Motivation |
|---|---|---|---|
| 1. Biographical information (heading added) | 1.1 Age What was your age on your last birthday? | Question reworded. Online: Predetermined options ranging from 50–120 included | "Year of birth" created confusion; predetermined options limit incorrect transmission of information |
| | 1.2 Language What language is predominantly spoken in your home? | Add item with 11 official South African languages | Language is used here as proxy for sociocultural context |
| | 1.3 Gender | "Other (please specify)" was added | To accommodate self-identified gender preference |
| | 1.4 Place of residence What is the name of the place where you live? | Question reworded | To limit confusion about place of residence and temporary place (for example, when visiting) |
| | 1.5 Highest level of education | Options were added | A range of categories allows for detail about different educational levels |
| | SU-LSM™ to determine the standards of living of participants (https://www.eighty20.co.za/lsm-calculator/) | Complete independent questionnaire excluded | Questionnaire is specific to South Africa |
| 2. Household structure (heading added) | 2.1 Do you live alone? | No change in item | – If yes, exclude irrelevant questions – If no, obtain number of people Online: choose predetermined categories |
| | 2.2 With whom of the following people do you live? | Wording was changed to refine question | Repetition of different options extended the time of completion; predetermined categories were refined to include all possibilities, without unnecessary repetition |
| 3. Cell phone information, use and access (heading revised) | 3.1 How many working cell phones are there in the household? | Question reworded | Edited for clarity |
| | 3.2 To whom does each cell phone belong? | Item and categories added | To determine access and ownership more specifically; relevant to planning interventions |
| | 3.3 How often do you use a cell phone? | No change. Time intervals of responses were changed | To ensure consistent comparable time intervals across questionnaire |

**Table 5.6** (continued)

| Section | Sub-section/Description | Changes | Motivation |
|---|---|---|---|
| | 3.4 By "never" do you mean: | Item was added | Clarity needed for what is meant by "never", to ensure it meant that participants did not use cell phones at all, and to give option to opt out of questionnaire |
| | 3.5 Is the cell phone that you mostly use: | Wording of item revised; constructs 'borrow' and 'share' were reworded: – borrow (not your own but someone else's that you can use) – Share (your own and you share it with other people) | To focus on the cell phone mostly used and to avoid confusion with semantics |
| | 3.6 If the cell phone belongs to you, who chose it for you? | Wording of item revised; more categories added | Question was edited for clarity about choice and agency in acquiring the device; categories were informed by data analysis |
| | 3.7 Did you want this phone? | No change | Not applicable |
| | 3.8 Please provide a reason for your previous answer | Options to explain Yes/No were added | Reasons for Yes/No provide detail related to the choice of the cell phone. |
| | 3.9 Whose cell phone do you mainly use? | Item reworded; more categories added | To prevent confusion with semantics; categories were informed by data analysis |
| | 3.10 With whom do you mainly share the cell phone? | Item reworded; more categories added | To prevent confusion with semantics; categories were informed by data analysis |
| | 3.11 Regardless of whether the cell phone is your own, borrowed, or shared, who decides what can be done on the cell phone? | Item reworded | To clarify the question; to determine access |
| | 3.12 What type of cell phone do you mostly use? | Item reworded | Difficult to determine the type of phone from photos; categories were informed by data analysis |
| | 3.13 Who is your service provider? | Item added | Information could be used for funding applications |

**Table 5.6**  (continued)

| Section | Sub-section/Description | Changes | Motivation |
|---|---|---|---|
| | 3.14 How are the network services paid for? | Wording revised | Question was language edited |
| | 3.15 Who mainly pays for the network services/airtime/data? | Item reworded; categories refined | To clarify the question; to identify the person who mainly pays for it; categories were informed by data analysis |
| | 3.16 In your view, what is the most important reason for having a cell phone? | No change to item; predetermined categories added | To clarify the question; categories were informed by data analysis |
| | 3.17 What do you use the cell phone primarily for? | Item reworded; predetermined categories added | Open-ended answers yielded confusing results; categories were informed by data analysis |
| | 3.18 What do you do when you experience difficulties with your cell phone? | No change; one category was reworded | Category was language edited |
| 4. Cell phone user patterns (heading revised) | 4.1 Basic feature use 4.2 Intermediate feature use 4.3 Advanced and data-dependent feature use 4.4 Imaging feature use | Items and categories revised; time intervals changed | Statistical analysis informed item structure; some cell phone feature use was outdated; to ensure consistent comparable time intervals across questionnaire |
| 5. Competence (no change) | 5.1 Basic competence 5.2. Advanced competence 5.3. Data/airtime management competence | Items and categories revised; time intervals changed | Statistical analysis informed the item structure; to ensure consistent comparable time intervals across questionnaire |
| 6. Attitude (no change) | 6.1 How do you feel about cell phones 6.2 What do you think about cell phones 6.3 Why do you use cell phones | Items and categories revised | Statistical analysis informed the item structure; literature informed revisions |
| 7. Interpersonal contact using cell phones (heading revised) | 7.1 What do you do when you receive a call? | Item was split into separate questions about call and text; more categories were added | To avoid double-barrelled question; more options to identify helping person more accurately; analysis of data informed more options |
| | 7.2 Why would you choose that (those) specific person(s)? (Choose one or two options only.) | Wording changed | Edited for clarity; more options to obtain an accurate description of why a particular person is asked; analysis of data informed more options |

(continued)

**Table 5.6** (continued)

| Section | Sub-section/Description | Changes | Motivation |
|---|---|---|---|
| | 7.3 What do you do when you receive a text? | See 7.1 | See 7.1 |
| | 7.4 Why would you choose that (those) specific person(s)? (Choose one or two options only.) | Wording changed | Edited for clarity; more options to get an accurate description of why a particular person is asked; analysis of data informed more options |
| | 7.5 Whom do you phone if you need urgent help? | Wording changed; options refined | Edited for clarity; to cover most likely options |
| | 7.6 Why would you choose that (those) specific person(s)? | Item added | To get an accurate description of why a particular persons is asked |
| | 7.7 Whom do you contact just to talk to? | Item reworded. More categories were added | Question was edited for clarity; categories were informed by data analysis |
| | 7.8 Whom do you mainly ask for help with your cell phone? | Item reworded. More categories were added | Question was edited for clarity; categories were informed by data analysis |
| | 7.9 Why do you ask that (those) specific person(s)? | Item reworded. More categories were added | To clarify question; to get an accurate description of why a particular person is asked; categories were informed by data analysis |
| | 7.10 How old are the people you mainly ask for help to use a cell phone? | Item added | To identify inter/intragenerational patterns of assistance |
| | 7.11 What is the general attitude of people when you ask them to help you with a cell phone? | Item reworded. Options were linked to specific age categories | To identify inter/intragenerational patterns of assistance |
| | 7.12 What do people generally do when you ask them for help with a cell phone? | Item reworded. Options were linked to specific age categories | Question was edited; to identify nature of inter/intragenerational patterns of assistance |
| | 7.13 Do people expect anything in return for their help? | Item reworded | Question was edited for clarity |
| | 7.14 How often do you contact the following people on a cell phone? | Item reworded. More categories were added | Question was edited for clarity; categories were informed by data analysis; consistency of time intervals across questionnaire |
| | 7.15 Why do you contact these people? | More categories were added | Categories were informed by data analysis |
| | | | To determine reciprocity of contact; consistency of |

**Table 5.6** (continued)

| Section | Sub-section/Description | Changes | Motivation |
|---|---|---|---|
| | 7.16 How often are you contacted on a cell phone by the following people? | Item was added with categories and time intervals | time intervals across questionnaire |
| | 7.17 Why are you contacted by these people? | Item was reworded. More categories were added | Question was edited; categories were informed by data analysis |
| | Do you or someone else on your behalf use the cell phone to get information about services (a list of social and healthcare services) | All items were removed | The focus of the we-DELIVER questionnaire was to obtain specific information about older participants' service needs. The AGeConnect questionnaire has a different focus |
| 8.Open-ended question | How did you experience the data-collection process? | No change | Not applicable |

## 5.4  AGeConnect Questionnaire (Age-Inclusive eConnections Between Generations for Interventions and Cell Phone Technology)

Here we present the AGeConnect questionnaire (Roos et al., 2022). The online version (https://ageconnect.questionpro.com/) has self-directed instructions, but for the MS Word version at the end of the chapter we suggest application guidelines.

### 5.4.1  Structure of the AGeConnect Questionnaire

The structure in Fig. 5.3 presents the different sections of the questionnaire:

– Biographical information: age, language, gender, place of residence, level of education;
– Household structure: living arrangements;
– Cell phone information, use and access: items related to access and ownership;
– Cell phone user patterns: use of specific cell phone features, divided into four subsections: Basic, Intermediate, Advanced and data-dependent, and Imaging features;
– Competence: divided into three subsections: Basic, Advanced, and Data/airtime management competence;
– Attitude: divided into Affective component (What do you feel about cell phones?), Cognitive component (What do you think about cell phones?), and Behavioural component (Why do you use cell phones?);
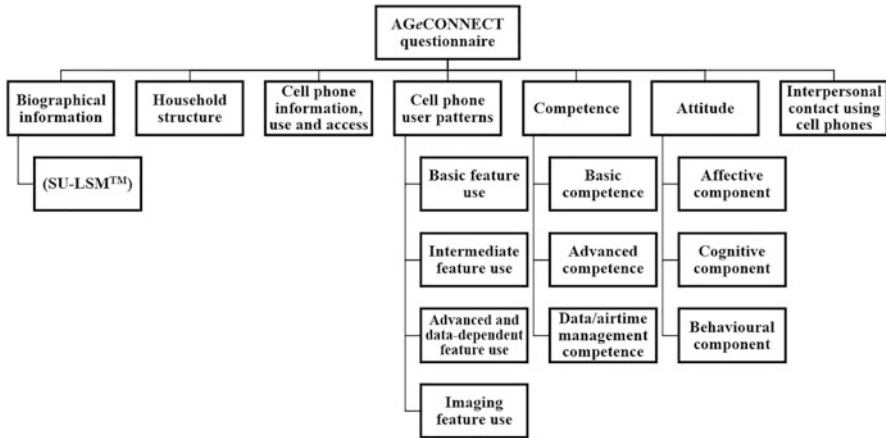
**Fig. 5.3** Structure of the AG*e*Connect questionnaire
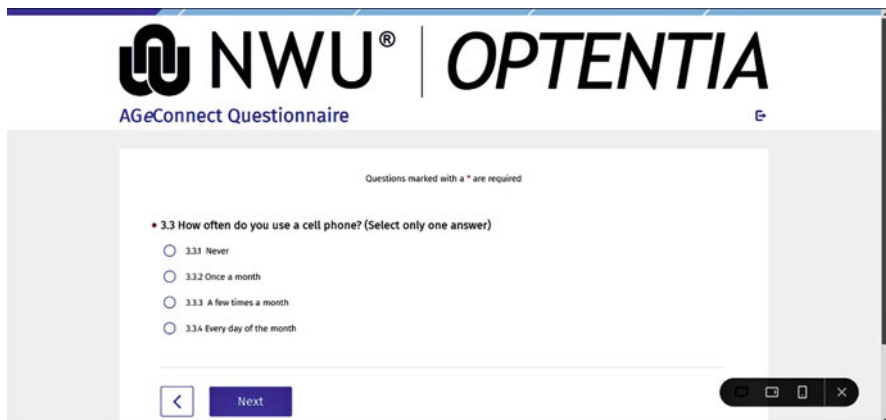


**Fig. 5.4** Screenshot of question showing various options

– Interpersonal contact using cell phones: items related to actions performed to make contact with, and be contacted by, other people;
– An open-ended question at the end of the questionnaire asked older participants how they had experienced participating in a technology-based questionnaire about their cell phone use.

In the construction of the online questionnaire, certain logics were used to allow users to skip irrelevant questions to save time based on their answers. This process is illustrated in Fig. 5.4 where the question asks older participants how often they use a cell phone. If a participant selects the option "Never", irrelevant follow-up questions
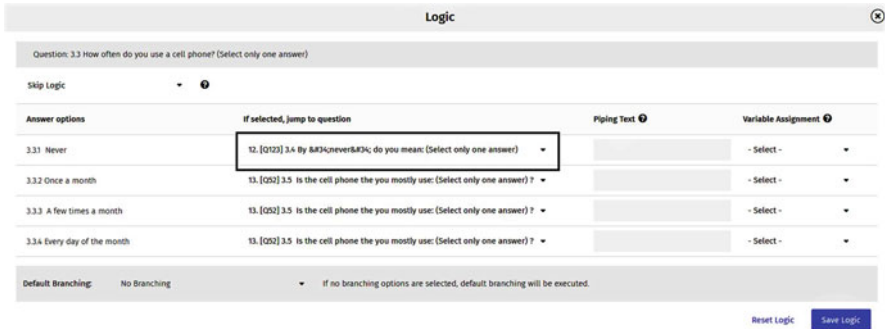
**Fig. 5.5** Screenshot of back-end programming with the instruction to skip irrelevant options and move on to the next question

are excluded, as illustrated in Fig. 5.5, which shows the back-end programming with the instruction to skip to the next relevant question.

## 5.4.2 Guidelines for Using the AGeConnect Questionnaire

The purpose of the AG*e*Connect questionnaire was to gather information on how older persons use cell phones in relation to their close and distant social relationships, their care and social needs, and their perceived levels of competence to use basic and advance cell phone features.

Items under specific headings can be revised to fit the specific context, such as:

– Biographical information

   • Which language is predominantly spoken in your home?
   • What is the name of the place where you live?
   • What is your highest level of education?

– Cell phone information, use and access

   • Who is your service provider?
   • How are the network services paid for?

The AG*e*Connect questionnaire was designed for digital completion by the participants themselves or with the assistance of trained (younger) fieldworkers. In the digital version (compiled on QuestionPro https://www.questionpro.com), when a question is answered, the applicable follow-up questions open and irrelevant questions are skipped.

Training for younger people on how to use the questionnaire should include ways to create an optimal interpersonal context before setting out to capture older participants' responses on digital devices (see Chap. 7). Although the questionnaire was designed to be completed in a conversational manner, younger facilitators need

consciously to refrain from using leading prompts. It is also recommended that younger people who administer the questionnaire should be familiar with the vernacular and sociocultural context of the older participants (see Chap. 3).

When collecting data, the younger facilitators should select only the relevant option and not offer all possible answers provided for a particular question. For example, in response to item 3.6: "If the cell phone belongs to you, who chose it for you?" the participant could respond "My friend", which informs a follow-up question, such as: "Is your friend younger or older than you or the same age as you?" Based on the answer, the person administering the questionnaire would then capture the relevant response. The final question relating to how older participants experienced the data collection session reveals descriptive qualitative data. The rationale for including this question was to allow for coding and for improving items or the process of application for future purposes. In addition, it was intended as a means for obtaining valuable insight into this age-inclusive manner of data collection.

The questionnaire may be used by any researcher interested in the fields of gerontology or the utilization of mobile technology. Build into the design is its potential to be revised for addressing related research questions in future. As such, the version of AG*e*Connect described in this chapter represents opportunities for continuing work in progress, and should not be regarded as final.

## 5.5  Conclusion

Promoting age-integrated societies and communities effectively through technology depends on including people of all ages in age-appropriate and context-specific ways. Achieving this ideal calls for knowledge of older individuals' cell phone use to enable inclusivity, and, where relevant, through supportive facilitation by younger people who are familiar with the sociocultural contexts of the older persons. This approach not only yields useful data to develop technology artefacts or for planning interventions, but also demonstrates technology use and through facilitated intergenerational engagement in optimal interpersonal contexts can help to get the buy-in of older adults for use of such technology in future.

This chapter ventured into the uncharted territory of self-designed questionnaire development to capture older individuals' responses regarding their cell phone use in a context characterized by diversity. The longitudinal development of our data-collection tool is transparently reported, as we designed and revised our questionnaires to fit their specific purpose. The rigorous processes that we followed to ensure reliability and validity included: statistical analyses, transdisciplinary input, consultation of recent literature reviews (including context-relevant qualitative studies), and inclusion of items based on relevant theory. This part of the larger study sets the scene for using the first—to our knowledge—online, digital questionnaire for the South African context, with the aim of yielding much-needed quantifiable information about older individuals' cell phone use as the basis for developing *e*Interventions. Finally, by investigating the psychometric properties of the

AG*e*Connect (Version 3) questionnaire, we invite revisions to stay abreast of ever-evolving technology developments and to find creative and effective ways—for example, through trained younger people who can offer supportive facilitation—to deal with the digital divide and to keep advancing older individuals' inclusivity.

## AG*e*Connect QUESTIONNAIRE

The purpose of the AG*e*Connect questionnaire is to gather information on the ways older persons use mobile technology in their physical and social environments, and on their levels of competence and their attitudes.

The questionnaire is meant to be completed electronically, whether by the participants themselves or with the assistance of trained fieldworkers.

1. Biographical information

1.1. What was your age on your last birthday? _____

1.2. What language is predominantly spoken in your home? (Select only one answer).

| 1.2.1. Afrikaans | ☐ |
|---|---|
| 1.2.2. English | ☐ |
| 1.2.3. isiNdebele | ☐ |
| 1.2.4. isiXhosa | ☐ |
| 1.2.5. isiZulu | ☐ |
| 1.2.6. Sepedi | ☐ |
| 1.2.7. Sesotho | ☐ |
| 1.2.8. Setswana | ☐ |
| 1.2.9. siSwati | ☐ |
| 1.2.10. Tshivenda | ☐ |
| 1.2.11. Xitsonga | ☐ |
| 1.2.12. Other (please specify) | ☐ |

1.3 What is your gender? (Select only one answer)

| 1.3.1. Male | ☐ |
|---|---|
| 1.3.2. Female | ☐ |
| 1.3.3. Other (please specify) | ☐ |

1.4. What is the name of the place where you live?
_____.

1.5. What is your highest level of education? (Select only one answer)

| 1.5.1. No formal education | ☐ |
|---|---|
| 1.5.2. Some primary school | ☐ |
| 1.5.3. Completed primary school | ☐ |

(continued)

| | |
|---|---|
| 1.5.4. Some high/secondary school | ☐ |
| 1.5.5. Completed high/secondary school | ☐ |
| 1.5.6. Some post-school education/training | ☐ |
| 1.5.7. Completed post-school certificate/training | ☐ |
| 1.5.8. Completed degree/diploma | ☐ |
| 1.5.9. Completed postgraduate studies | ☐ |

## 2. Household structure

2.1. Do you live alone? (Select only one answer)

| | | | |
|---|---|---|---|
| 2.1.1 Yes (Skip to Q3.1) | ☐ | 2.1.2 No | ☐ |

2.2. With whom of the following people do you live? (Include number for each relevant option)

| | |
|---|---|
| 2.2.1. Spouse | ☐ |
| 2.2.2. Children | ☐ |
| 2.2.3. Grandchildren | ☐ |
| 2.2.4. Other younger people | ☐ |
| 2.2.5. Other older people | ☐ |

## 3. Cell phone information, use, and access

3.1. How many working cell phones are there in the household?
_____.

3.2. To whom does each cell phone belong? (Answer more than one option as relevant)

| | |
|---|---|
| 3.2.1. To me | ☐ |
| 3.2.2. Spouse | ☐ |
| 3.2.3. Children | ☐ |
| 3.2.4. Grandchildren | ☐ |
| 3.2.5. Other younger people | ☐ |
| 3.2.6. Other older people | ☐ |

3.3. How often do you use a cell phone? (Select only one answer)

| | |
|---|---|
| 3.3.1. Never (Skip to Q3.4) | ☐ |
| 3.3.2. Once a month (Skip to Q3.5) | ☐ |
| 3.3.3. A few times a month (Skip to Q3.5) | ☐ |
| 3.3.4. Every day of the month (Skip to Q3.5) | ☐ |

3.4. By "never" do you mean: (Select only one answer)

| | |
|---|---|
| 3.4.1. I never use it | ☐ |
| 3.4.2. I don't want one | ☐ |
| 3.4.3. I always ask someone else to use a cell phone on my behalf | ☐ |
| 3.4.4. I don't have a cell phone, and I never use or borrow someone else's (skip to Q8) | ☐ |

3.5. Is the cell phone that you mostly use: (Select only one answer)

| | |
|---|---|
| 3.5.1. Your own<br>(Skip to Q3.6, Q3.7, and Q3.8) | ☐ |
| 3.5.2. Not your own but someone else's which you can use<br>(Skip to Q3.9) | ☐ |
| 3.5.3. Your own and you share it with other people (Skip to Q3.10) | ☐ |

3.6. If the cell phone belongs to you, who chose it for you? (Select only one answer)

| | |
|---|---|
| 3.6.1. Myself | ☐ |
| 3.6.2. Spouse | ☐ |
| 3.6.3. Children | ☐ |
| 3.6.4. Grandchildren | ☐ |
| 3.6.5. Friend(s) younger than me | ☐ |
| 3.6.6. Friend(s) of my age | ☐ |
| 3.6.7. Friend(s) older than me | ☐ |
| 3.6.8. Younger family member(s) | ☐ |
| 3.6.9. Family member(s) of my age | ☐ |
| 3.6.10. Older family member(s) | ☐ |
| 3.6.11. Employer (work) | ☐ |
| 3.6.12. Other (please specify) | ☐ |

3.7. Did you want this cell phone? (Select only one answer)

| | |
|---|---|
| 3.7.1. Yes (Skip to Q3.8.1. For reasons) | ☐ |
| 3.7.2. No (Skip to Q3.8.2. For reasons) | ☐ |
| 3.7.3. Unsure (Skip to Q3.9) | ☐ |

3.8. Please provide a reason for your previous answer.
3.8.1. Please provide a reason for your previous Yes answer.
(Choose one or two options only) (Skip to Q3.11)

| | |
|---|---|
| 3.8.1.1. As a replacement | ☐ |
| 3.8.1.2. It is easy to use | ☐ |
| 3.8.1.3. It is affordable | ☐ |
| 3.8.1.4. It is strong (durable) | ☐ |
| 3.8.1.5. I liked it | ☐ |
| 3.8.1.6. Other (please specify) | ☐ |

3.8.2. Please provide a reason for your previous No answer.
(Choose one or two options only) (Skip to Q3.11)

| | |
|---|---|
| 3.8.2.1. I wanted another cell phone | ☐ |
| 3.8.2.2. I don't know how to use it | ☐ |

| 3.8.2.3. I don't have any use for it | ☐ |
|---|---|
| 3.8.2.4. I didn't choose it | ☐ |
| 3.8.2.5. Other (please specify) | ☐ |

3.9. Whose cell phone do you mainly use?
(Choose one or two options only) (Skip to Q3.11)

| 3.9.1. Spouse | ☐ |
|---|---|
| 3.9.2. Children | ☐ |
| 3.9.3. Grandchildren | ☐ |
| 3.9.4. Friend(s) younger than me | ☐ |
| 3.9.5. Friend(s) of my age | ☐ |
| 3.9.6. Friend(s) older than me | ☐ |
| 3.9.7. Younger family member(s) | ☐ |
| 3.9.8. Family member(s) of my age | ☐ |
| 3.9.9. Older family member(s) | ☐ |
| 3.9.10. Employer (work) | ☐ |
| 3.9.11.Other (please specify) | ☐ |

3.10. With whom do you mainly share the cell phone? (Choose one or two options only)

| 3.10.1. Spouse | ☐ |
|---|---|
| 3.10.2. Children | ☐ |
| 3.10.3. Grandchildren | ☐ |
| 3.10.4. Friend(s) younger than me | ☐ |
| 3.10.5. Friend(s) of my age | ☐ |
| 3.10.6. Friend(s) older than me | ☐ |
| 3.10.7. Younger family member(s) | ☐ |
| 3.10.8. Family member(s) of my age | ☐ |
| 3.10.9. Older family member(s) | ☐ |
| 3.10.10. Employer (work) | ☐ |
| 3.10.11. Other (please specify) | ☐ |

3.11. Regardless of whether the cell phone is your own, borrowed, or shared, who decides what can be done on the cell phone? (Select only one answer)

| 3.11.1.Myself | ☐ |
|---|---|
| 3.11.2.Other people | ☐ |

3.12.What type of cell phone do you mostly use? (Select only one answer)

| 3.12.1. Pushbutton | ☐ |
|---|---|
| 3.12.2. Touchscreen | ☐ |

### 3.13. Who is your service provider? (Select all relevant options)

| | |
|---|---|
| 3.13.1. Vodacom | ☐ |
| 3.13.2. MTN | ☐ |
| 3.13.3.Cell C | ☐ |
| 3.13.4. Telkom | ☐ |
| 3.13.5. Other (please specify) | ☐ |

### 3.14. How are the network services paid for? (Select all relevant options)

| | |
|---|---|
| 3.14.1. A contract | ☐ |
| 3.14.2. Pay-as-you-go | ☐ |
| 3.14.3. Top-up | ☐ |

### 3.15. Who mainly pays for the network services/airtime/data? (Select only one answer)

| | |
|---|---|
| 3.15.1. Myself | ☐ |
| 3.15.2. Spouse | ☐ |
| 3.15.3. Children | ☐ |
| 3.15.4. Grandchildren | ☐ |
| 3.15.5. Friend(s) younger than me | ☐ |
| 3.15.6. Friend(s) of my age | ☐ |
| 3.15.7. Friend(s) older than me | ☐ |
| 3.15.8. Younger family member(s) | ☐ |
| 3.15.9. Family member(s) of my age | ☐ |
| 3.15.10. Older family member(s) | ☐ |
| 3.15.11. Employer (work) | ☐ |
| 3.15.12. Other (please specify) | ☐ |

### 3.16. In your view, what is the most important reason for having a cell phone? (Choose one or two options only)

| | |
|---|---|
| 3.16.1. Because my spouse/children/family insist/s | ☐ |
| 3.16.2. To make my life easier | ☐ |
| 3.16.3. To contact other people | ☐ |
| 3.16.4. To be contacted by other people | ☐ |
| 3.16.5. For emergency situations | ☐ |

### 3.17. What do you use the cell phone primarily for? (Select only one answer)

| | |
|---|---|
| 3.17.1. Communication | ☐ |
| 3.17.2. Provide and/or receive help | ☐ |
| 3.17.3. Assistance with daily responsibilities/tasks/errands | ☐ |
| 3.17.4. Other (please specify) | ☐ |

3.18. What do you do when you experience difficulties with your cell phone? (Choose one or two options only)

| | |
|---|---|
| 3.18.1. Leave it | ☐ |
| 3.18.2. Try to figure it out | ☐ |
| 3.18.3. Read the manual | ☐ |
| 3.18.4. Ask for help | ☐ |
| 3.18.5. Google the problem | ☐ |
| 3.18.6. Other (please specify) | ☐ |

## 4. Cell phone user patterns
4.1. Basic feature use

4.1.1 How often do you use a cell phone to: (Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.1.1.1. Make and receive calls | ☐ | ☐ | ☐ | ☐ |
| 4.1.1.2. Look at the time | ☐ | ☐ | ☐ | ☐ |
| 4.1.1.3. Look at the date and calendar | ☐ | ☐ | ☐ | ☐ |

4.1.2. How often do you ask someone to help you to: (Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.1.2.1. Make and receive calls | ☐ | ☐ | ☐ | ☐ |
| 4.1.2.2. Look at the time | ☐ | ☐ | ☐ | ☐ |
| 4.1.2.3. Look at the date and calendar | ☐ | ☐ | ☐ | ☐ |

4.2. Intermediate feature use

4.2.1 How often do you use a cell phone to: (Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.2.1.1. Send and receive SMSs | ☐ | ☐ | ☐ | ☐ |
| 4.2.1.2. Use the alarm clock | ☐ | ☐ | ☐ | ☐ |
| 4.2.1.3. Set reminders, e.g. for appointments, to take medication | ☐ | ☐ | ☐ | ☐ |
| 4.2.1.4. Give and receive family news | ☐ | ☐ | ☐ | ☐ |
| 4.2.1.5. Listen to music saved on the cell phone | ☐ | ☐ | ☐ | ☐ |

4.2.2. How often do you ask someone to help you to:
(Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.2.2.1. Send and receive SMSs | ☐ | ☐ | ☐ | ☐ |
| 4.2.2.2. Use the alarm clock | ☐ | ☐ | ☐ | ☐ |
| 4.2.2.3. Set reminders, e.g. for appointments, to take medication | ☐ | ☐ | ☐ | ☐ |
| 4.2.2.4. Give and receive family news | ☐ | ☐ | ☐ | ☐ |
| 4.2.2.5. Listen to music saved on the phone | ☐ | ☐ | ☐ | ☐ |

4.3. Advanced and data-dependent feature use
4.3.1. How often do you use a cell phone to: (Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.3.1.1. Use WhatsApp | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.2. Play games | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.3. Send voice notes on, e.g. WhatsApp | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.4. Use the calculator | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.5. Send and receive email | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.6. Use Google to search for information | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.7. Access Facebook (and/or other social media platforms, e.g. twitter, Instagram) | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.8. Use internet banking | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.9. Read local and/or international news | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.10. Listen to the radio | ☐ | ☐ | ☐ | ☐ |
| 4.3.1.11. Watch TV/videos, e.g. YouTube, Netflix | ☐ | ☐ | ☐ | ☐ |

4.3.2. How often do you ask someone to help you to:
(Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.3.2.1. Use WhatsApp | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.2. Play games | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.3. Send voice notes on, e.g. WhatsApp | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.4. Use the calculator | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.5. Send and receive email | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.6. Use Google to search for information | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.7. Access Facebook (and/or other social media platforms, e.g. twitter, Instagram) | ☐ | ☐ | ☐ | ☐ |

| | | | | |
|---|---|---|---|---|
| 4.3.2.8. Use internet banking | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.9. Read local and/or international news | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.10. Listen to the radio | ☐ | ☐ | ☐ | ☐ |
| 4.3.2.11. Watch TV/videos, e.g. YouTube, Netflix | ☐ | ☐ | ☐ | ☐ |

4.4. Imaging feature use
4.4.1 How often do you use a cell phone to: (Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.4.1.1. Take photos | ☐ | ☐ | ☐ | ☐ |
| 4.4.1.2. Take selfies | ☐ | ☐ | ☐ | ☐ |
| 4.4.1.3. Look at photos | ☐ | ☐ | ☐ | ☐ |

4.4.2. How often do you ask someone to help you to:
(Select only one answer)

| | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 4.4.2.1. Take photos | ☐ | ☐ | ☐ | ☐ |
| 4.4.2.2. Take selfies | ☐ | ☐ | ☐ | ☐ |
| 4.4.2.3. Look at photos | ☐ | ☐ | ☐ | ☐ |

**5. Competence**
5.1. Basic competence
5.1.1. Can you: (Select only one answer)

| | Not at all | With difficulty | With ease |
|---|---|---|---|
| 5.1.1.1. Switch a cell phone on and off | ☐ | ☐ | ☐ |
| 5.1.1.2. Make calls | ☐ | ☐ | ☐ |
| 5.1.1.3. Operate a cell phone independently | ☐ | ☐ | ☐ |
| 5.1.1.4. Lock and unlock a cell phone | ☐ | ☐ | ☐ |
| 5.1.1.5. Do you want to learn more about any of these basic features? | Yes ☐ no ☐ | | |

5.2. Advanced competence
5.2.1. Can you: (Select only one answer)

| | Not at all | With difficulty | With ease |
|---|---|---|---|
| 5.2.1.1. Send messages (SMSs) | ☐ | ☐ | ☐ |
| 5.2.1.2. Use advanced features, e.g. WhatsApp, Facebook | ☐ | ☐ | ☐ |
| 5.2.1.3. Take photos | ☐ | ☐ | ☐ |

| | | | |
|---|---|---|---|
| 5.2.1.4. Create new contacts | ☐ | ☐ | ☐ |
| 5.2.1.5. Connect to the internet, e.g. Google | ☐ | ☐ | ☐ |
| 5.2.1.6. Explain different cell phone features to others | ☐ | ☐ | ☐ |
| 5.2.1.7. Use almost all cell phone features | ☐ | ☐ | ☐ |
| 5.2.1.8. Use new features on a cell phone | ☐ | ☐ | ☐ |
| 5.2.1.9. Do you want to learn more about any of these advanced features? | Yes ☐ no ☐ | | |

### 5.3. Data/airtime management competence
5.3.1. Can you: (Select only one answer)

| | Not at all | With difficulty | With ease |
|---|---|---|---|
| 5.3.1.1. Upload airtime | ☐ | ☐ | ☐ |
| 5.3.1.2. Buy airtime using a cell phone | ☐ | ☐ | ☐ |
| 5.3.1.3. Buy data using a cell phone | ☐ | ☐ | ☐ |
| 5.3.1.4. Check airtime/data balance | ☐ | ☐ | ☐ |
| 5.3.1.5. Do you want to learn more about any of these data/airtime management features? | Yes ☐no ☐ | | |

### 6. Attitude
6.1. How do you feel about cell phones: (Select only one answer)

| | Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|---|
| 6.1.1. I like cell phones | ☐ | ☐ | ☐ | ☐ |
| 6.1.2. I like to use a cell phone | ☐ | ☐ | ☐ | ☐ |
| 6.1.3. My cell phone is easy to use | ☐ | ☐ | ☐ | ☐ |
| 6.1.4. My cell phone is very important to me | ☐ | ☐ | ☐ | ☐ |

6.2. What do you think about cell phones: (Select only one answer.)

| | Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|---|
| 6.2.1. A cell phone makes things easier | ☐ | ☐ | ☐ | ☐ |
| 6.2.2. A cell phone is a useful instrument for communicating with people | ☐ | ☐ | ☐ | ☐ |
| 6.2.3. A cell phone is helpful in reminding me of important things, e.g. appointments | ☐ | ☐ | ☐ | ☐ |
| 6.2.4. I prefer less complex cell phones | ☐ | ☐ | ☐ | ☐ |
| 6.2.5. I prefer pushbuttons, not touchscreens | ☐ | ☐ | ☐ | ☐ |

6.3. Why do you use cell phones: (Select only one answer)

|                                              | Strongly disagree | Disagree | Agree | Strongly agree |
|----------------------------------------------|-------------------|----------|-------|----------------|
| 6.3.1. A cell phone makes me more independent | ☐                 | ☐        | ☐     | ☐              |
| 6.3.2. A cell phone makes me feel competent   | ☐                 | ☐        | ☐     | ☐              |
| 6.3.3. I learn new things on cell phones      | ☐                 | ☐        | ☐     | ☐              |

## 7. Interpersonal contact using cell phones
7.1. What do you do when you receive a call? (Select only one answer)

| | |
|---|---|
| 7.1.1. I answer it myself (Skip to 7.3.) | ☐ |
| 7.1.2. I ask my spouse to answer | ☐ |
| 7.1.3. I ask a younger family member to answer | ☐ |
| 7.1.4. I ask a family member of my age to answer | ☐ |
| 7.1.5. I ask an older family member to answer | ☐ |
| 7.1.6. I ask a younger community member to answer | ☐ |
| 7.1.7. I ask a community member of my age to answer | ☐ |
| 7.1.8. I ask an older community member to answer | ☐ |

7.2. Why would you choose that (those) specific person(s)?
(Choose one or two options only)

| | |
|---|---|
| 7.2.1. I trust them | ☐ |
| 7.2.2. They live close to me | ☐ |
| 7.2.3. They are younger than me | ☐ |
| 7.2.4. They are the same age as me | ☐ |
| 7.2.5. They are older than me | ☐ |
| 7.2.6. They are educated and have knowledge and resources | ☐ |
| 7.2.7. They are family | ☐ |
| 7.2.8. They won't judge me | ☐ |
| 7.2.9. Other (please specify) | ☐ |

7.3. What do you do when you receive a text? (Select only one answer)

| | |
|---|---|
| 7.3.1. I answer it myself (Skip to 7.5) | ☐ |
| 7.3.2. I ask my spouse to answer on my behalf | ☐ |
| 7.3.3. I ask a younger family member to answer on my behalf | ☐ |
| 7.3.4. I ask a family member of my age to answer on my behalf | ☐ |
| 7.3.5. I ask an older family member to answer on my behalf | ☐ |
| 7.3.6. I ask a younger community member to answer on my behalf | ☐ |
| 7.3.7. I ask a community member of my age to answer on my behalf | ☐ |
| 7.3.8. I ask an older community member to answer on my behalf | ☐ |

7.4. Why would you choose that (those) specific person(s)?
(Choose one or two options only)

| | |
|---|---|
| 7.4.1. I trust them | ☐ |
| 7.4.2. They live close to me | ☐ |
| 7.4.3. They are younger than me | ☐ |
| 7.4.4. They are the same age as me | ☐ |
| 7.4.5. They are older than me | ☐ |
| 7.4.6. They are educated and have knowledge and resources | ☐ |
| 7.4.7. They are family | ☐ |
| 7.4.8. They won't judge me | ☐ |
| 7.4.9. Other (please specify) | ☐ |

7.5. Whom do you phone if you need urgent help?
(Choose one or two options only)

| | |
|---|---|
| 7.5.1. No one (Skip to 7.7.) | ☐ |
| 7.5.2. Spouse | ☐ |
| 7.5.3. Children | ☐ |
| 7.5.4. Grandchildren | ☐ |
| 7.5.5. Friend and/or community member(s) | ☐ |
| 7.5.6. Emergency services | ☐ |
| 7.5.7. Other family members (please specify) | ☐ |

7.6. Why would you choose that (those) specific person(s)?
(Choose one or two options only)

| | |
|---|---|
| 7.6.1. I trust them | ☐ |
| 7.6.2. They live close to me | ☐ |
| 7.6.3. They are younger than me | ☐ |
| 7.6.4. They are the same age as me | ☐ |
| 7.6.5. They are older than me | ☐ |
| 7.6.6. They are educated and have knowledge and resources | ☐ |
| 7.6.7. They are family | ☐ |
| 7.6.8. They won't judge me | ☐ |
| 7.6.9. Other (please specify) | ☐ |

7.7. Whom do you contact just to talk to? (Choose one or two options only)

| | |
|---|---|
| 7.7.1. No one | ☐ |
| 7.7.2. Spouse | ☐ |
| 7.7.3. Children | ☐ |
| 7.7.4. Grandchildren | ☐ |
| 7.7.5. Friend(s) younger than me | ☐ |
| 7.7.6. Friend(s) of my age | ☐ |

| 7.7.7. Friend(s) older than me | ☐ |
| 7.7.8. Younger family member(s) | ☐ |
| 7.7.9. Family member(s) of my age | ☐ |
| 7.7.10.Older family member(s) | ☐ |
| 7.7.11. Neighbours | ☐ |
| 7.7.12. Younger community member(s) | ☐ |
| 7.7.13. Community member(s) of my age | ☐ |
| 7.7.14. Older community member(s) | ☐ |
| 7.7.15. Other (please specify) | ☐ |

### 7.8. Whom do you mainly ask for help with a cell phone?
(Select only one answer)

| 7.8.1. No one (Skip to 7.14) | ☐ |
| 7.8.2. Spouse | ☐ |
| 7.8.3. Children | ☐ |
| 7.8.4. Grandchildren | ☐ |
| 7.8.5. Friend(s) younger than me | ☐ |
| 7.8.6. Friend(s) of my age | ☐ |
| 7.8.7. Friend(s) older than me | ☐ |
| 7.8.8. Younger family member(s) | ☐ |
| 7.8.9. Family member(s) of my age | ☐ |
| 7.8.10. Older family member(s) | ☐ |
| 7.8.11. Neighbours | ☐ |
| 7.8.12.Younger community member(s) | ☐ |
| 7.8.13.Community member(s) of my age | ☐ |
| 7.8.14.Older community member(s) | ☐ |
| 7.8.15.Other (please specify) | ☐ |

### 7.9. Why do you ask that (those) specific person(s)?
(Choose one or two options only)

| 7.9.1. I trust them | ☐ |
| 7.9.2. They live close to me | ☐ |
| 7.9.3. They are younger than me | ☐ |
| 7.9.4. They are the same age as me | ☐ |
| 7.9.5. They are older than me | ☐ |
| 7.9.6. They are educated and have knowledge and resources | ☐ |
| 7.9.7. They are family | ☐ |
| 7.9.8. They won't judge me | ☐ |
| 7.9.9. Other (please specify) | ☐ |

7.10. How old are the people you mainly ask for help to use a cell phone? (Select only one answer)

| | |
|---|---|
| 7.10.1. Younger than me | ☐ |
| 7.10.2. Same age as me | ☐ |
| 7.10.3. Older than me | ☐ |

7.11. What is the general attitude of people when you ask them to help you with a cell phone? (Choose at least one answer per age group)

| | Friendly | Helpful | Neutral | Unhelpful | Unfriendly | Irritated | Angry |
|---|---|---|---|---|---|---|---|
| 7.11.1. Younger person(s) | | | | | | | |
| 7.11.2. Person (s) of my age | | | | | | | |
| 7.11.3. Older person(s) | | | | | | | |

7.12. What do people generally do when you ask them for help with a cell phone? (Choose at least one answer per age group)

| | They help with a positive attitude | They always help | They some-times help | They help but with a negative attitude | They never help | They ignore me |
|---|---|---|---|---|---|---|
| 7.12.1. Younger person(s) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7.12.2. Person(s) of my age | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7.12.3. Older person (s) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

7.13. Do people expect anything in return for their help? (Choose at least one answer per age group)

| | Nothing | Yes, money | Yes, airtime | Yes, co-use of the cell phone | Other |
|---|---|---|---|---|---|
| 7.13.1. Younger person (s) | | | | | |
| 7.13.2. Person(s) of my age | | | | | |
| 7.13.3. Older person(s) | | | | | |

7.14. How often do you contact the following people on a cell phone?
(Select one answer for every option listed)

|  | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 7.14.1. Spouse | ☐ | ☐ | ☐ | ☐ |
| 7.14.2. Children | ☐ | ☐ | ☐ | ☐ |
| 7.14.3. Grandchildren | ☐ | ☐ | ☐ | ☐ |
| 7.14.4. Younger family members | ☐ | ☐ | ☐ | ☐ |
| 7.14.5. Family members of your age | ☐ | ☐ | ☐ | ☐ |
| 7.14.6. Older family members | ☐ | ☐ | ☐ | ☐ |
| 7.14.7. Younger friends | ☐ | ☐ | ☐ | ☐ |
| 7.14.8. Friends of your age | ☐ | ☐ | ☐ | ☐ |
| 7.14.9. Older friends | ☐ | ☐ | ☐ | ☐ |
| 7.14.10. People from church | ☐ | ☐ | ☐ | ☐ |
| 7.14.11. Any other person | ☐ | ☐ | ☐ | ☐ |

7.15. Why do you contact these people? (Choose one or two options only)

| | |
|---|---|
| 7.15.1. To hear how they are | ☐ |
| 7.15.2. I am lonely, I miss them | ☐ |
| 7.15.3. I like talking to them | ☐ |
| 7.15.4. To provide/receive important news | ☐ |
| 7.15.5. To ask for advice, e.g. personal problem | ☐ |
| 7.15.6. To ask for help, e.g. leaking tap | ☐ |
| 7.15.7. To send them money | ☐ |
| 7.15.8. To ask for money | ☐ |
| 7.15.9. To fight with them | ☐ |
| 7.15.10. Other (please specify) | ☐ |

7.16. How often are you contacted on a cell phone by the following people?
(Select one answer for every option listed)

|  | Never | Once a month | A few times a month | Every day of the month |
|---|---|---|---|---|
| 7.16.1. Spouse | ☐ | ☐ | ☐ | ☐ |
| 7.16.2. Children | ☐ | ☐ | ☐ | ☐ |
| 7.16.3. Grandchildren | ☐ | ☐ | ☐ | ☐ |
| 7.16.4. Younger family members | ☐ | ☐ | ☐ | ☐ |
| 7.16.5. Family members of your age | ☐ | ☐ | ☐ | ☐ |
| 7.16.6. Older family members | ☐ | ☐ | ☐ | ☐ |
| 7.16.7. Younger friends | ☐ | ☐ | ☐ | ☐ |

| 7.16.8. Friends of your age | ☐ | ☐ | ☐ | ☐ |
|---|---|---|---|---|
| 7.16.9. Older friends | ☐ | ☐ | ☐ | ☐ |
| 7.16.10. People from church | ☐ | ☐ | ☐ | ☐ |
| 7.16.11. Any other person | ☐ | ☐ | ☐ | ☐ |

7.17. Why are you contacted by these people? (Choose one or two options only)

| 7.17.1. To hear how I am | ☐ |
|---|---|
| 7.17.2. They are lonely, they miss me | ☐ |
| 7.17.3. They like talking to me | ☐ |
| 7.17.4. To provide/receive important news | ☐ |
| 7.17.5. To ask for advice, e.g. personal problem | ☐ |
| 7.17.6. To ask for help, e.g. leaking tap | ☐ |
| 7.17.7. To send me money | ☐ |
| 7.17.8. To ask for money | ☐ |
| 7.17.9. To fight with me | ☐ |
| 7.17.10. Other (please specify) | ☐ |

**8. How did you experience the data-collection process?**

_____.

This is the end of the questionnaire. Thank you for your time and participation!

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# Chapter 6
# Older South Africans' Cell Phone Use in Diverse Settings: A Baseline Assessment

Vera Roos, Jaco Hoffman, Mianda Erasmus, Elizabeth Bothma, and Leoni van der Vaart

**Abstract** Interventions through Information and Communication Technology (ICT) (*e*Interventions), particularly cell phones, are increasingly regarded as feasible alternatives to address older individuals' access to social and health care and services. Limited documented evidence of older South Africans' cell phone use inhibits the full relevant operationalizing of *e*Interventions. This chapter sets out to present baseline evidence of a cohort of older persons' cell phone use in South Africa. Two questionnaires, iGNiTe and we-DELIVER, were developed to obtain baseline data of older persons' cell phone use over a period of six years. Reliability and validity of scales measuring latent factors were investigated using criterion sampling to select older South Africans ($n = 430$) from four communities (Lokaleng, Ikageng, Potchefstroom, and Sharpeville) in two provinces—North West and Gauteng—which represented varying levels of living standards, educational attainment, and household size. Data were analysed using IBM SPSS 26, the jamovi project, and Mplus 8.6. The study population reported high access to and ownership of cell phones, with connectivity obtained primarily on a pay-as-you-go basis. Although these individuals felt that they were competent to use their phones, they preferred older generation (pushbutton) devices. They mainly used the basic features to maintain contact with older and younger people. Moreover, their competence in using cell phones, although limited, was facilitated through the assistance of younger people, highlighting the importance of intergenerational relations. The baseline

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findings informed principles and suggestions for planning and implementing *e*Interventions.

**Keywords** Cell phone use · Information and communication technology (ICT) interventions · Older south Africans · Situatedness · Social dynamics

## 6.1 Contextualization

The deep infiltration of information and communication technology (ICT) into the developing world across all generations (including the rapidly increasing cohorts of even the oldest members of society) is a growing reality (see Chap. 1). Generally, this underscores a major demographic and technological shift within developing countries in which most older users of technology have leapfrogged previous developments. It is undisputed that the situation and well-being of older persons and their participation in society depend increasingly on ICT. Present understanding of the needs and abilities of older users of this technology in developing countries is, however, limited to a few qualitative studies. Although most older persons have access to cell phones (see Chap. 1), it is not clear how they use them. Because of the many potential benefits ICT offers, including reduced care costs, improved therapeutic outcomes, and increased access to services (Agha, 2014; Lindberg et al., 2013; McInnes et al., 2013; Zonneveld et al., 2020), it is important in terms of future interventions for researchers, policymakers and practitioners alike to have an evidence-based understanding of older persons' use of cell phones. This chapter reports on older users' baseline cell phone use, the type of device they have access to and how they use it, as well as the nature of the social networks generated around them and the relational dynamics mediated by the use of the cell phone.

Four communities of older persons in South Africa (ranging from a poorly resourced, tribal rural village to better resourced and urbanized settings) serve as the study populations for this baseline assessment. The country includes a diverse range of older cell phone users, and the results presented in this chapter should be understood against the background of some general trends that impact the majority of older South Africans: poverty and inequalities, migration, and the quadruple burden of disease (Hoffman & Roos, 2021); a fragmented care sector; and the changing dynamics of generational family care within and across complex linked multigenerational households (Moore, 2020; Schatz et al., 2015) (see Chap. 1).

The study reported here considers the following conceptual and methodological parameters for analytical and interpretative perspectives:

– Most older Black South Africans have no choice but to age in places where they have lived for much or all of their lives, whether appropriate or not. This lack of choice is predominantly the result of past policies instituted by Apartheid, the centrality of 'the family should care' discourse, and issues of accessibility and affordability of institutional or more formalized housing and care (Aboderin & Hoffman, 2015). This means that they often live with families in areas where

there are few nursing homes or other facilities to accommodate older persons as they become frail, particularly in rural parts. Technology to assist in soliciting and accessing care through cell phones is thus essential.

– Within these linear and complex linked multigenerational households, older persons constitute a source of income (often the only reliable source) as recipients of a means-tested, non-contributory, state-funded pension available at age 60 (see Chap. 1). At a time of high youth unemployment, this gives older generations a particular status but also renders them vulnerable, especially in the case of older women on whom many monetary demands (including paying for airtime) are made (Moore, 2020).

– For categorization purposes, the South African Advertising Research Foundation (SAARF) Living Standards Measure (SU-LSM™) is used; this has become the most widely used segmentation tool in South Africa (Haupt, 2017). It cuts across variables such as race, gender, and age to categorize people by grouping them according to their living standards. For the purposes of this baseline assessment, age (starting at 50 years) was considered. Haupt (2017) draws attention to the fact that, during the early development and operationalization of SU-LSM™, the descriptors correlated highly with race, with the majority of Black people falling into lower LSM descriptors (1 to 6), and the higher measures (7–10) being more multiracial. As the South African society resets itself post-1994, it is already evident that the impact of race as a differentiating variable has declined, as well as its correlation with LSMs.

– The use of technology by older persons is complex in terms of the continuous differential use by subsequent generations and cohorts. This reflects an apparent digital divide between and within generations (Pirhonen et al., 2020). The digital divide broadly refers to a disparity between groups, related to access to or use of ICT (Chang et al., 2004). As new technologies are rapidly developed, older persons may not be able to adapt to new features or capabilities. Instead, they may continue using technology developed when they were younger, even if it has been replaced by improved versions. The digital divide is a fluid issue, changing with and within each generation (see Charness & Boot, 2009). As generations and cohorts age, they will inevitably be superseded by the cohorts following, representing a different culture, and who will in their turn be using increasingly advanced technology with various levels of comfort, acceptance, and skill.

– The analysis in this chapter adopts a 'material' approach to ICT use (see Appadurai, 1986; Ginsburg et al., 2002). It describes the roles the cell phone plays in practice as well as its significance. While the analysis will touch on motives and needs, it focuses more on the social relationships in which the use of cell phones is (ideally or practically) embedded.

This chapter focuses on obtaining information about older persons' cell phone use that can be drawn upon in the subsequent development of *e*Interventions. The drive to determine older South Africans' cell phone use was informed by challenges associated with limited resources, older consumers' needs, and the digital revolution to deliver services. Clearly, without evidence of older adults' cell phone use,

*e*Interventions could be misaligned with the way in which particular cohorts of older persons, across a range of socio-economic contexts, negotiate the digital (cell phone) world. To obtain baseline cell phone use data, a pragmatic view was adopted. It focuses on practice, is interested in facts, while considering context for generalization or transferability to other situations (Gonzalez, 2020; Kankam, 2019; Talisse & Aikin, 2008). A pragmatic approach is particularly relevant in order to identify cell phone literacy and use by older persons because it informs intelligent practice in relation to the "what" and "how" of *e*Interventions (Kankam, 2019).

## 6.2   Research Method

This study applied a cross-sectional survey research design (Satten & Grummer-Strawn, 2014) (see sect. 6.7 for a discussion of the limitations). Data from a selected group of older South Africans' cell phone use were collected in two projects (iGNiTe and we-DELIVER), involving different participants. In addition, the first iGNiTe questionnaire was drawn upon to develop the we-DELIVER questionnaire (see Chap. 5). Accordingly, the datasets have been treated as two separate sets of cross-sectional data, but combined when possible and necessary. The reason for including both sets of data was not necessarily to compare the data sets but to get a more comprehensive, representative picture of older persons' cell phone use in South Africa. However, there were very few instances in which the research settings in the data sets were compared.

### 6.2.1   Participants

Purposive sampling was used to identify research settings (Lokaleng, Ikageng, Potchefstroom, and Sharpeville) in two provinces in South Africa, North West and Gauteng (see Chap. 3). Criterion sampling was used to select the research population consisting of older Black individuals (aged 50+ years) (see footnote 2 in Preface, on page vi) in Lokaleng, Ikageng and Sharpeville, and older White individuals in Potchefstroom (Lavrakas, 2008). These communities represented varying levels of living standard, educational attainment, household size, and competence regarding the use of cell phone technology. The sample consisted of 430 participants[1] (iGNiTe: Ikageng $n = 28$, Potchefstroom $n = 83$,[2] Surrounding areas (e.g. Promosa) $n = 17$; we-DELIVER: Lokaleng $n = 103$, Ikageng $n = 94$; Sharpeville $n = 86$; Surrounding areas (e.g. Tshepiso) $n = 15$). The participants' demographic information is reported in Table 6.1.

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[1] Four participants did not indicate where they live.

[2] Due to past Apartheid policies of spatial separation, this population is mainly White, as classified by Statistics SA.

**Table 6.1** Characteristics of the participants ($n = 430$: iGNiTe $n = 128$; we-DELIVER $n = 302$; n/a = not available)

| Item | Category | iGNiTe | | we-DELIVER | | Combined | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage |
| Gender | Male | 26 | 20.3 | 73 | 24.2 | 99 | 23.0 |
| | Female | 102 | 79.7 | 229 | 75.8 | 331 | 77.0 |
| Education | No education | 6 | 4.7 | 84 | 28.0 | 90 | 20.9 |
| | Primary school | 28 | 21.9 | 132 | 44.0 | 160 | 37.2 |
| | High school/Matric certificate | 61 | 47.6 | 74 | 24.7 | 135 | 31.4 |
| | Degree/Diploma | 27 | 21.1 | 4 | 1.3 | 31 | 7.2 |
| | Postgraduate | 6 | 4.7 | 6 | 2.0 | 12 | 2.8 |
| Location | Lokaleng | 0 | 0.0 | 103 | 34.6 | 103 | 24.0 |
| | Ikageng | 28 | 21.9 | 94 | 31.5 | 122 | 28.4 |
| | Sharpeville | 0 | 0.0 | 86 | 28.9 | 86 | 20.0 |
| | Potchefstroom | 83 | 64.8 | 0 | 0.0 | 83 | 19.3 |
| | Other | 17 | 13.3 | 15 | 5.0 | 32 | 7.4 |
| Household size | Living alone | 26 | 20.3 | 73 | 27.2 | 99 | 23.0 |
| | 2–5 persons | n/a | n/a | 85 | 31.7 | n/a | n/a |
| | 6–19 persons | n/a | n/a | 110 | 41.1 | n/a | n/a |
| Living with | No one else | 26 | 22.6 | 73 | 24.5 | 99 | 24.0 |
| | Spouse | 45 | 39.1 | 139 | 46.6 | 184 | 44.6 |
| | Children | 35 | 30.4 | 162 | 54.9 | 197 | 48.0 |
| | Grandchildren | 35 | 30.4 | 167 | 57.2 | 202 | 49.6 |
| | Siblings | 2 | 1.7 | 27 | 9.1 | 29 | 7.0 |
| | Parents | 0 | 0.0 | 2 | 0.7 | 2 | 0.5 |
| | Grandparents | 0 | 0.0 | 3 | 1.0 | 3 | 0.7 |
| | Friends | 8 | 7.0 | 4 | 1.4 | 12 | 2.9 |
| | Other people | 0 | 0.0 | 31 | 10.5 | 31 | 10.5 |

(continued)

**Table 6.1** (continued)

| Item | Category | iGNiTe | | we-DELIVER | | Combined | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage |
| Living standards | Low | 1 | 0.8 | 50 | 16.9 | 51 | 11.9 |
| | Medium | 51 | 39.8 | 224 | 75.7 | 275 | 64.0 |
| | High | 76 | 59.4 | 22 | 7.4 | 98 | 22.8 |

*Note.* "Living with" percentage given for each category separately

Participants were aged 50+ years, with grandchildren. Most were female (combined: 77%; iGNiTe: 79.7%; we-DELIVER: 75.8%). Overall, 68.6% of the participants had completed at least some level of basic education. Participants from the iGNiTe project reported higher levels of education (secondary: 47.6%; degree/diploma: 21.1%) compared with their we-DELIVER counterparts (no education: 28%; primary school: 44%). This is likely to be the result of previous pre-1994 inequalities; for example, the creation of separate schools and discriminatory regulations with lower requirements for non-White people in South Africa, preventing the majority of older Black people from obtaining a quality education (McKeever, 2017) and impacting on their current social status and mobility. In the iGNiTE study, more White older individuals responded to the invitation to participate in the research. The we-DELIVER project intentionally aimed at including Black participants. Although 20.3% (iGNiTe) and 27.2% (we-DELIVER) of the group lived by themselves, most of the households in the we-DELIVER project were multigenerational and consisted of 2–19 people (72.8%). The participants' households were made up largely of a combination of their spouses, children, and/or grandchildren. Very few households included friends or other people.

Living standards were measured using the Living Standard Measure (SU-LSM™) with a scale which varied from 1 to 10 (Haupt, 2017). For reporting purposes, the 10 levels were divided into low, medium, and high standards of living. Lower living standards meant minimal access to services; communal water (some on plots, but not inside the home); and minimal ownership of appliances, except radios and stoves. Medium living standards were defined as having access to most necessary utilities (e.g. electricity; water and flush toilet outside or inside the home) and some useful appliances (e.g. television, stove, refrigerator), while high living standards constituted full access to services and high ownership of durables (e.g. a motor vehicle or a computer). The largest group of people from the iGNiTe study (59.4%) reported high living standards, with the largest group from the we-DELIVER project reporting average living standards (75.7%).

Due to the categorical nature of variables, associations between them were calculated using cross-tabulations (also known as contingency tables). Cross-tabulations are the equivalent of correlations that are used to determine the relationships between continuous variables. Cramer's V (the equivalent of the rho coefficient used in continuous correlations) was computed to provide a measure of the strength of the association between the categorical variables (Field, 2018). The following guidelines were used to determine the magnitude of the association: strong ($>.50$), moderate ($.30$ to $.49$), weak ($.10$ to $.29$) (Cohen, 1988). The relation between area and LSM [$\chi^2$ ($df = 16, n = 420$) = 404, $p < .001$] and education and LSM [$\chi^2$ ($df = 20, n = 424$) = 273, $p < .001$] were both statistically significant. Cramer's V of .49 and .40 indicated a moderate associations between LSM and these demographic characteristics. The results of the cross-tabulation indicated that the LSM for Lokaleng was the lowest, followed by Ikageng and Sharpeville (which reported the same levels of LSM), with Potchefstroom reporting the highest levels. Regarding education, the results showed that LSM levels were positively associated with

education in that increased LSM levels also indicated increased education levels and vice versa.

### 6.2.2 Data-Collection Tools

The iGNiTe questionnaire was developed as part of the mixed-method Inter-Generational Networks through Information Technology study, with the aim of establishing baseline information about older South Africans' cell phone use, as well as the mitigating role played by intergenerational relationships. The iGNiTe questionnaire was based on an extensive literature review of cell phone user patterns of older people throughout the world. Relevant literature and the opinions of experts in sociogerontology informed its development. The first section contained demographic questions, followed by questions regarding the functions of the participants' cell phones, user patterns, attitudes towards the cell phones, and how they use the cell phones in relation to others (see Chap. 5).

In preparation for the we-DELIVER project, the iGNiTe questionnaire was adapted, based on statistical analyses of the data, and further developed using the qualitative findings from the iGNiTe study (Lamont et al., 2017; Leburu et al., 2018; Scholtz, 2015; Steyn et al., 2018). This adapted version was subsequently used for the we-DELIVER questionnaire (see Chap. 5). Certain items were included in the we-DELIVER questionnaire in an attempt to answer the specific research questions in the research project in more depth. The we-DELIVER questionnaire was translated from English into Setswana, Sesotho, and isiZulu by a back-translation process. The first section contained questions about biographical information. The following section asked for information about the cell phone used by participants, and how they accessed the device. Items in the third section measured feature use as well as participants' levels of knowledge, skills, and attitude regarding cell phones. The final section dealt with intergenerational patterns around cell phone use (referred to as social networks and communication in this chapter) (see Chap. 5).

### 6.2.3 Data Analysis

SPSS 26 (IBM Corporation, 2020), jamovi 1.2 (R Core Team, 2019; the jamovi project, 2020), and Mplus 8.6 (Muthén & Muthén, 1998–2021) were used to analyse the data. Descriptive statistics and frequencies were calculated. There was a notable amount of missing information on many questions, therefore, the different items' frequencies might not add up to the total of 430 participants, whereas percentages should add up to 100%, as missing values were not considered in the calculation of totals. Associations between categorical variables were analysed using cross-tabulations, and Pearson's chi-square ($\chi^2$) test. The validity (using confirmatory factor analysis) and reliability (using McDonald's omega coefficient) of the

knowledge, skills, and attitude scales were evaluated with a suggested cut-off value of .70 (Nunnally & Bernstein, 1994) for the reliability coefficients. These three factors are latent variables and hence the dimensionality (i.e. validity) and reliability needed to be evaluated. Finally, differences in means (for knowledge, skills and attitudes) were investigated using a non-parametric technique (the Independent-samples Kruskal–Wallis test). The statistical analyses were reviewed independently to ensure that procedures followed were applicable and applied correctly.

## 6.3 Results

The results are presented in four main sections: first, by situating cell phones in relation to older people, followed by how they use cell phones, the social networks around the cell phones, and finally their skills, knowledge and attitudes towards cell phones.

### 6.3.1 Cell Phones in the Context of Older Participants

Table 6.2 illustrates cell phone access, ownership, payment, preference, and choice as assessed in the section "About the cell phone" in the we-DELIVER questionnaire and the relevant items in the iGNiTe questionnaire.

**Access** The majority (iGNiTe 98.4%, we-DELIVER 90.6%) of households had one or more working cell phones. Only 1.6% (iGNiTe) and 9.4% (we-DELIVER) had no cell phones. The relation between the number of phones owned and LSM [$\chi^2$ ($df = 12$, $n = 424$) $= 48.7$, $p < .001$] was statistically significant but weak (Cramer's V $= .20$). The number of cell phones increased as the LSM level of the household increased.

**Ownership** Participants in the iGNiTe (91.7%) project indicated that they were the owners of their phones, whereas most of the participants in the we-DELIVER (70.4%) sample indicated that they borrowed and/or shared the phone with someone else in the household. In this case, most of them shared their phone with children and/or grandchildren rather than with other people. Even if they shared and/or borrowed the phone, 82.5% of the participants reported that they could decide what happened with the phone. The relation between ownership and LSM [$\chi^2$ ($df = 16$, $n = 262$) $= 74.20$, $p < .001$] was statistically significant (weak effect, Cramer's V $= .27$). Older persons who owned their own cell phone tended to fall into the moderate to high LSM categories.

**Preferences and Choice** (applicable only to the we-DELIVER project). Approximately half of the participants indicated that they had chosen their cell phones and wanted them to communicate with others. Only 10.1% wanted a cell phone so that they could receive and provide help. There were a few participants who did not want their cell phones (12.3%) for various reasons. Around three quarters of the participants agreed that they preferred cell phones with pushbuttons, not touchscreens (78.4%), as well as older phones, because they found the new phones too complex (77.2%).

**Table 6.2** Mapping of participants' cell phone information ($n = 430$: iGNiTe $n = 128$; we-DELIVER $n = 302$)

| Item | Category | iGNiTe | | we-DELIVER | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage |
| How many working cell phones are there in your household? | None | 2 | 1.6 | 28 | 9.4 |
| | 1 | 52 | 40.6 | 94 | 31.7 |
| | 2–3 | 56 | 43.8 | 120 | 40.4 |
| | 4+ | 18 | 14.0 | 55 | 18.5 |
| Is the cell phone | Your own | 111 | 91.7 | 39 | 27.5 |
| | Borrowed | 10 | 8.3 | 20 | 14.1 |
| | Shared | 0 | 0.0 | 48 | 33.8 |
| | Borrowed and shared | n/a | n/a | 32 | 22.5 |
| | Your own and shared | n/a | n/a | 3 | 2.1 |
| Who is cell phone borrowed from? | Not borrowed | 114 | 94.2 | 90 | 63.4 |
| | Children and/or grandchildren | 7 | 5.8 | 42 | 29.6 |
| | Other | 0 | 0.0 | 10 | 7.0 |
| Who is cell phone shared with? | Not shared | n/a | n/a | 59 | 41.3 |
| | Children and/or grandchildren | n/a | n/a | 68 | 47.5 |
| | Other | n/a | n/a | 16 | 11.2 |
| Who decides what happens on the phone? | Myself | n/a | n/a | 127 | 82.5 |
| | Other people | n/a | n/a | 27 | 17.5 |
| Who chose the cell phone? | Myself | n/a | n/a | 109 | 49.1 |
| | Children | n/a | n/a | 63 | 28.4 |
| | Grandchildren | n/a | n/a | 17 | 7.6 |
| | Family member | n/a | n/a | 17 | 7.6 |
| | Other person | n/a | n/a | 16 | 7.3 |
| Did you want this cell phone and why/not? | Don't have a phone/Not sharing or borrowing | n/a | n/a | 4 | 2.2 |
| | Yes, for communication | n/a | n/a | 94 | 52.8 |
| | Yes, to receive and provide help | n/a | n/a | 18 | 10.1 |
| | Yes, it's easy to use/affordable/ strong/good quality | n/a | n/a | 19 | 10.7 |
| | Yes, other reason (s) | n/a | n/a | 15 | 8.4 |

**Table 6.2** (continued)

| | | iGNiTe | | we-DELIVER | |
|---|---|---|---|---|---|
| Item | Category | Frequency | Percentage | Frequency | Percentage |
| | No, different reason(s) | n/a | n/a | 22 | 12.3 |
| | Unsure, other reason(s) | n/a | n/a | 6 | 3.5 |
| How are the network services paid for and by whom? | Contract: Myself | 29 | 24.6 | 6 | 2.9 |
| | Contract: Children and/or grandchildren | 12 | 10.2 | 1 | 0.5 |
| | Contract: Family member(s) | 7 | 5.9 | 0 | 0.0 |
| | Contract: Other person(s) | 2 | 1.6 | 0 | 0.0 |
| | Pay-as-you-go: Myself | 42 | 35.6 | 102 | 50.0 |
| | Pay-as-you-go: Children and/or grandchildren | 7 | 5.9 | 31 | 15.2 |
| | Pay-as-you-go: Family member(s) | 2 | 1.7 | 1 | 0.5 |
| | Pay-as-you-go: Other person(s) | 2 | 1.7 | 3 | 1.5 |
| | Pay-as-you-go: Myself and other person(s) | n/a | n/a | 12 | 5.9 |
| | Top-up: Myself | 11 | 9.3 | 33 | 16.2 |
| | Top-up: Children and/or grandchildren | 4 | 3.4 | 8 | 3.9 |
| | Top-up: Family member(s) | 0 | 0.0 | 1 | 0.5 |
| | Top-up: Other person(s) | 0 | 0.0 | 2 | 1.0 |
| | Top-up: Myself and other person(s) | n/a | n/a | 4 | 2.0 |
| Do you prefer old cell phones to new ones? | Strongly agree | n/a | n/a | 112 | 48.3 |
| | Agree | n/a | n/a | 67 | 28.9 |
| | Disagree | n/a | n/a | 25 | 10.8 |
| | Strongly disagree | n/a | n/a | 28 | 12.0 |

(continued)

**Table 6.2** (continued)

| Item | Category | iGNiTe | | we-DELIVER | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage |
| Do you prefer cell phones with pushbuttons to touchscreens? | Strongly agree | n/a | n/a | 101 | 43.5 |
| | Agree | n/a | n/a | 81 | 34.9 |
| | Disagree | n/a | n/a | 23 | 9.9 |
| | Strongly disagree | n/a | n/a | 27 | 11.7 |

Note: n/a = not available

**Payment** Older persons pay for network services themselves: iGNiTe 69.5% (35.6% pay-as-you-go, 24.6% contract, and 9.3% top-up) and we-DELIVER 69.1% (50.0% pay-as-you-go, 16.2% top-up, and 2.9% contract)].

### 6.3.2 Utilization

The results of older people's understanding of the use their phones are reported in Table 6.3.

**Feature Use** Cell phones offer a wide variety of features and it is important to map how older people use these. Most participants indicated that they used their phones sometimes (60.6%). The categories specified in the we-DELIVER questionnaire were divided into two for ease of reporting, namely:

– basic features: call, SMS, alarm clock, time, calendar; and
– advanced, including internet-dependent features: WhatsApp, games, photos and selfies, calculator, radio, email, news, Facebook, Google, online banking.

These items were not part of the iGNiTe questionnaire in this format, thus the information was available only for we-DELIVER participants. More than two thirds of the participants indicated that they used the functions categorized under basic features themselves (69.3%), and on average a few times a day (55.8%), while on average 24.9% indicated use once a day, and another average, 12.9%, once a week.

Looking at each basic feature, the following major trends emerged: (we-DELIVER $n = 302$).

– By far the majority (95.5%) of older persons make and receive calls themselves and more than 70% do so once and more often a day. Only around 3% asked for help occasionally.
– Most of the participants (64.5%) are able to send and receive SMSs. Around 10% asking for help a few times a day. The rest of the participants do not use this cell phone feature.

**Table 6.3**  Cell phone feature use (iGNiTe $n = 0$; we-DELIVER $n = 302$)

| | | | we-DELIVER | |
|---|---|---|---|---|
| Type | Item | Category | Frequency | Percentage |
| Do you use cell phone to/for. . . | Call | Never | 4 | 1.8 |
| | | Myself | 214 | 95.5 |
| | | Ask someone else | 6 | 2.7 |
| | SMS | Never | 51 | 25.9 |
| | | Myself | 127 | 64.5 |
| | | Ask someone else | 19 | 9.6 |
| | Alarm | Never | 88 | 47.8 |
| | | Myself | 85 | 46.2 |
| | | Ask someone else | 11 | 6.0 |
| | Time | Never | 28 | 15.7 |
| | | Myself | 146 | 82.0 |
| | | Ask someone else | 4 | 2.3 |
| | Date and calendar | Never | 62 | 35.8 |
| | | Myself | 101 | 58.4 |
| | | Ask someone else | 10 | 5.8 |
| | Advanced, incl. internet-dependent features | Never | | 87.2 |
| | | Myself | | 9.9 |
| | | Ask someone else | | 3.0 |
| How often is a cell phone used for. . . | Basic features | Never/once a month | | 66.4 |
| | | Once a week | | 13.9 |
| | | Once a day | | 15.3 |
| | | A few times a day | | 4.4 |
| | Advanced, incl. internet-dependent features | Never/once a month | | 98.0 |
| | | Once a week | | 0.9 |
| | | Once a day | | 1.2 |
| | | A few times a day | | 0.0 |

– Almost half of the participants (51.1%) use the alarm clock, with almost 6% needing assistance. It is important to note that nearly 48% had never made use of this basic feature.
– The majority of participants consult their cell phones themselves for the time (82.1%), while 15.7% never used their cell phone to tell the time, and only 2.3% needed help with this feature.
– Around half of the participants (58.4%) use the cell phone calendar themselves, with around 6% needing assistance to do so.

In contrast, the advanced, including internet-dependent features were used rarely, with about 98% of people reporting that they had never, or only once a month, made use of any of these. There were two exceptions, however: some participants reported that another person had helped them with appointment reminders once a week

(26.3%), and 14.9% indicated that they listened to music or the radio on their cell phone several times a day. Table 6.3 presents the information about use of specific cell phone features.

**Obtaining Information about Services** Relevant data were collected under the "Care needs and relational regulation" section of the we-DELIVER questionnaire. Very few (average 5.9%) used their cell phones regularly to find information about services. They sometimes used their cell phones for information about ambulance services (34.7%), police services (32.3%), hospitals (27.1%), clinics (25.4%), and electrical services (21.0%). The majority never used their cell phones to find information about available services (average 72.3%).

### 6.3.3 Social Networks around Cell Phone Use

Cell phones are not used in isolation. These devices are intricately intertwined with the social networks of older persons, both in terms of contact and assistance. Contact is made and maintained with people across distance and assistance is required from people in the immediate proximity. Table 6.4 provides an overview of the older participants' behaviour when they encounter difficulties with using their cell phones and of the reactions of those from whom they ask for assistance.

**Contact** Making and maintaining contact was the main reason for having a cell phone, according to the participants. Whether they needed help or just wanted someone to talk to, participants mostly contacted their children (for help 56.8%, to talk to 60.0%) or family members (for help 14.4%, to talk to 20.9%). Examination of the frequency of contact between older persons and others revealed that most participants only sometimes contacted other people and were contacted by other people (grandchildren, younger/older family members, younger/older friends, or people from church). There were exceptions in the case of their children (a large number contacted their children regularly) and emergency services (most never contacted these). They were regularly contacted by their children but never by the emergency services. Participants indicated they mostly contacted or were contacted by others to find out how they were doing.

**Assistance** When participants struggled to use their cell phones, 67.8% (iGNiTe) and 71.2% (we-DELIVER) would ask for help. When seeking assistance, 68.8% (iGNiTe) and 71.2% (we-DELIVER) of participants would preferably ask their children or grandchildren, because they trusted them and/or they were nearby (we-DELIVER 72.0%; information not available for iGNiTe). The participants reported that the people they had approached for assistance were usually friendly and helpful (89.6%). When they asked younger people to assist them, 75.8% always did so. Although 82.0% of the younger people did not expect anything in return for their help, some asked for airtime (7.3%), money (6.1%), use of the cell phone (1.5%), or something else, such as sweets (e.g. chocolates), tea, or useful items around the house (2.7%).

**Table 6.4** Assistance with cell phone functions ($n = 430$: iGNiTe $n = 128$; we-DELIVER $n = 302$)

| Type | Item | iGNiTe | | we-DELIVER | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage |
| What do you do when experiencing difficulty with a cell phone? | Leave it | 10 | 8.5 | 28 | 10.8 |
| | Try to figure it out | 23 | 19.5 | 13 | 5.0 |
| | Read the manual | 5 | 4.2 | 3 | 1.2 |
| | Ask for help | 80 | 67.8 | 185 | 71.2 |
| | Other, e.g. Google | n/a | n/a | 11 | 4.2 |
| | Combination of above options | n/a | n/a | 20 | 7.7 |
| Whom do you mainly ask for help? | Children and/or grandchildren | 55 | 68.8 | 185 | 71.2 |
| | Family member | 9 | 11.3 | 12 | 4.6 |
| | Other, e.g. friend, community member | 16 | 20.1 | 28 | 10.7 |
| | Combination of above options | n/a | n/a | 35 | 13.4 |
| Why do you ask these person(s)? | Trust them and/or they are close by | n/a | n/a | 187 | 72.0 |
| | They are younger than me | n/a | n/a | 9 | 3.5 |
| | They have knowledge and resources | n/a | n/a | 27 | 10.4 |
| | Combination of above options | n/a | n/a | 37 | 14.3 |
| Attitude of people asked for help | Friendly or helpful | n/a | n/a | 233 | 89.6 |
| | Neutral | n/a | n/a | 16 | 6.2 |
| | Unhelpful/unfriendly/irritated | n/a | n/a | 11 | 4.2 |
| What do younger people do when asked for help? | Always help | n/a | n/a | 197 | 75.8 |
| | Sometimes help | n/a | n/a | 42 | 16.2 |
| | Never help | n/a | n/a | 9 | 3.5 |
| | Help but with negative attitude | n/a | n/a | 8 | 3.1 |
| | Ignore me | n/a | n/a | 4 | 1.5 |
| Do they expect something in return for helping? | No | n/a | n/a | 214 | 82.0 |
| | Yes, airtime | n/a | n/a | 19 | 7.3 |
| | Yes, money | n/a | n/a | 16 | 6.1 |
| | Yes, co-use of the phone | n/a | n/a | 4 | 1.5 |
| | Yes, other things | n/a | n/a | 7 | 2.7 |
| | I don't ask for help | n/a | n/a | 1 | 0.4 |

Note: n/a = not available

Data from care needs and relational regulation and intergenerational patterns in the we-DELIVER questionnaire were combined

### 6.3.4   Knowledge, Skills, and Attitude

Knowledge, skills, and attitude items were not included in this format in the iGNiTe questionnaire, hence only information from the we-DELIVER questionnaire will be discussed. Confirmatory factor analysis (CFA) was conducted to confirm the factor structure (i.e. the validity) of the respective scales due to the latent nature of the factors. The knowledge and skills scales used dichotomous response scales (no/yes) and the attitude scale used an ordinal level response scale [1 (strongly disagree) to 4 (strongly agree)] and therefore the weighted least squares mean- and variance-adjusted (WLSMV) estimator was used. The following goodness of fit indices were used to evaluate model fit (Kline, 2016; West et al., 2012): Satorra-Bentler (SB) chi-square ($\chi^2$) (a smaller value indicates better fit); the Tucker–Lewis index (TLI) and comparative fit index (CFI) $\geq$ .95; root mean square error of approximation (RMSEA) $\leq$ .08; and the standardized root mean square residual (SRMR) < .10. Following the validity assessment, the reliability coefficients of the scales were calculated.

Knowledge was modelled as a latent factor with 11 observed indicators in line with the theoretical proposition of the questionnaire. Warning messages, containing Items 1 ["I know where to switch my cell phone on and off" and 4 ("I know how to use advanced features on my cell phone (e.g. WhatsApp, Facebook, etc.)" were generated. These warnings indicated that the variables were not statistically distinguishable, thus rendering the items unusable for the analysis. Therefore, these two items were deleted. Most of the fit indices of the revised model were satisfactory ($\chi^2 = 62.92$, d$f = 27$, $p < .001$; RMSEA = .07 [.05, .09]; CFI = .99; TLI = 1.00; SRMR = .08). RMSEA values could be artificially high for models with low degrees of freedom (Kenny et al., 2015). However, although the upper bound value of the RMSEA was higher than the cut-off of .08, recent simulation studies have shown that the SRMR performs better than the RMSEA (Shi et al., 2020). The SRMR value in the current study showed a good fit between the model and the data. The factor loadings were all significant and ranged from .74 to .99.

Skills were modelled as a latent factor with six observed indicators in line with the theoretical proposition of the questionnaire. Most of the fit indices of the model were unsatisfactory ($\chi^2 = 183.90$, d$f = 9$, $p < .001$; RMSEA = .27 [.24, .31]; CFI = .75; TLI = .58; SRMR = .15). Upon inspection of the factor loadings, two items were problematic: Item 3 ("I require assistance to explore new features") had a non-significant factor loading, and 4 ("I am not competent enough to use all my cell phone features") had a factor loading of .19. This is far below the recommended value of .50 (Hair et al., 2014). Consequently, these two items were removed. The revised model's fit statistics were acceptable for most of the indices ($\chi^2 = 1.57$, d$f = 2$, $p < .001$; RMSEA = .00 [.00, .11]; CFI = 1.00; TLI = 1.00; SRMR = .02). The factor loadings were all significant and ranged from .69 to .95. Although the upper bound value of the RMSEA was higher than the cut-off of .08, the SRMR value in the current study showed a good fit between the model and the data.

Attitude was modelled as a latent factor with 13 observed indicators in line with the theoretical proposition of the questionnaire. Most of the fit indices of the model were satisfactory ($\chi^2$ = 334.183, d$f$ = 65, $p$ < .001; RMSEA = .13 [.11, .14]; CFI = .93; TLI = .92; SRMR = .07). However, inspection of the factor loadings indicated two problematic items with non-significant factor loadings: Items 4 ("I see my cell phone as a dangerous gadget") and 5 ("I don't like cell phones"). Consequently, these two items were removed, and the revised model's fit statistics were acceptable for most of the indices ($\chi^2$ = 335.53, d$f$ = 44, p < .001; RMSEA = .16 [.14, .17]; CFI = .92; TLI = .90; SRMR = .07). The RMSEA value was again higher than the cut-off of .08. However, the SRMR value in the current study showed a good fit between the model and the data. The factor loadings were all significant and ranged from .46 to .92. The reliability coefficients for each of the respective factors were .86 (for knowledge), .76 (for skills), and .89 (for attitude).

The modes for the items of each of the factors were inspected. Most participants indicated that they had no knowledge of most functions (i.e. send messages, take photos, operate cell phone independently, create a contacts list, use the internet, and upload airtime). The only exceptions were making calls, locking and unlocking the phone, and checking phone balance) with most participants indicating that they knew how to do these. Similarly, most participants indicated that they had no skills to use a cell phone (that is, the ability to do what they intend to without assistance, to explain to others what to do, and to use all the features on their phones). Participants, however, felt that they could check their cell phone balance on their own. Most participants felt positive about their phones because most agreed, or strongly agreed, with the attitude statements.

To gain a deeper understanding of the participants' knowledge, skills and attitudes, group differences (according to area, education, LSM, ownership, and desire to own a cell phone) were investigated. Factor scores were calculated for each factor after the respective CFAs and used in subsequent analyses. Because the data deviated from a normal distribution (Shapiro–Wilk test: $p$ < .001), the non-parametric alternative of the analysis of variance (ANOVA) test, the Independent-samples Kruskal–Wallis test, was used. Results indicated that knowledge [H (3) = 1.50, $p$ = .68] and skills [H (3) = 1.83, $p$ = .61] were equal across areas, but that attitudes differed among some areas [H (3) = 15.26, $p$ = .001]. More specifically, post-hoc tests [Games-Howell because the Welch's test for equal variances was significant ($p$ = .004)] showed that Lokaleng had more positive attitudes towards cell phones than Ikageng and Sharpeville. In contrast, results indicated that knowledge [H (3) = 30.25, $p$ < .001] and skills [H (3) = 16.87, $p$ < .001] differed on the basis of education, but attitudes did not [H (3) = .92, $p$ = .82]. Games-Howell post-hoc comparisons indicated that those with higher levels of education reported greater levels of knowledge and skills regarding cell phone use. More specifically, the possession of a matric (school-leaving) certificate and higher education mattered. Results also indicated that levels of knowledge [H (4) = 7.64, $p$ = .106], skills [H (4) = 2.74, $p$ = .603], as well as attitude [H (4) = 6.46, $p$ = .168], were the same across LSM groups. Levels of knowledge [H (3) = 7.09, $p$ = .069], skills [H (3) = 7.62, $p$ = .054], as well as attitude

[H (3) = 2.50, $p$ = .476], were the same regardless of whether the older person was the owner of the phone or shared and/or borrowed it.

The Kruskal–Wallis test showed that knowledge [H (2) = 12.09, $p$ = .002] differed depending on whether the older person wanted a cell phone. However, Games-Howell post-hoc comparisons indicated no significant differences between the groups. Skills did not differ [H (2) = 5.42, $p$ = .066] significantly when compared in terms of whether the older person wanted a cell phone or not. Attitude [H (2) = 7.09, $p$ = .029] differed depending on whether the older person wanted a cell phone. More specifically, Games-Howell post-hoc comparisons showed that older persons who wanted a phone had more positive attitudes than those who did not want the device.

## 6.4   Discussion of Results

The core baseline data of South Africans and their cell phones present in relation to the:

– situation in households, living standard and educational levels;
– use of the phones;
– cell phone competence (skills and knowledge) and attitudes; and
– social dynamics around the use of the cell phones.

The majority of older participants in multigenerational households have access to at least one cell phone or even more. Cell phone ownership depends on living standards and the level of education. Most of these older individuals have at least some level of basic education and those with a higher education status (secondary and tertiary education) also report higher living standards and own more cell phones. This is in direct contrast with most older individuals with lower education and living standards, also confirmed by Pirhonen et al. (2020) in a developed-country context. A means-tested old age pension sustains the livelihoods of the majority of multigenerational households and is also drawn on to purchase airtime (usually on a pay-as-you-go basis). This financial lifeline gives older individuals negotiating power—even though they might not always own the cell phone, they ultimately decide how it is used—and demonstrates a sense of agency (also see Pype, 2016).

In line with similar international studies in relation to the use of cell phones (Chen et al., 2013; Kurniawan, 2008; Pirhonen et al., 2020), most participants prefer older generation cell phones (pushbutton) because of familiarity and ease of use. This may explain a particular cohort's preference, but rapid technological advancements will always leave many ageing individuals lagging behind. Planning and implementing *e*Interventions with high acceptance thus require a basic understanding of the cell phone features older persons use and for what purpose at a particular time.

To this end, cell phone features were grouped into basic (call, SMS, alarm clock, time, and calendar) and advanced functions (e.g. internet-dependent, WhatsApp, games, photos and selfies, calculator, radio, email, news, Facebook, Google, online

banking). At least two thirds of older South Africans in this sample used basic cell phone features (excluding the alarm function) daily, with limited help from other people. Older persons used cell phones to make and maintain contact with their children, grandchildren, friends, and sometimes members of a religious community. Older persons in this study hardly ever used advanced features such as WhatsApp, games, photos and selfies, calculator, radio, email, news, Facebook, Google and online banking. This could be because their phones do not support these features. However, it is possible that older users found these features too complicated. The cost of data could also have played a role. Cell phones are used in emergencies and to make and receive contact to exchange information. Our participants never seem to call emergency services, which could be as a result of local government officials' unresponsiveness to their needs (see Chap. 2). However, it seems that the participants did not regard the cell phone as a means to obtain general or emergency information; this might relate to ability or cell phone use competence (knowledge, skills and attitude) to use basic phone features.

Participants' knowledge and skills were found to be the same across contexts, even with different living standards and cell phone ownership groups. The only exception was that of cell phone users' more positive attitudes to the instrument in the lowest resourced setting (Lokaleng). A possible explanation could be that in contexts of deprivation (limited, inappropriate service delivery and the lack of infrastructure) (Hoffman & Roos, 2021), older persons may regard any ICT intervention as a means of obtaining access to better services or the information they need to negotiate a difficult environment (see Chap. 7). Future older cohorts will probably be more competent in using a cell phone, but given cohort effects in terms of the digital divide, will still be at a disadvantage. From a rights perspective, it is argued that no older individual should be left behind and that well-designed intra/intergenerational ICT programmes should be available to support these older generations (see Chap. 2; Pirhonen et al., 2020).

This cohort of older individuals complements their limited educational and cell phone use competence by applying relational regulation strategies (Steyn et al., 2018). They obtain help from related younger people (children and grandchildren) whom they trust, in close physical proximity, and because the younger helpers display a positive, willing attitude (see Chap. 7; Roos & Robertson, 2019). Generally, younger individuals help without an explicit expectation of receiving anything in return, but a small minority does expect something in return for assisting older individuals with their cell phones, such as airtime, money, or the use of the phone.

The social dynamics around cell phones stimulate negotiation around using, sharing or borrowing the phone. In deprived contexts in which multigenerational households rely on older adults' state pensions, cell phones become the currency for connectivity. At the same time, the majority of older persons are dependent on younger people to assist them with their cell phones. This intergenerational interdependency involves the relational history as well as the nature of the relational interactions which play out both in private and public domains (see Chap. 7; Smith-Acuña, 2011). Any ICT intervention for this cohort of older individuals involving cell phone devices should therefore acknowledge and approach it as a generational

project. Drawing on these findings, the following recommendations are made in Box 6.1 for planning *e*Interventions.

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**Box 6.1**
**Points of departure to plan *e*Interventions for older South Africans**

- Multigenerational (intergenerational) households
- Access to phones
- Agency to determine what is done with them

**Recommendations for planning and implementing *e*Interventions**

– Accommodate older individuals' phone preference for less complicated devices and provide alternative avenues to obtain information, such as a USSD code.
– Provide opportunities for older persons to upscale their use of different cell phone features on smart or pushbutton phones to support the uptake of the intervention.
– Support older individuals with limited financial resources, such as providing back-end funding to enable their access.
– Use push notifications with relevant information to reach older cell phone users without requiring independent use of setting an alarm or using advanced phone features.
– Use the intergenerational interdependence of this particular cohort of older persons through formal programmes to promote older individuals' use of cell phones and thereby their access to *e*Interventions.

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## 6.5 Implications of Results for ICT Interventions

This baseline story of a cohort of older South Africans' cell phone use amplifies two aspects deemed to be fundamental to the involvement of older adults in *e*Interventions; a generational perspective and their autonomy, centred on their ownership and use of cell phones:

– It is evident from the data that any *e*Interventions in which older people are involved should be planned and designed as a generational project. The cell phone generates generationality, simply by use of its functions through the support and assistance of younger and digitally knowledgeable generations. This inter/intragenerational effort simultaneously elicits support and assistance from the generational other or mediates and maintains generational (filial) belonging. The digital/resource divide and subsequent dependencies present an imperative towards generational solidarity. Younger people provide assistance and support to older individuals, who in return provide resources in the form of data or (the use of) cell phones (thanks to the older persons' state grant). These

dependencies are continually being negotiated by the generations; the insertion of objects (cell phones) into everyday lives and the access to and handling of these goods are dependent on constraints and social hierarchies. De Bruijn et al. (2009 p.12) characterize Africa's "mobile phone culture" as a dynamic space in which cell phones are appropriated and used as a means of social change and development (also see Goggin, 2006; Katz, 2006). In this social space around cellular communication technology, new forms of social action come into being; a material item such as the cell phone mediates between social individuals and groups; and various kinds of agencies, both human and non-human. The cell phone itself allows and limits communication and social action. Cell phone culture thus integrates expectations as well as the social, economic and political trajectories that exist in other dimensions of everyday life.

– According to this baseline story, older persons maintain their authority despite their dependency on practical support from younger generations in order to access and use relevant technology. They are not passive actors but actively initiate cell phone usage, albeit by proxy because of the intervention of surrogate users. There are various cultural and practical dynamics that push older users to insert go-betweens in their cell phone communications. The cell phone thus mediates intergenerational relationships and impacts power relations.

## 6.6 Limitations

The study has several limitations and therefore the results should be interpreted with caution. Quantitative findings from cross-sectional studies are not only limited in terms of generalizability but also in respect of the conclusions that can be drawn in terms of the direction of relationships. We align with the notion proposed by Spector (2019) to use cross-sectional designs when limited information exists regarding a phenomenon (as is the case with cell phone use by older persons in South Africa), and do not draw cause–effect conclusions. A carefully designed longitudinal study (see Spector (2019) for recommendations) is suggested for future research in gerotechnology. To this end, a partnership with the Department of Health at the Blekinge Institute of Technology is envisaged where a future (South) African project speaks to a section of the Swedish National Study of Aging and Care (SNAC). SNAC is a longitudinal cohort study of a representative sample of the ageing Swedish population that began data collection in 2001 and is a comprehensive, interdisciplinary study that investigates the health and living conditions of the Swedish population aged 60 years and older, including issues of gerothechnology.

This study also used self-report data, which are known for their common method bias (CMB). CMB may distort relationships between variables (Spector et al., 2019) and for this reason several authors (Podsakoff et al., 2003, 2012; Spector et al., 2019) provided methodological and statistical ways in which one can minimize CMB.

Another limitation of the study pertains to the RMSEA value of the three measurement models (for knowledge, skills and attitudes). The RMSEA value remains a popular fit statistic to assess goodness of fit but its performance may be problematic in models with small degrees of freedom (d*f* ). In such instances, the RMSEA value would be unusually large and indicate poor model fit even though the other fit indices indicate the opposite (Curran et al., 2003; Kenny et al., 2015). Some authors go so far as to argue that this fit statistic should not be calculated when the model's d*f* is small. However, if researchers wish to calculate and interpret this statistic, it is recommended they redesign a study to include more (complex) indicators to avoid having a low d*f* model (Kenny et al., 2015).

Although care was taken to sample older persons from a variety of communities (that is, by increasing the heterogeneity of the sample), the total sample was not only small but also limited to two provinces. This hampers the generalizability of the findings. Future studies should consider gathering data from larger samples (also in other provinces in South Africa) using random sampling techniques to enable group comparisons and generalization. Larger groups will also provide more opportunities for group comparisons (especially in cases in which differences are presented as trends observed rather than as statistical evidence for significance). Last, the reversed scored items (in the skills and attitudes scales) proved to be problematic as they did not load significantly onto their respective factors, and their usefulness should be reconsidered in future studies.

## 6.7   Conclusion

Against the backdrop of four communities in South Africa, this chapter provides some basic data on older persons' cell phone use and how we might make sense of their everyday ICT practices and dynamics using this technology. The use of cell phones by the study population reflects the typical complexities of a developing country, exacerbated by an unjust past, which provoked extreme systemic inequalities between disadvantaged Black older individuals in comparison with their White counterparts. This affected their competency properly to utilize available ICT in the form of a cell phone. Nevertheless, the generally positive attitudes of older persons towards cell phone technology and the way in which these older generations leapfrogged into its acceptance (even ownership) potentially provide opportunities for access and participation despite some of the cumulative historical disadvantages. The potential to involve older individuals in *e*Interventions for participation in service delivery as well as social and healthcare management offers numerous developmental opportunities.

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# Chapter 7
# Intergenerational Experiences around Older Persons' Cell Phone Use in Formal Public Domains

**Vera Roos, Jaco Hoffman, and Choja Oduaran**

**Abstract** Formal intergenerational programming is a neglected aspect of social development in sub-Saharan Africa. This chapter describes interactional experiences between older and younger people around older persons' cell phone use, situated within formal intergenerational activities in public domains. Qualitative data from older persons (responses to an open-ended question, 14 semi-structured interviews, and 22 focus groups), and from student fieldworkers (younger people unrelated to them) (135 written reflections and two focus groups ($n = 25$)), were analysed thematically. We found that, before the intergenerational activity, ambivalent perceptions and accompanying tensions were typical, indicating prejudice and intergroup differences on both sides. Participation in formal activities, however, brought mutually rewarding experiences, with expressions and satisfaction of needs (affirmation) and social goals (learning about cell phones). Intergenerational interactions are embedded in broader socio-economic and digital environments and informed by sociocultural norms. Although those in the private domain were not studied specifically, they emerged spontaneously and revealed ambivalence, tension and ineffective relational dynamics as well as supportive and optimal relations. Our intergenerational findings demonstrated that promoting older individuals' optimal use of technology would require some form of formal intergenerational programming facilitated through effective interactions between older and younger people, which would also bring satisfying experiences to both groups.

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## 7.1 Introduction

Digital devices, such as cell phones, offer the potential to facilitate intra/ intergenerational contact zones (ICZ), both virtual and face to face. These zones offer opportunities and spaces through which different generations can meet and interact towards building trusting relationships. There may even be the possibility of working on a joint project or addressing a particular issue together (Kaplan et al., 2020). Participants in an ICZ at a given time are actively (though not necessarily consciously) constructing and refining meanings as they engage with one another. They may also influence how these settings might function, particularly around the digital devices. Besides drawing attention to the physical configuration in which different generations congregate (with, in this case, the cell phone as mediating instrument), intergenerational researchers and practitioners need to consider socio-cultural, political, economic, and historical environments that inform the way in which people view and value the zone as it flexibly manifests at a particular time. This chapter situates interactions between generations within a digitally transformed world in which technology is increasingly adopted as a means of communication and care provision on different levels.

More and more, technology is finding its way into a range of intergenerational activities (involvement in once-off events) or programmes (structured or in the form of longitudinal engagement) (Kaplan et al., 2017) to promote the ideal for age-inclusivity (Particio & Osorio, 2016). Cell phones exercise a mediating influence in these intentionally socially designed activities or programmes involving different generations. We report here on interactions in our we-DELIVER project—collecting data to develop a technology artefact and introducing it to the older participants—between the book-end generations of older participants and younger student fieldworkers (groups of people not related or previously known to each other) as they engaged in a formal intergenerational activity, in the public domain, around older persons' use of cell phones.

### 7.1.1 Intergenerational Interactions in Informal and Formal Contexts in the Private and the Public Domain

Interpersonal contexts are distinguished as informal and formal. The informal context is situated in the private domain, where interactions are informed by a history, a systemic structure that developed over time, and by the dynamics of preserving the relational system (Smith-Acuña, 2011). The formal context is situated in the public domain where interactions are informed by agreed upon socializing
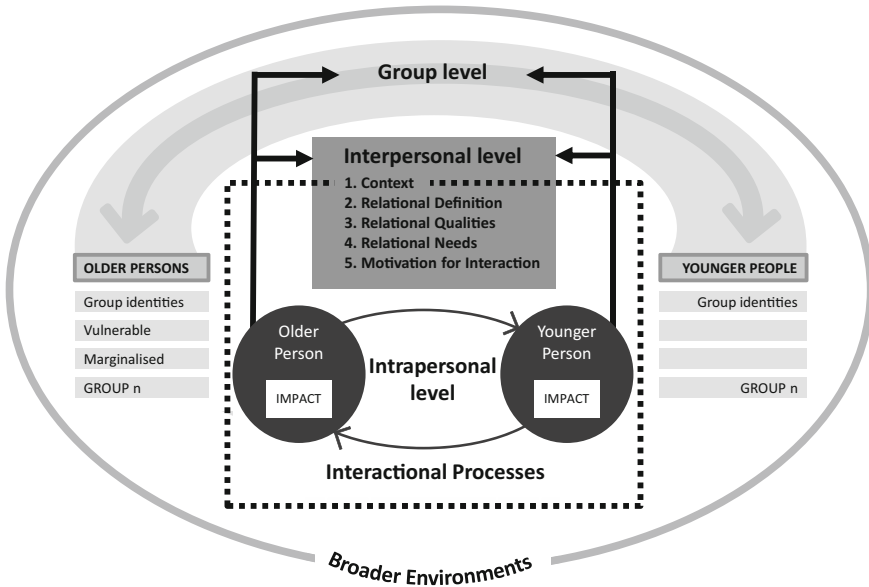
**Fig. 7.1** Key features of self-interactional group theory (adapted from Roos, 2016, p. 146) that proposes three interactive levels (intrapersonal, interpersonal, and group) of interaction as they apply to the engagement in the present study between the two groups of older persons and younger people

norms and expectations for the interactions (Harrell, 2018). While face-to-face interactions between generations around the cell phone often evolve intuitively and serendipitously within the informal private domain, the public domain demands a more planned and programmatic approach. Interactions between the book-end generations for this purpose are analysed in our study by drawing on the self-interactional group theory (SIGT) (Roos, 2016).

## 7.1.2 Theoretical Framework

The self-interactional group theory is informed by interactional pattern analysis, humanistic theory, general systems theory, and interpersonal communications theory (Roos, 2016; Swart & Wiehahn, 1979; Vorster et al., 2013). Analysis using SIGT suggests intergenerational interactions on three levels: intrapersonal, interpersonal, and group. All three are continuously evolving and are informed by the broader sociocultural, political, and historical environments in which they occur (see Fig. 7.1). From a pragmatic view, analysis of the multidimensional and ever-changing interactions requires a specific focus or what Vorster (2011) refers to as punctuation, on a specific level: intrapersonal, interpersonal or group.

The intrapersonal level describes the subjective impact (emotions) or "affective engagement variables" (Harrell, 2018, p. 257) between those who are interacting. People who are interacting with each other register the subjective impact consciously or unconsciously and react to it (Hill et al., 2007). This impact indicates what is transpiring on the interpersonal or group levels (Roos, 2016).

Five components are distinguished on the interpersonal level according to:

1. The definition of the relationship—as complementary, in which one person moves for control and the other adopts a submissive position; or parallel-defined, in which the two participants each accept an equal position (such as friends); or symmetrical, in which the participants struggle for control (Haley, 1963; Jackson, 1965);
2. The interpersonal context (formal and informal), which provides a frame or boundary for the intergenerational interactions between people who know each other (and are related or not related) or between people who are unfamiliar and not related (Roos, 2016; Vorster et al., 2013);
3. Relational qualities (Roos, 2016) or what Watzlawick et al. (2011) refer to as content and relationship components (see Table 7.1);
4. The motivation for the interaction, which could include addressing needs, such as affirmation, inclusion, or achievement of a social goal (e.g. obtaining information about older adults' cell phone use or transferring knowledge); and
5. Dynamic interactional processes (Roos, 2016; Vorster et al., 2013).

The group level describes intra- and intergroup behaviour and dynamics in terms of the social stratification of differences, associated value and significance of the group, and the activation of group identities (Harrell, 2018; Roos, 2016; Tajfel, 1982).

## 7.2 Method

A qualitative descriptive research design (Sandelowski, 2000, 2010) was applied; first, to obtain the subjective experiences of the interactions from the perspective of older persons and younger student fieldworkers and, second, to provide a detailed, focused account of the interactional experiences and their dynamics as they occurred in formal interpersonal contexts (Levitt et al., 2018; Willis et al., 2016).

### 7.2.1 Research Context and Participants

Researchers and student fieldworkers of North-West University's (NWU) three campuses obtained information about older South Africans' cell phone use in three communities, in rural Lokaleng and urbanised Ikageng and Sharpeville, adjacent to the respective campuses. (For a summary of the communities' population structure, household income and household structure, see Tables 3.1 and 3.2 in Chap. 3.)

**Table 7.1** Examples of relational qualities (in no particular order)

| Relational quality | Description | Supporting references |
|---|---|---|
| Self-presentation | Clear communication or creating a clear boundary around the interaction; or in contrast unclear self-presentation (e.g. talking too fast; use words ambiguously) | Johnson (2006) Roos (2016) Roos (2018) Vorster et al. (2013) |
| Emotional closeness/ distance | On a continuum from too close to too distant. Influenced by the length of the relationship; type, nature and history of the relationship; and the context in which interactions take place | Roos (2016) Roos et al. (2019) Smith-Acuña (2011) Vorster et al. (2013) |
| Empathy (cognitive/affective) | Ability to assess verbal and nonverbal messages accurately and respond cognitively (seeing, imaging, thinking) or affectively (communicating compassion and understanding) | Howe (2012) Rogers (1957) Roos (2016) Roos and Du Toit (2014) Roos and Wheeler (2016) Vorster et al. (2013) |
| Perspective taking | Understanding the perspective of the other person or viewing the interaction from one's own point of view | Biggs et al. (2011) Roos (2016) Roos and Du Toit (2014) Roos and Wheeler (2016) Vorster et al. (2013) |
| Congruence/ Incongruence | Correspondence between verbal and non-verbal responses | Roos (2016) Roos and Du Toit (2014) Vorster et al. (2013) |
| Acceptance: Uncondi-tional/ Conditional | Having an unconditional positive regard for, or con-ditional, judgemental acceptance of others | Roos (2016) Truax and Carkhuff (1967) Vorster et al. (2013) |

**Table 7.1** (continued)

| Relational quality | Description | Supporting references |
|---|---|---|
| Degree of interpersonal flexibility/rigidity | Ability to adjust to different contexts or conditions on a continuum ranging from over-flexible to rigid | Chigeza and Roos (2012) Roos (2016) Roos and Du Toit (2014) Roos and Malan (2012) Vorster et al. (2013) |
| Skills to meta-communicate | Adopting a higher order perspective to explain relational interactions; moving to different perspectives to explain the interactions | Roos (2016) Roos (2018) Vorster et al. (2013) |
| Locus of control | Internal or external control over environment | Roos (2016) Rotter (1966) Vorster et al. (2013) |

Two trends, which concern the multigenerational structure of households in these three communities as well as household income, are of special relevance to generational dynamics (Stats SA, 2011).

– Although older cohorts (65 years and older) represent a relatively small portion of the total population (Stats SA, 2011), they head a disproportionally large proportion of large multigenerational households with 5–7 members, as well as those with 8 or more members.
– In the three areas studied in the we-DELIVER project, 1410 households were headed by individuals aged 65 years and older with a monthly income of R3,183 (US$224) or less; of these individuals, 108 (7.66%) received R800 or less per month. These income levels indicate that most of the older people heading these households were recipients of means-tested old age grants (Stats SA, 2011).

A summary of the research parameters is presented in Table 7.2, including the study site settings, languages spoken by the older participants, and subject disciplines of the student fieldworker participants, as well as the different types of data collected from each.

Rich and detailed qualitative data obtained from older participants and student fieldworkers representing different generational perspectives were used in the analysis and discussion of the findings (Ellingson, 2009; Morse 2015).

**Table 7.2** Research parameters

|  | Participants | |
| --- | --- | --- |
|  | Older individuals | Student fieldworkers |
| Communities and related NWU campuses | Communities<br>Lokaleng (rural area)<br>Ikageng (large town)<br>Sharpeville (large town) | NWU campuses<br>Mahikeng<br>Potchefstroom<br>Vanderbijlpark |
| Languages of older participants and students fieldworkers' subject disciplines | Languages: Setswana, Sesotho, isiZulu, English | Subject disciplines:<br>Psychology ($n = 18$);<br>Social work ($n = 11$);<br>Public administration ($n = 131$) |
| Data-collection methods | Answers to an open-ended question at the end of the questionnaire ($n = 285$); semi-structured interviews ($n = 14$); focus groups ($n = 22$) | Written reflections after every interaction ($n = 135$); focus groups ($n = 25$) |

Setswana, Sesotho, isiZulu and English are four of the 11 official languages of South Africa
A total of 285 of the 302 participants in the we-DELIVER project answered the optional final open-ended question in the questionnaire (for qualitative analysis). Of the 302, 184 participated in 22 focus groups and 14 in the semi-structured interviews

## 7.2.2 Procedure and Data Collection

We adopted two heuristic constructs, situatedness and relationality, to guide our ethical conduct in planning and implementing the community-based project in relation to the different members of the research team and to the older participants (see Chap. 4). Students from different disciplines were invited to participate as volunteer fieldworkers, and as younger participants in the intergenerational research activity. These younger persons represented the South African language groups in the different community settings (used as a proxy for sociocultural groups) and they came from rural and urban areas. In a few instances, the students were from the same communities as the older participants, but they were not relatives.

On joining the project, the student fieldworkers attended preparatory presentations on the following topics: contextualizing ageing internationally and in South Africa; community engagement (including interacting with older participants); conducting qualitative interviews; and completing questionnaires by using survey analytics on electronic devices. All of them thereafter were involved in some aspect of the project, such as collecting data, providing administrative support, preparing or serving refreshments, or disseminating the Yabelana app and USSD code. Fieldworkers received a financial token of appreciation from funding awarded for the project.

The locations of Lokaleng, Ikageng, and Sharpeville determined how access was gained and how older participants were recruited and sampled. Older men and women in Lokaleng and Sharpeville gathered as a group at a communal site,

where data were collected. In Ikageng, transport was arranged on two occasions to take older individuals from various luncheon clubs ($n = 32$) to a venue large enough to host the older participants and the student fieldworkers.

On the days of data collection, willing older participants and student fieldworkers were paired to complete a questionnaire on digital devices about older persons' cell phone use. Pairing in this way was informed by the assumption that a pre-existing moral relationship between the two generations would be activated (Edwards, 2009). Of the 302 older persons who completed questionnaires, 285 answered the last open-ended question, "How did you experience this data gathering session?" Older participants who were willing also took part in semi-structured interviews or focus groups. At the end of each data-collection event, older participants and student fieldworkers enjoyed refreshments and socialized.

The students, who had signed a confidentiality agreement, transcribed the semi-structured interviews and the focus groups verbatim. Findings were analysed and used to develop the Yabelana ecosystem (website, app and USSD code) (see Chap. 8). The same strategy that had been used for accessing older individuals for data collection was followed to introduce the Yabelana (app and USSD code) in Lokaleng and Sharpeville. To promote inclusivity, the older persons in Ikageng requested that the Yabelana app and USSD code be presented at their luncheon clubs, which meant that 32 different sites were visited. To reach the older persons across Ikageng, seven postgraduate research psychology volunteers assisted the two groups (older local participants and young student fieldworkers); they contacted the chairpersons of the luncheon clubs to arrange a suitable date and time for the visit. Transport was also arranged for the student fieldworkers involved in the data collection and who had agreed to introduce the Yabelana app and USSD code to the older individuals. The student fieldworkers joined the luncheon clubs' formal programmes, which sometimes included doing exercises (see Chap. 4). Afterwards, the older individuals and student fieldworkers formed groups of no more than four people, in which the students introduced the Yabelana system. The students were then invited to write down their reflections of the interactions with older participants (see Box 7.1).

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**Box 7.1**
**Prompts to elicit student fieldworker participants' written reflections**

- How did you experience interacting with older persons?
- What did you learn about research/community engagement?
- Include at least three verbal responses of the older persons during the interaction.
- Did the older persons make any recommendations for improving the Yabelana App or USSD code?
- Do you have any recommendations for improving the Yabelana App or USSD code?

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**Box 7.1** (continued)

**Questions used in the focus group discussions with student fieldworker participants**

- How did you experience interacting with older persons as a group of younger people?
- Is there a difference between interacting with unrelated or unfamiliar older participants and older persons related to you?
- If so, why?
- Probing questions were asked, such as: What helped you to be patient with the older participants?

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## 7.2.3 Data Analysis

The documents with data transcribed verbatim were anonymized and uploaded on ATLAS.ti 8 and analysed. The analysis process took place in three phases to limit researcher bias (Morse 2015).

In Phase 1, five postgraduate students, who had not been involved in the project implementation, independently conducted a first round of analysis to include multiple and varied voices (Tracy, 2010). They analysed the data thematically following some of the steps suggested by Clarke and Braun (2013): read and re-read the documents to familiarize themselves with the data, determined initial codes and assigned labels. Next, student analysts and researchers engaged in a discussion of the provisional codes. This session aimed at obtaining "member reflections", to offer an opportunity for reflexive collaboration (Tracy, 2010, p. 844).

Phase 2 involved an independent round of analysis. Codes were reviewed and merged with similar codes, or split when they were too broad. Relationships among codes were searched, and potential themes were reviewed, defined, named, and supported with verbatim quotations to enhance the trustworthiness of the findings (Lincoln & Guba, 1985).

In Phase 3, we conducted a deductive analysis (see Hsieh & Shannon, 2005) of the themes obtained in Phase 2 with the aim of identifying the specific strategies the student fieldworkers had employed in their interactions with the older participants. We applied the theory informing the interactional pattern analysis and SIGT (see Roos, 2016; Vorster, 2011; Vorster et al., 2013) to predetermine the codes that we used to identify the strategies. (see Theme 3 in Table 7.3).

The analysis of the data aimed at producing new understanding of the social world of intergenerational relations—specifically, of the communities we were studying, and with the aim of informing and improving methods of intergenerational programming for future support purposes.

**Table 7.3** Themes and subthemes from interactions between older participants and student fieldworker participants relating to cell phones

| Themes | Older participants' perspective | Younger student fieldworker participants' perspective |
|---|---|---|
| Generational perspectives of older participants and younger student fieldworker participants | Older participants' perspectives of younger people familiar to them:<br>– Ambivalence<br>– Perceptions of younger people as opportunistic | Student fieldworkers' perspective of older persons:<br>– Views about older persons in general<br>• Stereotypical views<br>• Different from younger people<br>– Views about familiar older persons (related or unrelated) |
| Outcomes of the intergenerational activity | Older participants in relation to younger student fieldworker participants and younger relatives:<br>– Student fieldworkers<br>• Positive emotions and effective relational qualities<br>• Needs and social goals satisfied<br>– Familiar younger people (happy about independent phone use) | Student fieldworkers in relation to older participants and familiar older people:<br>– Older participants<br>• Positive emotions and effective relational qualities<br>• Challenging expectations, needs, and goals<br>• Need of affirmation addressed<br>• Previous assumptions changed<br>• New appreciation<br>– Familiar older persons (new awareness of needs; intention to be tolerant) |
| Creating an optimal context for interactions | | – Organizing the physical space<br>– Creating a clear interpersonal context<br>– Defining the relationship with the older persons<br>– Flexibility<br>– Empathy, unconditional acceptance, and perspective taking<br>– Self-presentation |

This theme (creating an optimal context for interactions) was derived from the analyses of the students' reflections (see 7.2.3)

## 7.3 Findings

Themes relating to the interactional experiences of unrelated older participants and student fieldworker participants in the intergenerational activity are reported in Table 7.3, supported by the experiences of the interactions and relational dynamics between the two groups. The private domain had not been deliberately explored in this activity, but experiences of interactions between older and younger family members or acquaintances in the informal and private domain emerged spontaneously, offering useful points of differentiation between the two domains.

### 7.3.1  Generational Perspectives of Older Participants and Student Fieldworker Participants

The older participants shared with the student fieldworker participants the experiences of their interactions with younger relatives around their cell phone use. Before the intergenerational activity, the student fieldworker participants' views of older persons in general were stereotypical and they perceived the older generation as different from them.

#### 7.3.1.1  Older Participants Perspectives of Younger People Familiar to Them

The older persons were ambivalent about young people, viewing some of them as opportunistic. They referred to competing (positive/negative) emotions (Lüscher, 2002) in relation to their younger relatives.

*Ambivalence* The older participants explained to the student fieldworkers that related younger people were sometimes happy to provide assistance to the older generation because these are their elders: "They help us because we are their grandparents." They reported that some of the younger people helped the older persons willingly and regularly. An older man told a student fieldworker how he received the help he needed from his grandchildren, and that they helped him regularly with his cell phone if he needed it. By contrast, some older participants recounted how some of their younger relatives responded to them in a judgemental and demeaning way when help was requested: "With me the problem is that my children are very impatient, if they show you something and then you take too long, they disregard you. Then they would say: 'No! No! You are a slow learner'". Many of the older participants described some of their younger relatives as impatient or unwilling, as illustrated by the following discussion between a student fieldworker and three older participants:

*Student fieldworker*: I heard some of you were saying your children don't have patience when helping you with cell phones. What do they say when you ask them for help?

*Older Participant 1*: My own child told me that she can't help me because I don't grasp quickly.

*Older Participant 2*: My child says that he is too lazy to actually go the extra mile of helping me because I take time to grasp things.

*Older Participant 3*: My child says he is tired of teaching me one thing. I only know how to answer calls and speak to the people calling me.

***Perceptions of Younger People as Opportunistic*** Older participants shared the perception that when related younger people assisted them with cell phones, some viewed the activity as an opportunity to help themselves to airtime:

> You know, these children when they have access to your phone, they no longer answer your calls. They reject them and then make calls to their friends. When the phone rings and you ask them who it is, they tell you something that doesn't make sense.

This participant said she therefore preferred to answer her phone herself: "So I would rather take care of my own calls, that way I am safe." Another participant explained that she was obliged to keep a close watch on younger people to protect her airtime when they were helping her with her cell phone: "So now you have to sit next to them so that you can monitor whether or not they are doing what you asked them to do. Otherwise if you don't do that, that little airtime you had is gone."

Older participants also perceived some younger family members taking advantage of their elders' ignorance about cell phones, as well as trying manipulatively to access their airtime. In the following conversation, an older woman explained how the younger people had tried to trick her into believing that she could get into debt with a prepaid cell phone account:

*Older Participant*: They say [nickname of participant] you have to buy R10 airtime. You have big debt—more than R20 [less than US$2]. The network people won't give you [any] airtime.

*Student fieldworker*: And then?

*Older Participant*: Then they will ask me: "Could I please contact my mother?" Then she takes the phone to the room and contacts her mother with it. The phone returns without any money. They take the airtime. When I check the balance, she ate [used up] all the airtime that I bought.

### 7.3.1.2 Student Fieldworkers' Perspective of Older Persons

Student fieldworker participants in the intergenerational activity drew a distinction between older persons in general and familiar older individuals.

***Views about Older Persons in General*** The student fieldworkers indicated that they viewed older persons generally in a stereotypical manner, being aware of the differences between the two generations.

**Stereotypical Views** Several students expressed ageist and stereotypical views of older persons, as one of them explained: "I had the idea that the [older] participants would be short of energy and disinterested. My expectations prior to the meeting was that I would not understand the participants." A postgraduate student involved in the analysis of the student fieldworkers' reflections summarized the stereotyping tendency as follows:

> While reading the reflections of the students these biases and stereotypes regarding older people became clear as most of them have some form of preconceived notion of elderly people.

**Different from Younger People** The student fieldworkers highlighted the differences between themselves and the older generation as it expresses itself in behaviour:

> I feel that we all know that we have to be patient with older people, but in reality, because of the differences between us, we tend to be impatient and even rude. I think that we tend to be more patient with children and other people close to our age, but as soon as we engage with an older person, we forget our manners.

***Views about Familiar Older Persons (Related or Unrelated)*** The students described their interactions with their older relatives in terms of the subjective impact associated with feeling judged, and the fact that they were expected to accept older persons manoeuvring for control in the relationship with older persons in the leading and younger people in a submissive position. This description refers to experiences within what is called a complementary defined relationship (Haley, 1963; Jackson, 1965), as illustrated in the discussion between the researcher and three student fieldworkers in which they distinguished between interacting with older relatives and unfamiliar older participants in the study:

*Researcher*: Why is it easier when you give information about using cell phones to people that you don't know so well?

*Student fieldworker 1*: They won't judge you.

*Student fieldworker 2*: Because older people don't like listening to younger children. You're not as experienced compared to them.

*Student fieldworker 3*: There is a shift from someone that you know who is always with you and you are always impatient towards. It's a different [from a] person you just met. You become this respectful down-to-earth [person] and you are patient and just want to help them.

Our study further illustrated the principle that interactions between older and younger people are informed by socializing practices in a particular sociocultural environment. A student fieldworker explained, for example, knowing the right way to behave towards unfamiliar older participants in the study: "I think it was how I was raised. Especially, coming from a rural area, I was taught to respect [the] elderly so it wasn't difficult for me to treat them with respect."

The students also reflected on the relational history that informs interactions between older and younger people:

With people you know you have really built a perception about that particular person. You know their traits already. But with a new person you have to learn who they are before you react to them.

## 7.3.2  Outcomes of the Intergenerational Activity

The perspective of older participants is presented first, followed by that of the student fieldworker participants. The presentation of both perspectives focuses on subjective impact, relational qualities, and needs and social goals in relation to the generational other. The two generations also reflected on the outcomes of the intergenerational activity in the study in regard to older and younger relatives.

### 7.3.2.1  Older Participants in Relation to Younger Student Fieldworker Participants and Younger Relatives

This section begins with the older participants' experiences of the student fieldworkers followed by their experiences of their younger relatives.

**Student Fieldworkers** The subjective impact that older participants expressed was used to identify effective relational qualities in respect of their interactions with the student fieldworkers. In this interpersonal context, the older persons were able to express their needs and social goals for the interaction.

***Positive Emotions and Effective Relational Qualities*** The older participants expressed appreciation in relation to student fieldworkers, as one of them explained: "Your patience moved us." They expressed their gratitude in a manner typical of their sociocultural context, according to student fieldworkers who reflected on the intergenerational activity: "The older people also presented dancing and singing to show gratitude to us as students for our visit to the social club." For some older individuals, interactions with the student fieldworkers were relaxing and soothing: "It was helpful and it helped me release some stress."

We found that the student fieldworkers displayed the following effective relational qualities which generated the subjective impact on the older participants:

– Patience (unconditional acceptance; emotional empathy);
– Understanding (cognitive empathy and perspective taking);
– Friendliness (clarity of self-presentation; perspective taking);
– Attentive listening (unconditional acceptance; affective empathy);
– Demonstration of respect (cognitive empathy, perspective taking and unconditional acceptance);
– Being well mannered (adopting a complementary relational definition, with the older persons in a controlling position and the younger people in a submissive position; unconditional acceptance); and
– Being audible and clear (clarity of self-presentation; perspective taking).

These effects are illustrated by the following older persons' comments, as recorded in the student reflections:

> I enjoyed it [the interaction] because you were very friendly, you listened, you were very understanding, and you smiled a lot.

> I am very happy that you were patient with me and showed me respect. It was heartfelt.

> [I am] very happy. The helper [student fieldworker] was patient and audible and very respectful. The helper helped me to understand the [Yabelana] app efficiently. I could understand what she told me and used the language I understand.

> I was satisfied. The children were well mannered [good manners].

***Needs and Social Goals Satisfied*** When interacting with student fieldworkers in the formal intergenerational activity, the older participants expressed their needs (inclusion and affirmation) and social goals (transference of knowledge/wisdom, and learning from student fieldworkers).

The older participants contrasted their need to be included with their experiences of exclusion. One of them explained: "Young people should always do this because we feel left out as older people." They felt that younger people should include older persons because of their age, which makes them needy for care and attention, a sentiment captured in a student's reflection about the older people: "They encouraged us to do more for them and always to consider elderly people as they are the most vulnerable."

The intergenerational activity and involvement of student fieldworkers also succeeded in addressing the older participants' need for affirmation, as was illustrated by two comments from the older persons:

> It's a good thing [obtaining information about older people's cell phone use] because it makes us feel acknowledged as older people and know that young generations care about our needs.

> It was a wonderful day that I spent with the students, and they really asked us about important things and people in our lives.

Being affirmed as an individual contributed to a sense of being safe, cared for, and stimulated, as was made clear in the following appreciative observations from older participants: "I get comfort that there is someone who is interested about my well-being" and "I felt comfortable and at home. I wish that you people would always be here to give us this kind of feeling of a younger and fresher life."

In relation to social goals, older participants wanted to transfer or share their new knowledge or wisdom further, to others. This was captured by a student fieldworker: "They were so happy that they found something important to learn and they can't wait to teach their children." Some also instructed the younger student fieldworkers to "work harder than what they do" and gave them advice about how to approach life in general and interact with other generations:

> They give me words of wisdom and encouragement, taught me how to approach people and situations in life.

They taught me that you should never give up in your life to learn new ideas from new generations.

The older participants also acknowledged, after interacting with the student fieldworkers, that there was more to learn about cell phones: "I feel very glad and humbled to take part in such a project. It made me realize that I need help with a lot of things" and "I feel excited because I've learned some new things I didn't know of." The older individuals wanted to learn more, and specifically from the student fieldworkers. This was illustrated in a student fieldworker reflection: "They said we should come more often with other things to teach."

**Familiar Younger People** The older persons were happy and excited about their newly acquired knowledge and skills in using their cell phones independently. A student fieldworker explained: "Normally older people call the young ones [to help them]. So they were happy that they can do it without them [the younger people]." The older participants expressed a sense of autonomy from obtaining relevant information without having to ask familiar (related or unrelated) younger people for help: "Now I don't have to worry about asking for emergency numbers as this app [Yabelana] does it for me."

### 7.3.2.2 Student Fieldworkers in Relation to Older Participants and Familiar Older Persons

This section reports on student fieldworker participants' views about the older participants in the study, followed by their experiences of their own older relatives.

**Older Participants** The student fieldworkers experienced the older participants in the intergenerational activity positively, as warm and authentic people, but there were also challenges relating to expectations, needs and goals.

*Positive Emotions and Effective Relational Qualities* Some student fieldworkers described an "amazing" subjective impact, and experienced the older participants as "very kind and genuine people, with incredible love and care". They found the older persons to be friendly, open, and enthusiastic (self-presentation), as well as warm (unconditional acceptance):

They [the older persons] were friendly and open to us, as well as to learning about the app. They were also comfortable in talking to us and letting us help them with the app.

We were given a warm welcome by the community and the tribal authority.

They expressed this enthusiasm several times verbally and they also smiled and showed happiness when we participated in their social club.

The student fieldworkers also felt acknowledged when the older participants asked them their names and surnames, which a student explained was a sign of respect: "So for the fact that they wanted to know my surname made me feel she is respecting me. They spoke to me like one of them." The experience of respect was registered as a pleasant subjective impact: "Oh I loved it. Everyone knew my name at the end. I was like my name is [name of student fieldworker] and the auntie [older

person] says: 'It [your name] means water and it so like you.' It was so cute." Such demonstrations of respect for the younger student fieldworkers came as a pleasant surprise, as one of the students pointed out: "Old people will teach you lot of things you didn't expect, for example the respect that they give you, the attention they have, and the manner that shows you that they are willing to understand what you are questioning or teaching them about."

***Challenging Expectations, Needs, and Goals*** Some student fieldworkers also experienced challenges in their interactions with older participants. These resulted from the student fieldworkers' attempts to: (1) reconcile themselves with the socio-cultural accepted norms of showing respect to the older individuals (2) adopt a complementary definition of the relationship with older persons, with the latter in a leading position and the younger people in a submissive position (3) accommodate older individuals' age-specific needs, and, at the same time (4) keep the particular goal of the interaction in mind; to support the older individuals' cell phone use.

The challenges were described as follows by one of the student fieldworkers: "Interacting with the older people was an amazing experience but challenging at the same time, since you had to be patient when interacting with them and respectful at the same time"; adapting to the pace of older persons contributed to challenging experiences: "It was not any easy task as you, as the facilitator, had to accommodate the needs and flow with their pace as some would often request toilet or water breaks or even just to freshen up a bit." The process of repeating new knowledge was also exhausting and frustrating for some, as another student fieldworker explained: "Some [older persons] asking the same questions over and over again. It was hard, I even got a headache. I had to say one thing ten times."

***Need of Affirmation Addressed*** The student fieldworkers experienced affirmation when the older participants acknowledged their patience: "They [older persons] also said they want us to come back to them [in future]. They particularly want us because they saw that we were patient. [They say]: 'We need you'." The older persons also wanted a photo taken of them with the younger people: "They were like '[name of student fieldworker], come take a picture with me.' I was really shocked. So that they wanted to take a picture with me was really nice."

***Previous Assumptions Changed*** After engaging with the older participants, the student fieldworkers reported that their initial assumptions about the older generation had changed for the better. They revisited their views and, with hindsight, reflected about older persons with greater compassion than before:

> Personally, it was a good experience because now I understand that not all elderly people cannot use smart phones without any assistance and just found that actually dealing with the elderly is not boring as I thought.

> This experience has changed my perception about older people and I have realized that even if they have some disabilities due to old age they can still perform well in some tasks and remember what they were taught.

The intergenerational activity sensitized the student fieldworkers' by making them realise that they should not judge people without knowing them. As one of them

confirmed: "This project has shown me that I have to be sensitive towards the people I engage with in the community and not underestimate them."

*New Appreciations* The older persons' drive to find out more about cell phones was a new experience for a student fieldworker, who said: "I've learned a lot from the old people. I learned that they also want to find new ways to understand cell phones." The student fieldworker participants discovered that older persons also shared a basic need to feel valued and acknowledged: "Because in as much as they are old, they also want to be treated like they matter and they are important."

Their new-found awareness of older individuals' needs stimulated the students' understanding of the value of their efforts to improve older persons' quality of life, particularly in low-resourced environments. Two student fieldworkers explained their feelings of satisfaction:

> Knowing that you are contributing to making a person's life better. Especially the elderly and since that people at Lokaleng don't have much.

> I felt like somehow I was able to contribute to their lives being a bit easier because with the services that they got from the app. It was able to meet a lot of needs which they were short of.

**Familiar Older Persons** Awareness of the plight of older individuals in the intergenerational activity also raised the younger people's awareness of the (potential) needs of their own grandparents and older community members:

> [I am] also thinking we are also leaving our own grandparents and grandmothers back home. And to think that they also could need the same services and this can also be helpful if it could just spread out to the community and every other community that has elderly people too.

The student fieldworkers reflected that they now felt they ought to be more tolerant of their older relatives: "Just because me and my gran have different likes and dislikes, and different views on things, doesn't mean that I can disregard her opinions and be impatient when explaining mine." They also pointed out that they could make their relationships with older relatives work more effectively, as one of the student fieldworkers observed: "I realized that I can improve my own relationship with my grandmother, and that it is important for me to have a healthy positive relationship with her."

## 7.3.3 Creating an Optimal Context for Interactions

Effective interactions between older participants and student fieldworkers were the outcome of the ways in which the student fieldworkers built relationships with the older people through respectful dialogue (see Theme 3, Table 7.3).

**Organizing the Physical Space** The physical space in which interactions take place can be either conducive or unfavourable. To use the physical space to create an effective interpersonal context, a student fieldworker changed the height setting of her chair to make it level with an older man's chair. She explained: "When we

started, I noticed that my chair was significantly higher than his and felt that this might influence our interaction. I changed the chair level to meet his before I started."

**Creating a Clear Interpersonal Context** The starting point for effective interactions is a clear interpersonal context; when context is unclear, meaning is obscured (Watzlawick et al., 2011). A student described the detailed process she had used to initiate an optimal interpersonal context for the following goal-orientated interaction with the older participants:

> I started by introducing myself and asking them how they are doing and how life is in general. I also asked them whom they were living with and how they experience the relationships. After a few minutes of introduction, they were comfortable and willing to share some information. I told them why we are there and started explaining everything about the [Yabelana] app, and showed and explained how the USSD works.

The reason for creating a clear interpersonal context was to build a trusting relationship before introducing the Yabelana system, as two student fieldworkers explained: "I had to create a trustful relationship with them so that we get to a point where they are able to freely communicate with me and have a fruitful interaction" and "Building rapport at the beginning of a session [aims] to better teach the elderly about technology."

**Defining the Relationship with the Older Persons** The student fieldworkers initially adopted the socioculturally accepted complementary relationship, with the older persons in a leading and the student fieldworkers in a submissive position (see Sect. 7.1.2 above). A student illustrated the adoption of this relational definition, saying: "Keeping in mind that I have to be sensitive in making sure that I do not order them [older persons] around but instead ask questions. This is because older people like feeling in control, relevant and respected." Had this culturally accepted relational definition been challenged by the younger people at the outset in favour of a symmetrical relationship, effective interactions as well as the goal of facilitating the use of the technology could have been compromised.

The relational definition guiding the interaction can, however, change. During the course of the interactions observed towards the end of the intergenerational activity in our study, when older and younger people interacted more like friends, a parallel relationship was indicated, as illustrated when an older women jokingly asked a student fieldworker: "Will you be my husband?"

**Flexibility** We observed from the data that student fieldworkers demonstrated flexible interpersonal roles in adapting to older persons' engagement with cell phones. Two student fieldworkers explained how they strategized to take account of individual needs:

> You have to work very slowly with the old people. Some will pick it up really quickly and others take longer. So you have to adapt to however they are working.

> I learned that people are different, and you have to handle them differently and adapt to the behaviour.

**Empathy, Unconditional Acceptance, and Perspective Taking** Emotional empathy was displayed when the student fieldworkers correctly identified the emotions of older participants and acted accordingly, as one fieldworker explained:

> There was this other lady, I think she was just holding back because she was struggling to understand and she told me to move on to the next person. So I told her: "No, that's fine, you'll learn." I think she got scared because obviously she doesn't know you and I tell her: "No it's okay. Let's just take a moment." [I] got them comfortable and tell them they are here to learn.

Another student fieldworker emphasized cognitive empathy, perspective taking and unconditional acceptance: "I exercised patience and compassion, as older adults may not [be] familiar with technology and [may] have cognitive problems. Patience and compassion are needed when interacting with older adults." The student fieldworkers listened attentively to the older persons, thereby demonstrating unconditional acceptance, as evidenced by the following comment from one of the students: "I also listened to them when they had things to say. I did this because I knew it will show them that I value who they are as well as what they are saying."

Perspective taking involves a cognitive interpretation of the older individual's situation, whereby the student fieldworkers adjusted their behaviour (demonstrating flexibility) to meet the older participants' needs for support with technology. "I have to develop a sense of patience when working with different people because they find it very difficult to understand how the app works. I was very patient. I introduced the app to them very slowly to [accommodate] their cognition." Adopting the perspective of the older persons informed the ways in which the younger people talked to the older persons and the words they used: "When talking with older people you need to watch and be aware of the language you use and speak to them with respect and patience."

**Self-presentation** The student fieldworkers presented themselves clearly in terms of their pronunciation, articulation and speech tempo, and used comprehensible words. The student fieldworkers applied this strategy in a context-sensitive manner, as was evident from the following two reflections:

> I used the language which they [the older people] understand (Setswana) and maintained eye contact[1] so that they don't feel disrespected.

> I used clear Setswana in interacting and communicating with the older people to make sure that they understood everything, and I made sure. I talk loud enough for them to hear me because I understand how they are struggling to hear.

We believe that the optimal interpersonal context created by the student facilitators could have resulted from the preparatory discussions they had attended before setting out on the intergenerational activity, as part of their formal professional training:

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[1]Maintaining eye contact with older individuals is context-specific and not the custom for all cultural groups in South Africa.

> If you go to an environment you need to be professional. From a professional perspective I know you have to, regardless of their age, respect people for who they are. So from that perspective that's why I was patient with them.

## 7.4   Discussion

The interactional experiences resulting from the formal intergenerational activity in our project, involving younger participants engaging with older persons around the latter's cell phone use, demonstrated important connections and contrasts between relationships of older and younger people in their public worlds. Even though we did not explicitly study private domain intergenerational interactions, salient details emerged during the public domain discussions between the two groups in our study as well as in the students' subsequent reflections. The intergenerational activity in our study yielded information of profound use for delivering programmes designed to assist technology adoption among older persons, and it confirmed the value of involving, in such efforts, in a formal and public domain, younger generations who had no relational history with the older participants.

   The interactions between older participants and student fieldworkers in a formal and public domain presented in different ways. Positive emotions (subjective impact) that accompanied the engagement of the older and younger participants in our intergenerational activity expanded the capacity of both groups to be receptive to each other (see also Fredrickson, 2001; Frederickson, 2013). In combination with the warm and satisfying impacts, the effective relational qualities acted as mechanisms to produce predictable conducive outcomes; the older participants and the student fieldworker participants both reported that their needs for affirmation were addressed and both groups felt that they were able to achieve social goals in the interactions. Similar interplay between context and relational mechanisms that resulted in optimal outcomes was also found in another intergenerational activity (Chigeza et al., 2020) in which older and younger participants engaged in a formal, public domain. However, in our study, the younger people also registered a subjective impact associated with negative emotions in relation to the older participants, which they managed to contain and despite of it they could still create an optimal interpersonal context for the interactions. The exercise appears to confirm a tendency among people to react in ways that correspond to the impact they subjectively register; furthermore, through training or experiential exposure, they may learn to overcome such tendencies in order to respond effectively (see Roos, 2016; Vorster, 2011). Our finding that training can successfully lead to the facilitation of optimal interactions holds promise for the planning of future formal intergenerational programmes.

   In our study we observed how the younger people's stereotypical perceptions about the older generation changed as a result of the intergenerational activity. The literature confirmed that older and younger people's perceptions that developed over time in different interpersonal contexts typically change after participation in intergenerational activities or programmes (Chigeza et al., 2020; Roos et al., 2017; Smith-Acuña, 2011), drawing on contact theory explanations (Allport, 1954;

Harrell, 2018; Tajfel, 2010). The findings indicated that programmes to assist with technology adoption by older people can benefit from the involvement of younger generations who are socioculturally attuned to the older individuals.

The recommendation that intergenerational programming should consider the formal and public domain as the most beneficial interpersonal space for implementation is juxtaposed by the reported experiences of interactions in the informal and private domains. Older participants expressed ambivalence associated with familiar younger people whom they ask for help with cell phones; while some younger people helped willingly and efficiently, others responded in a judgemental manner. Interactions between older and younger people around cell phone use and airtime in this interpersonal context are also seemingly saturated with controversy. We drew this conclusion from older participants' accounts of difficult discussions with younger related people around air time and cell phone use; the older adults' enthusiastic expression of a sense of agency to use the technology; and the relief some expressed that, after the interactions with the student fieldworkers, they were no longer solely dependent on familiar younger people to help them to use this technology. Younger people also reported strained interactions with familiar older persons in the informal and private domain.

We cannot generalize from these findings, or assume that the achievement of an optimal interpersonal context in a one-off intergenerational activity can change older and younger generations' attitudes or behaviour when dealing with the other. Furthermore, our intergenerational activity involved student fieldworkers who had specifically been prepared for the task of creating an optimal interpersonal context before interacting with older individuals. It is possible that the students could have acted from a position of compliance in relation to their lecturers or older researchers; it would be worthwhile to consider power dynamics when planning formal ICT programmes for implementation in the public domain.

The findings from the intergenerational activity in this study underlines the potential of involving older and younger people in interpersonal contexts in the public domain, provided the programmes are designed to achieve optimal conditions and to overcome potential barriers between old and young. To this end, drawing on an intergenerational activity around older persons' use of cell phones, some suggestions are offered in Box 7.2.

**Box 7.2**
**Suggestions to inform the design of intergenerational technology aciticies or programmes**

- Plan intergenerational interactions for formal interpersonal contexts in the public domain with clear goals for the interactions.
- Consider the interests of both older and younger generations.

**Box 7.2** (continued)

- Involve younger people who are familiar with the sociocultural context of the older people, and who know how to act and react in an acceptable manner, according to the relevant implicit norms, customs and practices.
- Engage in reflective discussion to note reactive responses associated with intergroup differences.
- Train facilitators using behavioural practitioners to create effective interactions that are likely to promote cooperation during intergenerational exchanges.
- Prepare to create an optimal interpersonal context (sufficient trust, comfort, respect) before introducing technology to older participants through strategies such as:
  - organizing a conducive physical space for the interaction, which includes a space in which the participants are clearly visible, facing each other from a relatively close distance, without barriers (such as tables), and with their eyes at the same level;
  - accepting the initial relational definition older adults introduce, to avoid struggles for control that could compromise effective interactions;
  - creating a clear interpersonal context: the context determines the meaning of the interaction and can also alter behaviour; a clear context is created by determining the rationale for the interaction, and making certain that each side has sufficient knowledge about the purpose of the interaction and technology, and expectations to ensure that everyone is on the same page;
  - adopting a relationally focused approach from the outset of the engagement, and meeting older individuals in the here and now, on an appropriate emotional level; and
  - displaying effective relational qualities, such as empathy, unconditional regard and perspective taking, flexibility, and clear self-presentation.

## 7.5 To Conclude

The intergenerational activity described in this chapter engaged with issues surrounding the engagement of two book-end generations, as mediated through cell phone devices, within a formalized public domain of interaction. It demonstrated how the public domain can be a good arena for intergenerational productive activity, and that it can form a successful part of programmes designed to achieve conducive outcomes for older and younger people. Our findings demonstrate that optimal intergenerational interactions can change attitudes and behaviour for the better and thereby broaden the participants' relational repertoires. They can also facilitate social cohesion between generations and transfer relational skills learned in one context to another. The activity reported here has implications for effective intergenerational ICT programme design, implementation and evaluation.

Cell phone devices have the ability to mediate potent opportunities for establishing constructive intergenerational contact zones within multigenerational settings, both in the private and public spheres of life. The right kinds of interaction around these cell phone devices can transcend common communication barriers between generations and help to build relationships, even as the use of ICTs expands among older persons. Given the probability of ongoing digital divides between generations as new technologies develop, ICT is likely to continue attracting attention as a component part of intergenerational projects for a long time to come.

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# Chapter 8
# Yabelana: Designing and Introducing an Age-Inclusive and Context-Specific Information and Communication (ICT) Ecosystem

**Vera Roos and Darelle van Greunen**

**Abstract** Rapid developments in technological applications present as yet underexplored opportunities to assist with the impact of population ageing and limited resources. We adopted a sociotechnical paradigm—interlinking the social and technological—to inform the design and introduction, in four phases, of Yabelana ('sharing of information'), an age-inclusive and context-specific ICT ecosystem. First, drawing on data from the we-DELIVER research project, we defined the situatedness of a cohort of older participants, their needs and preferences in relation to cell phone technology and social systems (intergenerational relations) facilitating their ICT use. Second, the three-part development of the ICT ecosystem was approached pragmatically. Third, to introduce the Yabelana app and USSD code we involved student fieldworkers familiar with the language and culture of the participants. Fourth, the process of collecting, analysing and reporting the fieldworkers' reflections and older individuals' experiences informed recommendations for further improvements of Yabelana and of technology artefacts. We conclude that a user-centred and bottom-up approach is not a quick fix for promoting age-inclusiveness in technology. Rather, ICT use is the outcome of a complex combination of older users' dynamic involvement with technology, their diverse needs and preferences, facilitating social systems (e.g. intergenerational), and broader sociocultural contexts.

**Keywords** Age-inclusive · Context-specific · Information and communication technologies · Older user-centred technology · Sociotechnical paradigm · Technology · Yabelana ICT ecosystem

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## 8.1  Conceptual Boundaries around Age-Inclusive and Context-Sensitive ICT

The growing number of non-specialist technology users, including older individuals, and impressive digital advances since the beginning of the century offer unprecedented opportunities for developing ICT for people of all ages. In the field of human–computer interaction (HCI), ICT design involves the interdisciplinary "interactive and collaborative engagement" of the social and computer sciences (Tebes et al., 2014, p. 477). The purpose, motivation, and desired outcomes of technology are informed by different paradigms or world views (Kankam, 2019). A functional paradigm, adopting a largely "techno-centric approach" (de Cozza et al. 2017, p. 609), considers users in terms of human *factors* (Bannon, 1991) and design technology for the generic user. In the case of older individuals, when this paradigm is adopted, technology is designed to compensate for stereotypical age-declining inabilities or deficiencies (de Cozza et al., 2017; Peine, 2019; Righi et al., 2017; Sayago, 2019). The sociotechnical paradigm, by contrast, views technology users as social *actors* (Righi et al., 2017; Sayago, 2019), who are able to regulate and coordinate their behaviour, act autonomously, and engage with technology casually or discretionarily (with a purpose) (Bannon, 1991; Peine, 2019; Sayago, 2019; Scharlach, 2009). This perspective assumes that technological and social systems are interlinked and that ICT use is shaped by sociocultural, historical and economic landscapes (de Cozza et al., 2017; Neves & Vetere, 2019; Tebes et al., 2014).

To design our customized age-inclusive and context-specific Yabelana ('sharing of information') ICT ecosystem to link users to service providers, we adopted a sociotechnical paradigm. Age-inclusiveness refers to age-integrated, multigenerational societies and communities (Annan, 1998; Kaplan et al., 2017). In an age-inclusive society, ICT users are treated, irrespective of age, as members of diverse learning communities in which some users are more advanced than others (Barker et al., 2019; de Cozza et al., 2017; Righi et al., 2017). From a technical perspective, age-inclusive technology means technology that is affordable and widely available (Scharlach, 2009) and promotes access to information, services and products for everyone (de Cozza et al., 2017; Righi et al., 2017; Scharlach, 2009). Context-sensitivity, however, acknowledges the situatedness of ICT users—in their sociocultural or historical environments, for example—and the importance for ICT uptake of the broader local conditions (Tebes et al., 2014; Trickett et al., 2011).

The drive to develop age-inclusive and context-specific ICT in our study is contextualized against global population ageing (see Chap. 1), as this technology holds great potential for promoting equal access to information, resources and services delivery. The chapter describes the design and introduction of the Yabelana ICT ecosystem, drawing on our earlier we-DELIVER community-based research project (see Chap. 3). Phase 1 contextualized older users' situatedness, and identified their needs and preferences in relation to cell phone technology as well as the social networks that facilitate their ICT use. Phase 2 consisted of the three-stage

development of the Yabelana ICT artefact. In Phase 3, the Yabelana app and USSD code were introduced to older users by student fieldworkers from the same cultural background, who adopted a user-centred approach and employed appropriate and supportive learning strategies. Phase 4 comprised the collection, analysis and reporting of student fieldworkers' reflections and older users' experiences, which yielded suggestions for improving Yabelana. Although the evaluation of Yabelana falls outside the scope of this chapter, the process we followed illustrates transferable principles in the development of technology for older persons.

## 8.2  Phase 1: Older ICT Users' Situatedness, Needs and Preferences, and Social Systems

The design of the ICT artefact in the we-DELIVER project, provided details about our target population of older South Africans against the backdrop of the country's sociopolitical history. It also considered their ICT needs and preferences in relation to cell phones, and about the social systems that mediated their cell phone use.

### 8.2.1  Contextualizing Older South African ICT Users

The sociotechnical paradigm that guided the development of Yabelana views all users as agents who exercise choice and action when using ICT (Neves & Vetere, 2019). Following Astell (2009, 2019) to enable us to respond appropriately to the ICT needs of older individuals, we launched the we-DELIVER research project to obtain baseline data about their cell phone use. The chronological age of 60 years and older was used as a marker because this is a significant life stage at which age South Africans qualify for a means-tested old age grant (see Chap. 1).

### 8.2.2  Older ICT Users in South Africa

Given South Africa's history and the economic legacy of apartheid, most older South Africans—a quarter of a century into the new democratic dispensation—still live in deprived conditions, suffer from chronic illnesses (including HIV and AIDS and their effects), and live with the consequences of younger people's migration to urban environments (see Chap. 1). Most depend on local government for their basic and service needs. Municipal service delivery, however, is frequently uncoordinated or age-inappropriate and, particularly in low-resourced rural settings, may be entirely lacking (Hoffman & Roos, 2021) (see Chap. 2). Understanding the situatedness of older ICT users, therefore, is relevant to ensure that any proposed technology is a

good fit, and that its acceptance and use promote age-inclusivity in practice. This view informed the user-centric development of the Yabelana technology artefact.

Three distinctly different communities were identified for the we-DELIVER project: a rural tribal community (Lokaleng) and two large towns (Ikageng and Potchefstroom) in the North West province, and a large town (Sharpeville) in the province of Gauteng (Department of Cooperative Governance and Traditional Affairs, 2016). Older individuals ($n = 302$) provided information about their ICT use as well as suggestions to improve the Yabelana ICT system. The findings are reported in Chap. 6, but older individuals' social situatedness and their interface with cell phone technology are discussed here. As many as three quarters of the older persons (75.8%) in the sample were members of multigenerational households, consisting of spouses, children, and grandchildren, with levels of living standards ranging from average to low. Those with low living standards were characterized by minimal access to services, water, or the means to buy labour-saving appliances (see Chaps. 2 and 6).

Older persons contributed their old age pensions to support the livelihoods of all the multigenerational households in our sample, as well as providing instrumental and physical support as carers of younger people or sick family members, as confirmed by a corpus of literature (Ogunmefun & Schatz, 2009; Schatz & Ogunmefun, 2007; Schatz & Seeley, 2015). In relation to cell phones, almost all the older persons (90.6%) in our sample had access to one or more working phones, and half (50.0%) had connectivity on a pay-as-you-go basis. Even though our cohort of older persons rated their knowledge and skills in using cell phone technology as average, about two thirds (69.3%) were able to use only the basic features (making and receiving calls or sending and receiving SMSs), mainly to contact their children or other family members. A large majority (77.2%) preferred older generation pushbutton phones because they thought smart phones were too complex.

### 8.2.3 Intergenerational Relations (a Facilitating Social System)

Nearly three-quarters of our cohort of older persons (71.2%) regularly asked for help with using cell phones from younger (related and unrelated) people they trusted, who were nearby, and whom they perceived as knowledgeable and having a positive attitude (see Chaps. 6 and 7). Despite the often strained dynamics around older persons' cell phone use, older persons still turned to younger people as proxy users even though the latter were sometimes perceived as impatient, disrespectful, or unwilling to help. Younger generations are therefore suggested as important stakeholders in the social system facilitating older persons' cell phone use.

Further key trends reported earlier in this book and relevant to the specific context and social conditions informed the design of the Yabelana technology artefact and are summarized in Box 8.1.

**Box 8.1 Key Trends in Older Users' Situatedness Informing the Design and Implementation of a Technology Artefact**
– The reality of poverty and limited financial resources (see Chaps. 1 and 6)
– Lack of social and healthcare infrastructure, service delivery and information about local services (see Chaps. 1 and 2)
– Social protection of older persons through means-tested old age grant (see Chap. 1)
– Migration and need to maintain contact (see Chaps. 1 and 6)
– Lack of education (see Chaps. 1 and 6)
– High acceptance of cell phone technology but skewed preference towards older generation (pushbutton) cell phones (see Chap. 6)
– Self-reported average knowledge and skills in using basic phone features but positive attitude towards cell phone use (see Chap. 6)
– Heavy reliance on intergenerational support for using basic cell phone features (see Chaps. 6 and 7)
– Strained intergenerational interactions in informal contexts in the private domain around older persons' cell phone use, potentially inhibiting older individuals' ICT use (see Chap. 7).

## 8.3   Phase 2: Technology Artefact: Name, Design, and Populate with Information

The design of the ICT artefact involved three stages: decide on a name and appropriate branding (Yabelana); design an ICT ecosystem consisting of a website, a mobile application (app), and an unstructured supplementary service data (USSD[1]) code; and populate Yabelana with context-specific service provider information.

### 8.3.1   Assign a Name to the ICT Artefact and Design Appropriate Branding

Initially, we considered giving the ICT artefact the same name as the community-based project, we-DELIVER. However, following consultations with the project steering committee (PSC) (two researchers, two student fieldworkers, an older individual familiar with the three communities, and an information systems expert),

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[1]USSD is communication protocol used by cell phones to communicate with a service provider's computer via text messages. This text-driven technology allows end users to interact using a menu selection system that operates in real-time.

**Table 8.1** Images considered for the ICT artefact logo

| Image | Appraisals of the image and text |
|---|---|
|  Image 1 | – The gendered presentation excludes older men<br>– It reinforces a stereotype that all older women carry water in containers on their heads<br>– Unclear association of image with sharing of information<br>– Text difficult to read |
|  Image 2 | – Reinforces stereotypes of older people associated with traditional customs (clay pots normally colourfully decorated to store water, Roos et al., 2010)<br>– Unclear association of image with sharing of information<br>– Text difficult to read |
|  Image 3 | Reinforces stereotypes of older people as passive recipients, dependent on the goodwill of others |
|  Image 4 | – Two same-sized hands represent equal participation across all ages in sharing and receiving information, and providing feedback<br>– Open hands symbolize safety and acceptance<br>– Asymmetrical composition and different colours represent diversity<br>– The colour purple-blue on the right disturbs the rhythm in the image<br>– Text difficult to read |

The initial logo design proofs used the name we-DELIVER.

it was concluded that using the same name for both artefact and project might create confusion. It was therefore decided to find a name that would reflect the information-sharing essence of the artefact. The PSC identified the term *yabelana*, which refers to 'sharing' in three of South Africa's 11 official languages: Sesotho (*abelana*), isiXhosa (*ukwabelana*), and isiZulu (*ukwabelana*) (L. Mathibela, personal communication, 23 January 2018).

Appropriate branding involved designing a logo that symbolized the artefact's meaning. Some images considered for this purpose, as well as their subjective appraisal by the PSC, are presented in Table 8.1. Image 4 in Table 8.1 was selected, following suggested revisions: to replace with black the purple-blue on the right of the image to provide a boundary for the logo; to accentuate the importance of contact when sharing and receiving information and providing feedback; and to make the text more readable. The final version is shown in Fig. 8.1.

**Fig. 8.1** The Yabelana logo
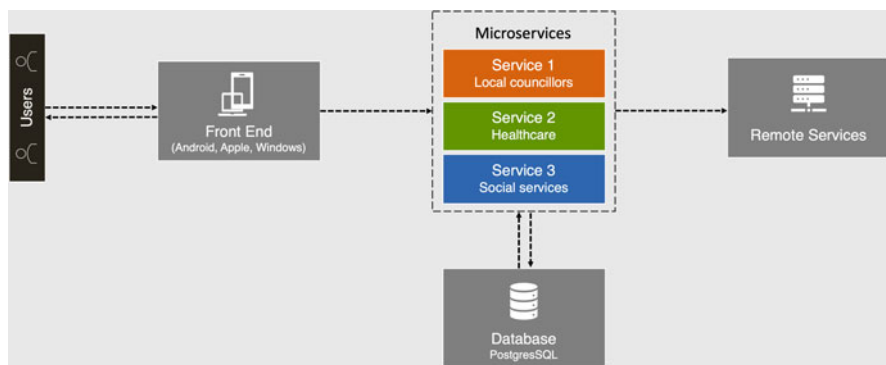




**Fig. 8.2** Application architecture diagram for Yabelana presents a high-level overview of the components and fundamental interactions within the system. End users interact with the different services via the front end interface. Upon requesting specific information, the query is returned from the database to display either on the front end or offer a one-way result via the remote services

## 8.3.2   Design ICT Ecosystem Consisting of a Website, App and USSD Code

In creating the Yabelana ecosystem, the ICT designer considered the interface with service providers and ICT users.

**From the Perspective of the ICT Designer** The ecosystem was created with the core of the system linking all the subsystems and interfacing with the mobile provider, mobile application, push notification providers, website, and the mobile provider for the SMS (short message service) and USSD code. An application architecture diagram (Fig. 8.2) depicts the interactions between the different components of the system, which result in providing the end user with multiple interface options such as a website, smartphone applications (for Android and iOS) including push notifications, and text-based messages.
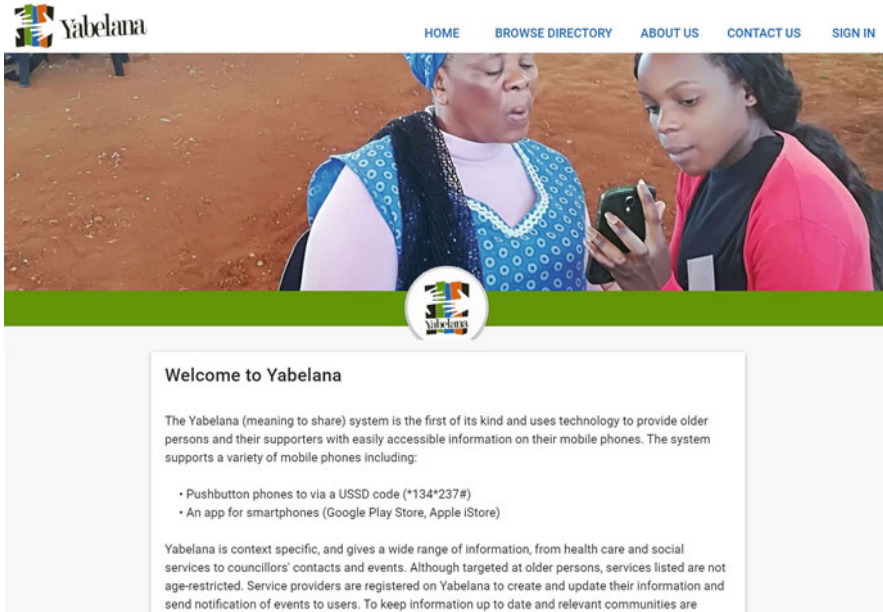
**Fig. 8.3** A screenshot of the website's landing page

End users who use older devices have the option of using USSD and SMS (reverse billed) notifications free of charge. The website (https://yabelana.org/) lists the services, resources, and events that are available in their local areas and accessible from any internet browser. The landing page (see Fig. 8.3) of the website provides a description of services and instructions on how to download and use the mobile app, and the USSD code. The user accesses the service and event directory by clicking on the Browse Directory tab. The service and event directory search starts with the user selecting a location. The user is then shown a list of service provider categories available within the selected location or a list of upcoming events for that location (see Fig. 8.4).

Informed by Eriksson and Sjölinder (2019), the design of the different end user interfaces adopted a user-driven perspective to ensure that the interfaces meet the needs of both service providers and (older) ICT users.

**Interface with Service Providers** A practical consideration and a guiding ecological principle informed the technology interface with service providers.

***Practical Consideration*** Service providers' registration and verification follow a distributed community approach. Community in this instance refers to the stakeholders (e.g. NGOs, practitioners, local municipality, social and health care) engaged in service provision for older persons. In practice, this means that
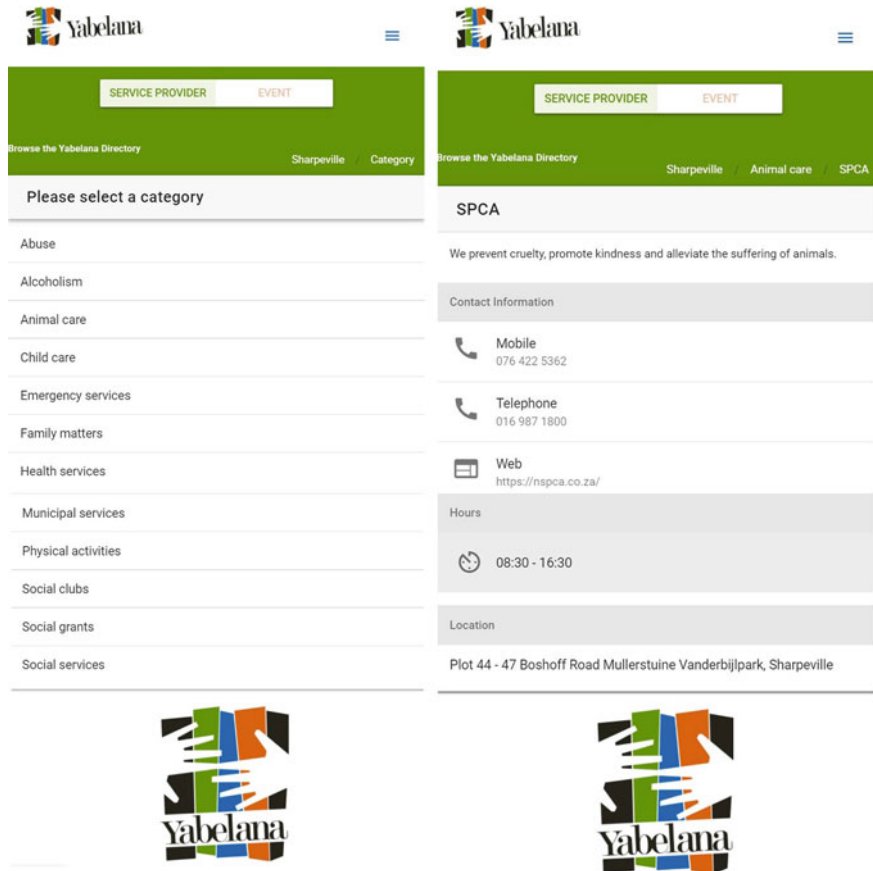
**Fig. 8.4** Screenshots of information about example service providers on the website

prospective service providers enter their information and the cell number of existing service providers. The existing service providers receive a SMS with the request to verify a new service provider. Once a prospective service provider have been authenticated, they receive a SMS confirming their registration. The new service provider subsequently populates the app with information related to the services or events offered (see Box 8.2). This approach for adding new service providers eliminates the need for central administration.

**Box 8.2  Service provider information relating to resources and services**
– The service name (full version and a condensed version for use in SMS
  and USSD)
– Location (city)
– GPS coordinates
– Provider's name
– Address
– Telephone number
– A service description in condensed version for use in SMS and USSD.

*Ecological Principle* The ecological principle of finding an optimal fit between older individuals and the environments in which they function (Keating et al., 2013; Tebes et al., 2014; Trickett et al., 2011) guided our decision to include information relevant to locations. In practice this means that service providers list services and events for each specific area in which they operate; if they have multiple offices, they create separate service provider information for the different precincts. A summary of the steps required to register as a service provider and to create information about services on the mobile application platform is presented in Fig. 8.5.

**Interface with (Older) ICT Users** The application in the Google Play store or Apple App store is downloaded by searching for Yabelana. The process of obtaining information about service providers and providing feedback on smart phones is presented in Fig. 8.6.

Older generation (pushbutton) phones access information using a USSD code. The USSD menus are delivered through an interface with an external service provider. To use the USSD, the user can dial *134*237# from any mobile phone. This is completely free of charge. The process is explained in Box 8.3 and in Fig. 8.7.

**Box 8.3 Users  access information using the USSD code**
– The user dials the number *134*237#
– A shortened version of the directory appears on-screen via USSD menus.
– The possible locations are displayed, to which the user replies to select one.
– The categories in the location are displayed. The user replies to select a
  category.
– The services are displayed, to which the user replies.
– The service details are displayed (condensed versions), to which the user
  could opt to have sent to them via SMS.
– A session cannot last longer than 3 minutes.

**Fig. 8.5** Steps that service providers need to follow to register and list their services on the Yabelana app



**Fig. 8.6** Process that the user follows to access information about service providers on a smartphone using the Yabelana app

**Welcome to Yabelana**
1. Ikageng
2. Lokaleng
3. Sebokeng
4. Promosa
5. Sharpeville
6. Buffalo City
7. Amathole
8. Alfred Nzo
9. Next

CANCEL | SEND

**Category select**
1. Health servi
2. Physical act
3. Social clubs
4. Social servi
5. Housing
6. Child care
7. Funerals
8. Family matte
9. Next
99. Back

CANCEL | SEND

**Health services**
1. Age-in-action
2. Ikageng Clinic
3. Potchefstroom Hospital
99. Back

CANCEL | SEND

**Ikageng**
1. Events
2. Services
99. Back

CANCEL | SEND

**Age-in-action**
1. Contact information
2. Description
3. Leave feedback
99. Back

CANCEL | SEND

**Age-in-action** 1
Tel:
0214264249
Address:
Contact
Mary Jane
0721019655
99. Back

CANCEL | SEND

**Age-in-action** 2
Champion the cause of older persons and service delivery
99. Back

CANCEL | SEND

**Age-in-action** 3
Please reply with your feedback.

CANCEL | SEND

**Fig. 8.7** Process that the user follows to access information about service providers, using USSD code

### 8.3.3   Populate the Yabelana Ecosystem with Service Provider Information

A multimethod approach was followed to identify services in the three communities.

1. Older persons' needs identified in the we-DELIVER project included: social security, medical, emergency, housing, safety and security, child care, electricity, sanitation, public transport, community centres and local economic development.
2. Interviews with NGOs involved with service delivery to older persons (e.g. Age-in-Action) identified services that were relevant but not limited to older individuals, such as child care, experience of abuse, and family matters.

In the pilot phase of populating the Yabelana ecosystem with information, we conducted a Google search to find service providers in the three communities, with descriptions of their services and contact details. We provided this information to the designers who populated the ICT ecosystem which we used to demonstrate the Yabelana app and USSD code to older individuals in the three communities (see Chap. 3).

## 8.4   Phase 3: Introduce Yabelana through Student Fieldworkers (as the Facilitating Social System)

The literature indicates that successful use of technology by older people is promoted not only through accessible technology and design but also through facilitated introduction (Neves & Vetere, 2019; Vaportzis et al., 2017). This insight underpinned our decision to invite student fieldworkers to participate in the we-DELIVER project. These young volunteers attended preparatory presentations on topics related to ageing both from international and local South African perspectives; community engagement (including interaction with older participants); conducting qualitative interviews; and completion of questionnaires using survey analytics on electronic devices (see Chap. 3). They then visited the three communities to collect data from the older participants about their cell phone use. After the data had been analysed and the Yabelana ICT ecosystem had been developed, the student fieldworkers visited the older individuals for a second time to introduce the Yabelana app and USSD code.

   To facilitate the introduction of Yabelana, the fieldworkers engaged with the older persons individually or in groups of three or four (see Figs. 8.8 and 8.9). Small groups provided opportunities for close interpersonal interaction, not only with the facilitators but also among the older individuals as they practised and used the technology artefact (see Barker et al., 2019). Introducing technology to older ICT users in small groups also promoted observational learning and the ability to ascertain the older users' technology acceptance (also see Sayago et al., 2019). Following their interactions with the older participants, the student fieldworkers

**Fig. 8.8** Student facilitator
introduce Yabelana to older
individuals





**Fig. 8.9** Student facilitator introduce Yabelana to older individuals

wrote reflective notes about their experiences, reported verbatim the older persons'
responses during the interaction, and suggested improvements to the Yabelana app
and USSD code. Their reflections were thematically analysed according to the
process recommended by Clarke and Braun (2013), and findings reported in Chap. 7.

Drawing on Roger's client-centred approach (Kunze, 2013; McCombs, 2013),
the student facilitators introduced the Yabelana app and USSD code in the commu-
nities after they had already created effective interpersonal relationships with the
older participants, at the time of their earlier data-collection visits (see Chap. 7). The
literature suggests that a facilitator's approach, when introducing technology to an
older user, plays an important part in its successful acceptance (Sayago et al., 2019).

The aim of the facilitation in our project was to promote acceptance and use of the
Yabelana app among our target population. To this end, the student fieldworkers
applied appropriate learning strategies (see also Chap. 3). One of these facilitators
made it clear that they needed to make sure of the users' ability to work with the
Yabelana themselves: "In my opinion, we should empower them [older persons] by
being able to use it [Yabelana] and not just make them aware that it is there or
quickly show how [it works]." To achieve their aim, many of the student
fieldworkers described having to introduce Yabelana to the older participants
"patiently and calmly" and "with compassion and empathy". The student
fieldworkers first created an optimal interpersonal context and learning space to
enable older individuals to verbalize their learning needs, as Kunze (2013) has
pointed out. Two student fieldworkers captured older participants' responses as
follows: "I just need you to show me where to press and what to do. That would
make me really happy" and "You know the problem seems to be I am unable to grasp
information immediately when someone teaches me. It takes me really long to finally
learn."

In the process they followed, the student fieldworkers started by observing what
the older individuals were able to do with their cell phones. They also observed the
specific needs of the older persons in using the technology and then they responded
appropriately. A student facilitator explained: "Each lady took her turn after I
finished and in this time I was able to identify obstacles unique to them." Such
observational knowledge informed the facilitation of the older individuals' ICT use.

Specific techniques for engaging with older users had been noted by McCombs
(2013): verbal explanations and experiential engagement, specific augmenting strat-
egies, repeating information, and using examples from real life. The reflections of
student fieldworkers in our study revealed how effectively these techniques had
worked in practice.

– *Verbal explanations and experiential engagement*. Every older person had a
  chance to practise the required skills after the student facilitators had explained
  the ICT application: "I gave each lady a chance, once I finished teaching her
  personally, to see if she could do it on her own."
– *Specific augmenting strategies*. The student facilitators supported the older par-
  ticipants' use of the artefact by introducing rhyming and rhythmic repetition of
  the steps to be followed: "While I was teaching her, I made up rhymes, like 'line,

number, line' for her to remember in which order to press the buttons, since this seemed to confuse her." Student facilitators and older persons also sang out the USSD code (*134*237#) to help them to memorize the information, which seemed to work well: "Now they know it and now I am glad." For the older persons who could read, student facilitators used written text. One explained: "I drew [a picture of the] buttons of the phone for her [an older woman] and wrote next to each of them what the purpose of pressing the buttons was." Another used prominent text only: "I wrote the USSD code on paper with bold and big letters for them to see" (see also Chap. 4). The student facilitators also used older individuals' hands as a means to concretize their memorization of the steps to access and use the technology:

> The thing is they cannot count. So they don't know which number is which or where to find it [on the cell phone]. So the solution I used was [to say] this is your right hand, the second button you press is to call, the next number is three. . .

– *Repeating information*. The young facilitators realized that some of the older participants needed the information to be repeated to enable them to learn and use it, because they seemed to "have difficulty in learning, memory or perception. Some of the information had to be repeated more than once for them to be able to understand."
– *Using real-life examples*. Learning was further supported when student facilitators used examples from everyday life to explain how the ICT app functions and what benefits it could bring. Two facilitators explained how they had engaged directly with issues the older persons raised. One reflected: "They started telling me about the problems they have in the village. That made it easy for me to explain how the [Yabelana] app works and how it will help them in finding solutions to their community problems." Another gave a service delivery example: "Most of them struggled with housing and water and electricity. So I showed them how they can easily get the contacts of relevant people concerning houses, and water and electricity."

A more optimal facilitating social system seemingly manifested in the relationship between older persons and student fieldworkers (unrelated younger people). Older persons experienced receiving supportive assistance from student fieldworkers who accommodated their learning and age-specific needs, were willing to repeat instructions, and showed respect to their elders at all times (see Chap. 7).

## 8.5 Phase 4: Improve the Yabelana App and USSD Code

In this phase, student fieldworkers' reflections and older users' responses were collected, including recommendations for improving their use of Yabelana (app and USSD code).

### 8.5.1  Reflections of Student Fieldworkers and Older Individuals

The student fieldworkers ($n = 135$) wrote down their reflections after interacting with the older participants, and included at least three verbatim responses from the older individuals during the interactions (see Chap. 7, Box 7.2 for the guiding prompts used). The reflections of the student fieldworkers and the verbatim responses from the older participants were anonymized, uploaded on ATLAS.ti 8, and subjected to thematic analysis (see Clarke & Braun, 2013). A coder and co-coder analysed the data using a coding system and code book (Morse, 2015). The prolonged engagement in the research process enhanced the trustworthiness of the findings (see Shenton, 2004).

Two themes emerged: older individuals' independent cell phone use, and enabling technology to access services.

**Independent Use of Cell Phones** Older individuals were pleased to be able to use Yabelana to access information on their cell phones, particularly when they could do so without having to get help from younger relatives. A student fieldworker reported: "The older persons were so happy that they can do it themselves. Because when the older people want to access their phone, they normally call the young ones. So they were happy that they can do it without them." The older participants were also pleased that they could access relevant information on older generation phones. A fieldworker reported the response of one of the older women: "She's happy about it. She can get the information using the phone that is not smart."

**Enabling Technology to Access Services** An older user confirmed that technology had enabled her access to services and service providers: "Now I will be able to talk to the municipality people because I have been wanting to talk to them for a long time." Another noted: "The app helped me to contact the ambulance because I had no contact with the ambulance and I'm also struggling with contacts of health services which are nearer to Lokaleng."

Technology such as Yabelana is designed to promote affordable access to service delivery by older individuals if financial resources are limited. Reversed billing, for example, can enable older individuals to access services or information without having to spend money. Two student fieldworkers reflected as follows on the economic benefits to the older participants: "They were happy that they can get access without using airtime" and "The app is cost effective because the older persons won't have to travel a long distance and spend a lot of money to go the municipalities or the clinics or the hospitals to lay their complaints. They'll just call."

**Table 8.2** Recommendations to improve Yabelana (app and USSD code)

| Yabelana app | USSD code |
|---|---|
| Use a toll-free number for users to call, with options from an automated voice response (in a language of their choice) | Extend the time available for interacting with options on USSD (e.g. extend 'time-out' time) |
| Keep the options on the app limited to as few as possible for easy navigation | Enlarge the font of the characters on the USSD menu |
| Use visual images to illustrate the different categories available on the app | |
| Add an option that allows for instant dialling of the number from the app (rather than the user having to write it down) | |
| Recommendations applicable to the app and USSD code | |
| Include functionality to purchase water, electricity, and airtime from the app and USSD code | |
| Present the list of information about services in all the official languages, or include English plus at least one additional language | |
| Offer more time to complete tasks to obtain relevant information | |

### 8.5.2 Recommendations to Improve the Use of Yabelana (App and USSD Code)

Recommendations suggested by student fieldworkers and older users to improve the use of the Yabelana app and USSD code are listed in Table 8.2. The recommendations included specific accommodation of the older technology users' skills and abilities, revisions to the technology interface to promote visibility, and built-in functionalities to enhance usability.

## 8.6    Conclusion

This chapter illustrates the fact that, informed by a sociotechnical paradigm, technology developed by employing a bottom-up approach is highly appropriate to accommodate older users' actual diverse needs, preferences, and technology usage. In our study, facilitation of the older individuals' ICT use succeeded through the application of a client-centred approach, incorporating optimal interpersonal relationships in which compassionate facilitators offered the older individuals customized personal support.

The design of technology within this paradigm, however, provides no quick fix to improve older individuals' access to or use of technology. Our cohort of older ICT users clearly indicated that their use of ICT depended on repeated facilitation by younger people who were willing, able, and supportive, but which, unfortunately, was not always easily or productively available when they needed it most (see Chap. 7). Furthermore, introducing technology that has been developed using a sociotechnical approach does not guarantee uptake from government, social, or

health service providers. To encourage the level of interaction needed, Yabelana adopted a distributed community approach in which stakeholders and service providers became collaboratively accountable and responsible for ensuring that useful and updated information is available. The contribution that this chapter offers is its illustration of the way in which a grounded and generational approach can work in practice, and its demonstration of a process to inform technology design for all.

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# Part III
# Age-Inclusive ICT Design and Further Developments

# Chapter 9
# Inclusion of Marginalized Older Individuals in Artefact Design: Reflections and Recommendations

Check for updates

**Vera Roos and J. T. Janse van Rensburg**

**Abstract**  It has become clear that technology will increasingly be used by older individuals as well as in caring for them, yet older end-users are often excluded from artefact design. Including them in the design process can support their (often hesitant) uptake of technology. This chapter illustrates the participation of a cohort of marginalized older individuals in the development of our Yabelana ICT ecosystem (a website, a mobile application, and an Unstructured Supplementary Service Data (USSD) code), which gives access to information about local services. We drew on design science research principles and applied six types of problem-solving actions to develop our artefact: (1) describe the problem; (2) define the problem; (3) relate to key people about the problem; (4) generate an action plan; (5) act to alleviate the problem; and (6) evaluate the effectiveness of the action. Against the background of the relevant literature, we give an account of the processes applied to facilitate the participation of our intended end-users. We critique the actions taken to involve our cohort, and conclude with recommendations for promoting older individuals' inclusion in the design of technology artefacts intended for their use.

**Keywords**  Marginalized · Older technology users · Artefact design · Technology · Yabelana artefact

## 9.1  Introduction

Technology is set to play an increasingly important role in the lives of older persons, yet technology designs for finding innovative solutions for their real, lived problems are often conceived and developed without their input. This could be the consequence of designing generic artefact solutions for a wide range of users (adopting a functional paradigm) (de Cozza et al., 2017), or for general use across multiple situations (Venable, 2009), or when target groups of users with specific needs (such

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as older individuals) are hard to reach (Gibson et al., 2019). We approached the design of a technology artefact on the assumption that older persons are able to participate in the design of such artefacts (Franz et al., 2019). We hold, moreover, that if they are sufficiently included in artefact design and if their interests are addressed, the artefact will be useful to them and they will be more likely to accept it. We also assumed that, with rapid technological evolution, some form of digital divide will always be an issue (Francis et al., 2019) and that, to include older technology users, we needed to find innovative solutions. To this end, we followed the suggestion of Kelly and Westoby (2018) to adopt a both/and logic, on the one hand acknowledged the complexity of involving older end-users of technology in the design and development of a technology artefact, and on the other hand delivering a rigorous technology product as emphasized by Janse van Rensburg and Goede (2019).

This chapter reflects on the process of artefact development and suggests ways to involve older end-users. The discussion is organized around six types of behaviour associated with the purposeful sequence of actions to reach a desired outcome (convergent problem solving), as outlined by Kelly and Westoby (2018): (1) describe the problem; (2) define the problem; (3) relate to key people about the problem; (4) generate an action plan; (5) act to alleviate the problem; and (6) evaluate the effectiveness of the action. In our case, actions were directed towards the development of a technology artefact. To avoid repeating information, and because we draw here on content presented earlier in this book, we refer to relevant chapters for further details.

In the design and development of our technology artefact, the point of departure was that older individuals should participate in the design of the technology artefact (see also Smith et al., 2019). Participation of this kind is normally informed by the end-user's accessibility, acceptance of technology, and competence to, in addition to an interest in playing a role in the artefact's design. However, participation faces challenges when older end-users have limited competence in using the technology, and are expected to "know what they want, what the alternatives are, and have the strength and the resources to give voice to it and take the initiative" (Kelly & Westoby, 2018, p. 70). We found ourselves facing a dilemma: on the one hand we wanted to involve a cohort of older end-users with limited technology competence, and on the other hand we wanted to apply a process rigorous enough to develop a sustainable artefact with long-term use. We decided to deal with this tension by adopting a both/and approach. In the section that follows, we describe the processes to facilitate the participation of a cohort of marginalized older persons in the design and development of our technology artefact through the application of six sets of actions. These actions touch to some extent on elements of design science research (DSR) used in designing and developing technology artefacts.

## 9.2 Six Actions to Design a Technology Artefact

We start with a series of six convergent problem solving actions, as presented in the literature and as we applied them in our study in the context of the age-inclusive technological needs of our participants.

### 9.2.1 Describe the Problem

Technology solutions can be effective only if they "emerge from an accurate and sensitive reading of a situation" (Westoby & Botes, 2020, p. 82). The design of a technology artefact is normally informed by an awareness of the problem. From a DSR perspective, Gregor and Hevner (2013) refer to the need to understand not only what is required by the end-user but also the real-world technological area of concern and the solution that the technology needs to offer. We discuss briefly the problem that gave rise to the need for a technology artefact.

Population ageing and the ever-growing numbers of older people who require care and services are cause for concern, given the worldwide prospect of insufficient resources to address their needs (see Chap. 1). There is general agreement that technology can help to improve access to information, social connectedness, and social and civic participation (Neves & Vetere, 2019). However, the problem is that language, socio-economic differences, and historical and current conditions present challenges for older individuals' access to information and services, particularly in the developing world and, in our case, specifically in South Africa.

Most older South Africans live in multigenerational families whose members share resources, including cell phones and the older persons' state-funded pensions (see Chaps. 1 and 6). The significant uptake of technology by older South Africans presents underexplored opportunities to design technology artefacts that could, for example, offer them an *e*Directory that provides up-to-date relevant information about local services. Such an artefact would also optimize the use and distribution of resources and help to improve municipal service delivery (see Chap. 2). If older users were to accept and use it, the artefact could provide further information and communication technology (ICT) interventions to address their needs and thus promote their health and well-being.

### 9.2.2 Define the Problem

The creation of an artefact requires a clearly defined problem or issue that needs to be addressed, and a solution that can potentially address the problem (Peffers et al. 2008; Peine, 2019). The problem statement should focus not only on the problem but also on the complexity that surrounds it (Hevner et al., 2004). A technology designer

needs detailed information to show how the proposed technology solution are relevant to older persons, organizations, and the context for which the solution is to be designed. Therefore, in-depth understanding is required of the older end-users and their specific contexts and of what would constitute the most appropriate and relevant technology artefact.

To this end, we launched two data-collection initiatives to obtain baseline data about older individuals' cell phone use and the social systems facilitating their use of technology, as well as the types of information about local services the older individuals would need to access. The questionnaire development and data-collection processes are discussed in detail in Chaps. 3 and 5 and the results are reported in Chap. 6.

### 9.2.3  Relate to Key People about the Problem

We identified three types of key people who would be needed to research and address the problem: a transdisciplinary team, a project steering committee (PSC), and a technology designer.

The need to cross disciplinary boundaries and to draw on different analytical boundaries (Kincheloe, 2001) informed the selection of a transdisciplinary research team. Experts from different disciplines provide multiple views and new ways of looking at a problem. In a transdisciplinary discussion about the development of a suitable artefact, experts compare methods, and from different social and theoretical assumptions they offer multiple perspectives. For these perspectives to be applied in developing a solution, they should be shaped into a shared reality (see Kelly & Westoby, 2018). Our community-based data-collection involved a transdisciplinary team who consisted of experts in law, public administration, demography and population studies, development studies, social work, psychology, language studies, biokinetics, information systems, and socio-gerontology. The socio-gerontologists—who focus on issues affecting the lives of older individuals by means of dedicated research projects or as practitioners—offered three primary resources: (1) conceptualization of the data-collection and the nature of the involvement of older adults in the study sites; (2) adoption of the role of "mediating the communications between technology designers and end-users" because they were familiar with the needs and situatedness of older end-users (Kanstrup & Bygholm, 2019 p. 30); and (3) through their group work expertise, facilitation of transdisciplinary collaboration towards a process of collective discovery (Kelly & Westoby, 2018).

The PSC was created to act as adviser for the research team to guide context-relevant and culturally sensitive behaviour and to oversee project implementation (see Theron, 2013). The PSC comprised two socio-gerontologists, two student fieldworkers, an older individual from one of the participating communities, and an information systems expert. The PSC oversaw project implementation, guided context-sensitive interactions with older participants, and facilitated the inclusion of older individuals.

Finally, a suitable professional technology designer was identified to apply various approaches to developing the ICT system required within the boundaries of end-user preferences and contextual realities; this role can involve research-based development methods such as DSR, and architectural frameworks such as the TOGAF architecture development model (Hevner, 2007; Tristiyanto & Kurniawan, 2017). We identified technology designers who could develop an artefact based on the findings of the baseline data collected from a cohort of older participants about their cell phone use and design specifications formulated by the PSC.

### 9.2.4  Generate an Action Plan

We engaged in specific research actions to make "the voices of marginalized groups heard by identifying and creating evidence of those who are rendered invisible" (Keating et al., 2021, p. 61), and to provide the designers with specific information, relevant to older end-users, prepared in a format that would inform the design processes (Peine, 2019). Research informs the design of technology artefacts (Hevner & Chatterjee, 2010; Orlikowski & Lacono, 2000; Vaishnavi et al., 2004/2019), and can take the form of a needs assessment, which presents evidence of the problem, issue, gap, or concern for which an artefact solution is sought (Gupta, 2011). Such a needs assessment typically: (1) determines the needs of the target audience (older individuals in our case) in order to develop appropriate technology solutions that are fit for purpose; (2) assesses the attitudes of the target audience towards technology; and (3) serves as a baseline to measure and evaluate the impact of the intervention (Peine, 2019; Tegart, 2019). It follows that, in designing the artefact, the people for whom it is intended should be taken into consideration in every aspect, to avoid a generic and unspecific outcome with limited applicability to (in our case, older) end-users (Dix, 2017). The literature confirms that if human factors such as cultural practices, social interactions, and human behaviour are not considered, the artefact has little relevance and use, apart from attracting academic scrutiny (Dix, 2017).

We involved targeted marginalized older end-users by conducting a needs assessment of their cell phone use and specific needs. Recognizing that they would require support in providing the required information, we trained student fieldworkers to facilitate the process through social engagement strategies, and to use technology to capture data as the participants provided it. In this way, the data-collection itself became a demonstration of technology use.

### 9.2.5  Act to Alleviate the Problem

Here we discuss our gap analysis, based on the findings of the needs assessment, and the conceptual design of the solution.

#### 9.2.5.1 Gap Analysis

A gap analysis is used to understand the value of a potential solution by reflecting on the current system and comparing it with what a new solution might offer (Marra et al., 2018). A gap analysis includes mapping the assets and resources as well as the deficits of a particular user group in a specific context. An assets perspective includes identifying strategies, capabilities, processes, or technologies that could be used, or, if these are underperforming, examining how they could be revised to meet the goals of a planned intervention, while a deficit perspective focuses on whether or not end-users could be supported by the proposed artefact (Winch et al., 1998). Our gap analysis was performed from an asset as well as a deficit perspective.

From an asset perspective, several elements were noted.

- There was significant access to cell phones even though they were mostly older pushbutton versions (see Chap. 6).
- Older end-users used basic functions on cell phone devices, which could be optimized by incorporating similar functionalities into the newly designed artefact (see Chap. 8). For example, older persons were able to upload airtime on their cell phones. Similar steps could therefore be included, for example, for using the unstructured supplementary service data (USSD) code to access information.
- Younger unrelated people (without a relational history) were able to support older persons' use of technology and their access to information effectively (see Chap. 7).
- Older end-users' social networks could facilitate their competence in using technology.
- When older individuals were supported effectively, they could use cell phones independently (see Chap. 8).
- Regarding the optimization of resources, the artefact would be able to save older individuals time and money if they were able to use it to access updated service information or to provide feedback about service provision.

From a deficit perspective, we noted the following issues.

- Older individuals obtained information by physically visiting service providers, which requires financial resources.
- Older individuals depended on their close social networks to access relevant information using the facilitation of younger people. The relational dynamics between older and younger people were sometimes ineffective, particularly in informal interpersonal contexts in the private domain, and this could potentially compromise end-user access to information (see Chap. 7).

The findings of the needs assessment were broken down into definable requirements to inform the design of the artefact. A list of the design requirements was derived from the baseline data and included the following:

- Technology should be available on different digital platforms;
- The design must accommodate pushbutton as well as smartphones; and

– The system should be self-sustainable to suit conditions where financial resources are limited.

### 9.2.5.2  Conceptual Design

Conceptual designs typically result from information sessions that form part of a participatory design approach. This approach includes non-designers (e.g. the target user group as well as subject matter experts) in the design of an artefact (Sanders et al., 2010). Including the target users as part of a participatory design approach improves the likelihood of a successful development outcome (Ngqoyiyana et al., 2020; Smith et al., 2019).

The functional requirements of an artefact are normally depicted by conceptual designs. These "are often conceived by brainstorming workshops with users and stakeholders to generate ideas" (Anvari et al., 2019, p. 63). Creating a conceptual design for an artefact is a key step in the development process for two reasons, according to Ngqoyiyana et al. (2020): first, it validates accurate understanding of the requirements (as stipulated by the target user); and second, it provides the developers with a reference document of what the artefact should resemble and the key functionality it should provide. Validation is normally achieved by talking to representatives from the target user group, compiling data on the requirements, creating a visual representation of the requirements (mood boards, storyboards, and wireframes), and demonstrating the conceptual design to the target group to determine whether their requirements were correctly understood (Wong et al., 2012). It is an iterative process and concludes when the target users are satisfied that the conceptual design addresses their needs.

The conceptual design for the development of a technology artefact for our purpose was achieved by unidirectional translation processes involving the technology designers and the PSC. The process unfolded as follows: during a brainstorming session, artefact designers and the PSC discussed the proposed technology artefact. This interaction informed the compilation of a software proposal document by the designers and the development of a cell phone application prototype. When it was ready, the designers demonstrated the prototype of the artefact to the PSC.

Chap. 8 presents a comprehensive discussion of the phases followed in our project to develop the technology artefact—it consisted of the Yabelana ICT ecosystem, with a website, a mobile application and a USSD code. The specifications of the artefact were limited to suit the type of cell phone technology with which our older end-users were familiar (pushbutton and smartphones), the purpose of the technology (to promote access to service and service information in their particular context); and the fact that the system had to be self-sustainable. On completion of the iterative development process, the application was submitted to Apple and Google and uploaded to the relevant application stores as a free resource. The artefact was released in the following ways:

– To older individuals in the communities where data about their cell phone use had
  originally been collected (see Chap. 4);
– Through workshops with local government officials, and with representatives of
  Age-in-Action, the biggest NGO involved in promoting the interests of older
  individuals in South Africa (see Chap. 3); and
– In a policy brief developed for the Department of Public Service and Adminis-
  tration (see Chap. 3).

### 9.2.6   Evaluate the Effectiveness of the Action

Many options are available for evaluating technology artefacts. Most methods
involve internal checks by the developer, expert reviews, and field tests (Peffers
et al., 2012). Artefact evaluation normally starts with self-evaluation by the devel-
oper, who reviews it for apparent errors. Next, evaluation should include expert
reviews and a one-on-one session with a target user or small groups of participants
(which could take the form of a case study) (Gregor & Hevner, 2013).

Our artefact was first evaluated by the PSC, which suggested several improve-
ments. Next, we involved older individuals and asked them for qualitative feedback
in informal small group interviews, facilitated by younger people (student
fieldworkers) (See Chap. 4). The student fieldworkers, who adopted a user-centred
approach, facilitated the use of the artefact by applying various supportive strategies,
starting with building safe connections. The older individuals made recommenda-
tions for improving the use of the artefact, but the designers were not able to address
all the points arising in the feedback—for example, the suggestion to include more
language options on the USSD code, or longer item descriptions—because of the
limitations of the type of cell phone technology available.

## 9.3   Including Older Individuals in Technology Artefact
##         Design: A Critique

The processes presented in this chapter captured the first attempt to include a cohort
of marginalized older South Africans actively and deliberately in the design and
development of a technology artefact. The difficulties were extraordinary: this group
of end-users not only presented with low competence in cell phone use and low
literacy levels, they also had limited financial resources, a preference for older
pushbutton phones, and they depended on younger people to use their cell phones;
relational dynamics around the cell phones sometimes compromised older individ-
uals' full and optimal use of cell phones. We took seriously the positioning of people
towards engaging with technology, informed by Kelly and Westoby's idea (2018)
that "people generally do what they can with what they have" (p. 95). To support

older participants' inclusion in the design of an artefact, we involved trained younger student fieldworkers with similar sociocultural knowledge to engage with the older participants around technology by relating and interacting authentically. We capitalized on older participants' eagerness to learn by involving them in the design of our technology artefact to promote their access to services and to solve real-life problems.

We approached the technology design mindfully aware to refrain from "design paternalism", drawing on Peine (2019, p. 57), and were able to find novel ways to collect the baseline information from the intended older end-users. The data from our baseline study were critical for the development of the artefact, but direct contact with the older end-user would have been of additional assistance had we been able to involve them further, by way of an iterative process, as the technology artefact itself was being refined. In this instance, the conceptual design phase ideally offers multiple opportunities for designers to present different versions of the interface to the intended (older) end-users and allow them to select the options that appeal to them most. However, despite the fact that our end-users were offered the opportunity to comment on the final product only once because of time limitations, the revisions they suggested could nevertheless be incorporated into the further development of the technology artefact.

The involvement of the PSC in our project was crucial: its members provided important background information in terms of older end-users' situatedness, indicated the most needed care and service needs of older persons, suggested appropriate ways to involve participants with technology, and served as translators of the technical designer processes between end-users and designers, which enabled the project to achieve a technology artefact suitable to promote older individuals' access to information on cell phone devices. However, we found that we had over-estimated the extent to which a PSC was able to anticipate all the technology-related experiences of the older individuals in the communities selected for our project. In a future phase of Yabelana development, we plan to engage community leaders in further updates and improvements. We are aware that the impact of adopting technology depends not only on subjective experience but also on word-of-mouth among older individuals in their communities. If one or two trusted community leaders adopt and promote the use of the new technology, the likelihood is greater that its uptake will spread more readily to the rest of the community.

## 9.4   Recommendations

We present recommendations to support the inclusion of marginalized older individuals in technology artefact design from four perspectives: broader-contextual, local, relational, and technology design.

The inclusion of a cohort of marginalized older individuals requires a broader understanding of the changing population demography—on a global scale as well as how it emerges in a developing world context such as South Africa. The broader

contextual understanding informs the need to find solutions creatively to include older individuals and to promote their access to health and social services against the reality of decreasing resources and their exclusion as a priority group.

In order to develop a technology artefact likely to be used in local contexts, gather knowledge about the specific target group's sociocultural situatedness, and in relation to mobile devices, their preferences and perceived competence to use technology, and identify any facilitators who are supporting the end-users' with cell phone use. This knowledge can be obtained from the literature, transdisciplinary expert opinions, and results of relevant research undertaken. The key message here is to present specific knowledge so that designers are able to develop an artefact suited to address the specific aim for which the solution is required. Socio-gerontologists or gerontechnologists can further support the inclusion of marginalized older end-users by facilitating unidirectional translational processes between end-users and designers.

Include older technology users through social engagement facilitation strategies in the design and use of technology artefacts. Trained younger people who are familiar with the sociocultural norms and customs can support older end-users' adoption and use of technology more optimally. Uptake of this particular cohort of end-users can also be supported when an older individual in the local context champion the use and adoption of the technology.

Technical designers can support the inclusion of marginalized older end-users by using digital actions closely related to what the end-users are familiar with. Drawing on users' existing knowledge of using technology can further support the uptake of new technology. Involving people in multiple methods of feedback or evaluation platforms will contribute to presenting a usable and refined technology artefact— thereby supporting the inclusion of the target group of technology users. When facilitators are involved to introduce the technology artefact, a good practice is to ensure that they have sufficient knowledge of the technology to explain the limitations of the artefact and to manage the expectations of the affected target users.

Recommendations to promote marginalized older individuals' inclusion in technology artefact design are summarized in Box 9.1.

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**Box 9.1. Recommendations to Promote Marginalized Older End-Users' Inclusion in Technology Artefact Design**
– Ensure a broader contextual understanding of the complexity around the inclusion of older individuals in technology.
– Know the guiding international and national frameworks (e.g. legislative).
– Present evidence related to the technology and service needs of older individuals in a particular context as specifically as possible. It could include access gaps related to material, skills in using cell phones, cell phone use, and competence (knowledge, skills, and attitude) (Francis et al., 2019).

**Box 9.1** (continued)

- Promote unidirectional translational processes between end-users and designers in accessible terms but with concrete implications for the artefact design.
- Determine existing knowledge of older end-users to enable inclusion of design elements with similar functionalities so as to encourage user acceptance.
- Establish an optimal relational space before introducing technology.
- Introduce the technology artefact in an acceptable sociocultural manner and through facilitation for example, by trained younger people.
- Use social engagement strategies to support older end-users' use of technology.
- Identify a member of the affected target group to champion the adoption of the technology artefact.

**Recommendations for Designers to Include Marginalized Older End-Users in Technology Design**

- Present options for older individuals to consider that are close to their existing frames of technology reference.
- Involve older technology users in as many evaluation platforms a possible, such as expert evaluation, subject-based experiments, prototyping, action research, and illustrative scenarios to demonstrate an artefact's utility (Hevner et al., 2004).
- Ensure that facilitators of the evaluation of the technology artefact have sufficient technical knowledge of the technology context to inform the older end-users of its limitations of the artefact and to manage the expectations of the affected target users.

## 9.5   An Open Ending

Rapidly evolving technologies present challenges associated with digital divides and inequalities, but also offer many opportunities for improving quality of life, and for promoting participation in society by marginalized groups, including older persons. Finding innovative technology solutions to satisfy a variety of needs should, therefore, not be limited to designing relevant artefacts; the process should also involve end-users' active participation so that the technology becomes accepted as part of everyday life, especially by those who are hardest to reach and engage.

This chapter explains how our project moved beyond a problem of not knowing enough about older individuals' cell phone use to obtaining accurate baseline data so that an appropriate technology artefact could be created to give them access to relevant and up-to-date information about local services. We made a point of listening carefully, and with empathy, to a cohort of marginalized older persons;

by gaining their trust and confidence, and without manipulation, we facilitated their inclusion in the design and development of an artefact customized to their needs. We obtained information from the older end-users about the problems for which technological solutions were sought and translated it into doable design requirements. The result succeeded in satisfying the immediate needs of this community-based project. The process that it followed brings further benefits for other projects that attempt to create innovative technological solutions for assisting vulnerable or marginalized people who are left behind, because it demonstrates methods that they too can employ to involve such communities actively and productively in developing solutions that will genuinely work for them.

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# Chapter 10
# Digital Divide and Digital Inclusion: Juxtaposed Realities and *e*Inclusive Prospects for Older Persons

**Jaco Hoffman and Vera Roos**

**Abstract** The digital divide within and across generations is often explained by older persons' exclusion from, or limited access to technologies, as well as reluctant uptake on their part. However, given the interdependencies between young and old in the developing world, cell phones offer potential for people to connect across and within generations. This chapter considers the body of main transferable themes emerging from the present study in terms of *e*Inclusion of older persons beyond the temporal and particular. We highlight in particular the value of taking an intergenerational approach; utilizing the intergenerational contact zones (IZCs) generated around and through the cell phone; using planned intergenerational programming (IP) for *e*Inclusion; and older-user-centric participation in any development and implementation of technologies. The bottom line to aim for is a person-relevant and technology/environment fit to enhance the lives of all older adults and to benefit society as a whole.

**Keywords** Ageing · Developing world · Digital divide · Digital inclusion · Intergenerational programming · Mobile technology · South Africa

## 10.1 Introduction

Global population ageing is one of the megatrends of the twenty-first century. In Africa—still characterized by its youthfulness—the increase in numbers of older people intersects with another post-millennium megatrend: the immense speed of developments in ICT, its uptake, and the technology-induced transformation of

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everyday life across the continent. These two intersecting trends underscore issues of access to ICT of older persons in relation to the generational digital divide. This divide relates partly to older adults' adoption of technologies based on structural factors *within* the cohorts/generations of older persons (Fang et al., 2019); those who, for example, have more resources and a better educational background, are more likely to use technologies that enhance their access and connectedness to their families and communities. Gender differences complicate these patterns. The digital divide also involves a perpetual fault line *across* generations, with older generations relentlessly perceived as naïve digital migrants and younger generations as savvy digital natives. This dichotomy is not just over-simplistic but downright ageist and begs to be problematized.

## 10.2   Problematizing the Ageing–Technology Interface

Where population ageing is often seen as a major "societal challenge" (Cuijpers & van Lente, 2015, p. 54), technological solutions based on innovation are regarded as a useful (and by some the ultimate) modus through which such challenges can at least partly be addressed (Silver & Johnson, 2018; Silver et al., 2019). However, doubts remain about whether technologies actually fulfil older users' needs and wishes and whether technologies developed specifically for older users necessarily protect and consider key ethical values. Empirical evidence suggests that the development and use of technologies for older persons is not as rosy as intended in terms of unredeemed returns on investment and the often unintended consequences of, or unexpected responses to such technologies (Fernández-Ardèvol, 2016; Golant, 2017; Nierling & Domínguez-Rué, 2016; Tomlinson et al., 2013). The complex relationship between the ageing individual and technology was already pointed out at the turn of the century by Charness et al. (2001) in terms of the prospective benefits and the potential risks and challenges of such interaction. More recent academic work (Felsted & Wright, 2014; Fingerman et al., 2020; Peine et al., 2015) has likewise pointed to the need to shift the focus from the technological to the human aspects of ICT development, that is, to understand the co-construction of the phenomenon of ageing and the role of technology, and to support the inclusion of older adults in the process.

The realistic and sensitive inclusion of older persons in technology (*e*Inclusion) is an imperative—specifically in developing world contexts where resources are limited. Mobile connectivity potentially provides older adults with access to important social, emotional, and tangible resources, such as, for example, those that provide life-enhancing environments, including education, health, service delivery and financial inclusion (Silver & Johnson, 2018). Yet older adults' technology use remains complicated in terms of pervasive generational and cohort effects that underpin digital divides—anticipated to continue as new and updated technologies are introduced, and to persist and be perpetuated between generations, even as older cohorts become more digitally advanced.

We draw, for the rest of this discussion, on our community-based project during which we gathered data to develop a technology artefact in support of older South Africans' access to information about municipal services. Our findings drew attention to transferable pointers of potential use for planning and implementing future ICT projects in the developing world and beyond.

## 10.3   Transferable Knowledge for *e*Inclusion of Older Persons

We outline several findings from our research that specifically relate to older cell phone users, then we discuss broader themes related to intergenerational *e*Inclusion. The list of findings serves the purpose of a summary, essentially recapping the core story of the Yabelana artefact.

– Older people (across socio-economic categories) who were not able to use their cell phones optimally were, on the whole, keen to learn how to use the functions offered by their mobile devices. To this end they were open to learn and accept help from younger generations, provided it was offered respectfully, with due regard for their dignity;
– Older individuals made use of their cell phones to access services, but used them mostly to manage and maintain relationships. The instrument was for them a means to an end and did not have intrinsic meaning as a technological device;
– While older adults acknowledged their digital dependencies as a major drawback, they maintained their autonomy and agency as owners of their devices, and did so partly by using their networks as a secretariat or web of proxies in order to navigate the support they needed. Autonomy did not necessarily exclude interdependence, and interdependence did not mean the surrender of autonomy.

This outline of basic findings about cell phone use by older persons in our South African research communities frames several themes, described below, that guided the development of our Yabelana technology and that offer a foundation for similar community-based ICT solutions to benefit older generations.

### 10.3.1   *Intergenerational Approach*

A major insight—easy to exaggerate but complicated to understand—across the course of this volume pertains to the seemingly unlikely potential that the digital divide offers for intergenerational digital inclusion; when a divide becomes an opportunity; when dependencies across the divide become interdependencies. The (South) African context—where most households are multigenerational with different age cohorts living in close proximity to one another, and where the cell phone

mediates the space—provides for an intra/intergenerational contact zone (ICZ). The mutual dependencies in these households further enhances intergenerationality: younger (often unemployed) age groups look for subsistence (including the sponsoring of mobile data) to older people who receive a monthly means-tested old age grant; older people are dependent on the assistance of younger ones to help them to navigate technology, generally, and their cell phones specifically (also see Hoffman, 2016; Hoffman, 2019 for a general overview of the interdependencies). There are thus existing or newly generated intergenerational dynamics (of whatever nature: good or bad), in spite of the digital divide and resulting from the interdependencies between the generations and the material presence of the cell phone.

These interdependencies offer a space/opportunity (albeit forced and compulsory) for intergenerational negotiation to respond to the aspirations, realities, and challenges of mobile technologies. Intergenerational eInclusion provides an opportunity to transcend the binary opposites currently prevalent in the discourses about older generations generally, and particularly in relation to ICT, including ability–disability, can–cannot, potential–unrealistic/unfeasible, good–bad, past–present, active–passive, digital natives–digital migrants, modern–traditional. Such binary oppositions around and about the digital divide reduce the possibilities for empathic understanding of the complexity of challenges and relations. However, these interdependencies do not necessarily make for a healthy intergenerational dynamic. Although they potentially create an ICZ for negotiation, reciprocities, and learning, we also observed that complexities related to familial or other close-knit interdependencies and dynamics within the private space could compromise intergenerational relationships and older individuals' optimal use of technology.

## 10.3.2 Intergenerational Contact Zones

Intergenerational contact zones serve as focal points for different generations to connect, interact, build relationships, and, if needed and desired, work together to address issues of concern. These ICZs—either through serendipity or design, or spontaneous or planned modes of interaction—can function as hubs for a wide variety of pursuits (Kaplan et al., 2020). In our case, ICZs around the cell phone open up new pathways for exploration and discovery across generations in real time or virtually. However, given the complexities related to familial or other close-knit dependencies and dynamics in the private space, the ICZ created around the cell phone in a planned intergenerational design in the public domain offers a range of opportunities to bridge diverse generational perspectives and experiences.

### 10.3.3 Planned Intergenerational Programming for eInclusion

The core idea at the heart of formal intergenerational programming is to facilitate a planned process of reflexivity through which to understand the generational other, what they value and their capabilities (Kaplan et al., 2017). Biggs and Lowenstein (2011, p. 108) describe this as generational intelligence: "allowing empathic understanding of oneself and other, and when contesting definitions of generation and ageing coexist, enhancing the possibilities for shared problem-solving". Such initiatives would take into account cohort expectations, historical and life-course experience, and ways to deal with ambivalences. Roos (2011) suggests that the space between the generations can be explored through an intergenerational group reflecting technique, wherein generations voice their needs and expectations in each other's presence to discover the generational other and to establish mutual ground.

### 10.3.4 Older User-Centric Participation towards eInclusion

As the WHO/UN Decade of Healthy Ageing launched in 2021, older persons, policy makers and practitioners are increasingly adopting and adapting to technology to protect and maintain health and to improve lives (Dixon, 2021). Where not adopted, these types of technology are increasingly contemplated for implementation. This acceptance and use of technology still goes against widely held assumptions—many founded in ageist attitudes—about older persons' perceived inability and unwillingness to learn, or to accept and adapt to changes. Instead, in reality, we are seeing how technology actually connects societies—within families, between caregivers and those for whom they care, and across generations.

Technological advances are becoming entrenched in many aspects of many societies; they hold the potential to create opportunities for inclusive and sustainable development, and provide tools to surmount the challenges faced by many individuals to participate fully in socio-economic development processes. However, limited and non-inclusive access to ICTs can intensify existing inequalities and create new ones. The Covid-19 pandemic is a case in point. Digital technologies have supported efforts to fight the virus by enabling access to health care (through e-health and telemedicine), allowed students to continue their education (through remote learning and schooling), and enabled businesses and workers to use teleworking to remain active and to contribute to their respective economies. Technology has provided access to goods and services through e-commerce, including food delivery services, for example. Importantly, it has enabled family and friends to stay connected through months of physical distance, thus helping to alleviate social isolation. Yet, it is also clear that these technology-based benefits are not equally shared by all countries or segments of society, and that, where access to and participation in

opportunities provided by digital technologies are relatively or highly limited, many have been left behind.

Including marginalized older adults more optimally in technology-related research requires facilitators who are familiar with the sociocultural context and implicit norms guiding intergenerational behaviour, and who apply relevant and appropriate social engagement facilitation strategies. A both/and approach is suggested, in which socio-gerontologists/gerontechnologists and design science experts work together in the development of a technology artefact from a needs-driven and user-centric perspective. This approach not only enhances the rigour of the academic project and the relevance of the artefact for long-term use and sustainability, but also maximizes the inclusion of older end-users more broadly.

Community-based ethics sensitive to diversity (context, relationships and older participants) not only guide the ethical conduct for this type of research project but also support the future adoption and use of technology artefacts and the inclusion of older individuals with diverse needs and backgrounds. Decision making in relation to older research participants subscribes to the ethical position that not only their rights but also their dignity need to be protected. Botes (2000) warns against narrow ethical-decision making where the application is favoured of objective universal rules, impartial enough to ensure the equitable treatment of everyone but oblivious of the place or uniqueness of the individual or of the community. Our study demonstrated that ethical research conduct needs to involve creative strategies to address the unique needs of their participants, enabling them to exercise choices.

## 10.4 The Bottom Line: Person and Technology/Environment Fit

Ageing and engaging with technology is complex; hence, following the thinking of Zaidi and Howse (2017 p. 8), we recommend a both/and approach: offer usable and useful digital solutions, attractive to older end-users to improve their quality of life on the one hand, and create a social environment that is rich in opportunities for encouraging and maintaining technology engagement in older persons on the other. Older persons' use of technology is not only a matter of individual competence but entails the attitudes, expectations, prejudices and ideals of the societies and cultures in which they develop and grow old (see also Coleman & O'Hanlon, 2004). Older persons differ in terms of their preferences and attitudes in their adaptation to and adoption of new technologies. Those working with older adults must therefore account for a wide range of physical and cognitive abilities and tailor (study) design and participant protection to account for that variance.

Certain "leverage points" are however, relevant within older end-users and in the technology environment (Menec et al., 2011, p. 486). To support such an (older) person and technology/environment fit we propose: formal intergenerational

programmes, supportive younger people acting as facilitators, and a bottom-up approach to design technologies fit for older communities' consumption and needs.

With its pledge to leave no one behind and "to reach the furthest behind first", the 2030 Agenda for Sustainable Development (UN, 2015; UNDP, 2018, p. 1) is centred in the ideals of inclusion of all nations, peoples and segments of society in economic, social and environmental progress. Ensuring that the SDGs are met for all segments of society means that all ages—including older persons, and with particular focus on the most vulnerable—should be minded. While it is necessary to address the intersectional discrimination against many older persons and their exclusion from eInclusion initiatives, we believe that it is imperative to go beyond treating older persons just as a vulnerable group. To achieve truly transformative, inclusive and sustainable outcomes for older persons, they must be recognized not only as beneficiaries *of*, but also as active agents and beneficiaries *in* societal development through the extraordinary opportunities offered by eInclusion.

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