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IT Skills of Young and Older People: A Qualitative Study

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ABSTRACT

Both younger and older people have different ways of using and interacting with technical devices (smartphones, laptops and tablets). This study compares both user groups and explores how the technical aids are used in everyday life, what barriers exist and how technical problems are handled. In July and August 2021, 20 semi-structured interviews with young and old people were conducted and analysed using qualitative content analysis. The results show that young people continue to use smartphones more frequently than the older participants and that smartphone functions such as making phone calls are more important for the older participants. Older people prefer a personal support by family members when technical problems occur, whereas the younger study participants favour the more impersonal option via hotlines etc. Finally, it seems to be useful to involve older people in the development process of new technologies, so that the applications can be designed to be as user-friendly as possible.

KEYWORDS

Aged; smartphone; young adult; computers; mobile applications

1. Introduction

Smartphones, laptops and tablets have become an integral part of everyday live. More and more services are web-based and available online. Online banking and online tax systems e.g. have now become the norm. Healthcare systems around the world are also becoming more and more digital (Gattner, 2020). Health apps, are playing an increasingly important role. The World Health Organisation (WHO) defines mHealth as "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices" (World Health Organization, 2011). In short, these are software programmes that are installed on mobile devices such as smartphones and/or tablets and are designed to help individuals manage their health (Ramdowar et al., 2023; Tarricone et al., 2021). There are few areas of everyday life that are not permeated by digital technologies (Tenzer, 2023; Wildenbos et al., 2019).

Older people can benefit from this "digital revolution". Technical devices and mHealth apps have the potential to preserve health and make everyday life easier for older people (Ramdowar et al., 2023). For example, smartphones and tablets make it possible to get in touch with children and grandchildren quickly and easily over long distances. MHealth apps, on the other hand, help to promote, preserve or improve the physical and mental health of users by motivating them to exercise or by quickly and easily recording or documenting blood sugar levels or heart rates (Chou et al., 2023; Ramdowar et al., 2023; Wang et al., 2022; Wu et al., 2019). Therefore, both tools help to keep seniors more self-sufficient and autonomous (Chou et al., 2023; Gattner, 2020; Wang et al., 2022; Wu et al., 2019).

In order to benefit from these various options, seniors must be able to use the devices and mHealth must be programmed appropriately for their age. Otherwise, the wide range of devices and applications creates a number of barriers. Research results continue to show that seniors have not enough skills to use the available technical devices appropriately (Charness & Boot, 2009; Reneland-Forsman, 2018; Schirmer et al., 2022). The reasons are age-related physiological changes (Mitzner et al., 2019; Wilson et al., 2021; Wu et al., 2019), but motivational factors and a lack of technical know-how are also a part of the problem (Mitzner et al., 2019; Wilson et al., 2021). In addition, user-unfriendly applications and a lack of contact points in the event of technical problems make user acceptance more difficult for the older participants (Paez & Del Rio, 2019; Peek et al., 2014; Ramdowar et al., 2023; Wildenbos et al., 2019).

An increasing body of evidence suggests the importance of involving potential users in the development process of new technologies. This is the only way to identify the needs and preferences of older people so that the application can be designed to be as user-friendly as possible (Awan et al., 2021; Mitzner et al., 2019). Therefore, we have conducted

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interviews with potential users in the various development cycles of a IT coordination system that is a part of the ELISE project (*ELISE - Entlastung der Pflegeinfrastruktur durch IT-basierte Einbindung spontanen bürgerlichen Engagements* [ELISE - Relieving the strain on the care infrastructure through IT-based integration of spontaneous civic commitment]), which aims to develop an IT-supported coordination system.

The primary focus of this study is on analysing the data from the older people, i.e. persons older than 60 years (seniors). This is because seniors are still underrepresented in this research field (Czaja, 2019). Citizens aged 65 years and above are frequently excluded from studies (Ramdowar et al., 2023), the focus in the context of digital devices and media being on young people (Boczkowski et al., 2018; Fernández-Ardèvol et al., 2022). With regard to the older people, there is a particular lack of answers to questions such as user acceptance and frequency of use of technical devices (Awan et al., 2021). Many studies are more specific and focus on a particular topic area - for example, the effects of a digital health programme on the well-being of chronically ill people (Pach et al., 2022) or the effects of cognitive deficits on the use of assistive technology (Young et al., 2020).

The overall aim of ELISE is to develop a low threshold coordination system that brings younger and older people together. People in need of help should be able to indicate this quickly and easily through the ELISE-system, and receive help promptly from their immediate environment. The role of the helper was ascribed to young people and the role of the help-seeker to older people because this was specified within the ethics application. Due to physiological changes, older people normally need more help in everyday life than their younger peers. In principle, however, both age groups can take on the role of help-seeker and helper within the system.

2. Theoretical framework

2.1. Age differences in the use of software applications and digital devices

The use of digital devices offers both young and older people a wide range of opportunities. Both participant groups use technical devices in combination with social media (SM) in different ways. Aichner et al., 2021 describes SM as follows: "In research, SM is generally used as an umbrella term that describes a variety of online platforms, including blogs, business networks, collaborative projects, social networks (SN) in enterprise, forums, microblogs, photo sharing, products review, social bookmarking, social gaming, SN, video sharing, and virtual worlds" (Aichner et al., 2021).

The younger generation often uses smartphones and apps such as Facebook or Instagram to present themselves by posting photos or videos, for social interactions with their peers and for entertainment purposes (Alhabash & Ma, 2017). Collecting "likes" by posting self-critical (self-derogatory) messages also appears to be a motive for using social media platforms (Bareket-Bojmel et al., 2016). Wang & Edwards (2016) indicate in their study that young people mainly use social media tools to maintain existing relationships, especially with close friends. The most frequently used tools are smartphones (93% of people between 23 to 38 years) and tablets (55% of people between 23 to 38 years) (Vogels, 2019).

Older people are much more sceptical about the use of platforms such as Facebook and Instagram. They use digital media much more specifically and with greater apprehension, i.e. they disclose less personal information and pictures about themselves online and form fewer friendship groups (McCosker et al., 2018). Seniors are much more interested in topic-specific forums and blogs. They also show more concerns about security and data protection with regard to social media platforms (McCosker et al., 2018). The smartphone is most frequently used to participate in digital life (68% aged 55 to 73) (Vogels, 2019).

Both groups show similarities in the use of WhatsApp. Provided the older individuals have a certain routine with the messaging service, both groups use the app similar frequency to get in touch with friends and family, exchange endearments and ask for support (Fernández-Ardèvol et al., 2022; Rosales & Fernández-Ardèvol, 2016, 2019).

2.2. Physiological age barriers influencing the use of digital devices

Cognitive changes play a major role in the aging process (Morey et al., 2017; Wildenbos et al., 2018; Wu et al., 2019; Yazdani-Darki et al., 2020). Physiologically, there is an age-related decline in fluid intelligence, which includes basic thought processes. Older people find it increasingly difficult to ignore irrelevant stimuli, cope with problems or even understand complex issues (Matysiak et al., 2019; Seifert, 2022). Older people also need more time to process information and learn new things, especially when attention needs to be divided (Kullmann & Seidel, 2005; Seifert, 2022; Siebert & Schmidt, 2021). However, these fluid abilities, are necessary to solve complex tasks on a computer and to operate software applications (Iancu & Iancu, 2020; Morey et al., 2017; Seifert, 2022; Wildenbos et al., 2018).

Changes in the sensory, motor, neuromuscular, visual and auditory perception of older people have a further influence on the use and handling of digital devices (Paez & Del Rio, 2019; Seifert, 2022; Wildenbos et al., 2018). The number of Meissner's corpuscles, which are responsible for the sensitivity of the skin, decreases (Saup, 1993). As a result, two buttons are often accidentally pressed simultaneously on the mobile phone keypad (Hermann et al., 2012; Iancu & Iancu, 2020). Furthermore, older people find it more difficult to precisely measure the smallest forces required to operate a mouse, just to name one example (Vieluf et al., 2019). Visual abilities are also impaired. In addition to limitations in focusing on near and distant objects, distinguishing colours or recognising contrasts, there are also problems concentrating on nearby objects (Iancu & Iancu, 2020; Wildenbos et al., 2018). In this context, Kim et al. (2007) point out in their study that visual problems occur primarily when the contrast between text and background is not strong enough.

2.3. Individual motivational barriers of older people

Other factors such as inexperience, lack of motivation or fear also have an influence on using technical aids and mHealth (Wildenbos et al., 2019; Wilson et al., 2021).

A qualitative study (Nymberg et al., 2019) suggests that older people (over 65 years of age) have less experience in dealing with mHealth, feel more insecure when using technology and are distrustful of new technologies (Nymberg et al., 2019). Pywell et al. (2020) provide results supporting this and also make clear that doubt in one's own abilities and lack of trust in digital interventions can represent barriers.

Fear of failure and frustration among older people also represent obstacles when interacting with mobile technologies and applications (Searcy et al., 2019). Experiences of failure due to incorrect clicking or overly complex applications increase the feeling of helplessness (Iancu & Iancu, 2020). In addition, a lack of technical support from family members (lack of patience and understanding) (Wilson et al., 2021; Zibrik et al., 2015) and a lack of technical support from the provider/operator make it more difficult to use the technology and mobile software applications (Cajita et al., 2018; Wilson et al., 2021).

Furthermore, the inner motivation or one's own inner drive to try out new things plays a role in the use of digital technologies (Wildenbos et al., 2018). For example, older people are more likely to turn away from digital applications if they are not convinced of their personal benefits in everyday life (Tyler et al., 2020).

In summary, barriers can arise in the ageing process that make it necessary to develop technical aids or mobile applications in an age-appropriate way so that hurdles during use are minimised and senior citizens can exploit the full potential of the technologies.

3. Methods

Semi-structured interviews were conducted with potential users, i.e. young people and old people, to explore their experiences and attitudes towards the use of technical aids in their daily lives.

The study protocol was approved (number: 2021-072) by the Ethics Committee of the Medical Faculty of Martin Luther University Halle-Wittenberg (18.05.2021).

3.1. Sampling

Participants were recruited in Halle (Saale), a medium-sized city in Germany. The majority of participants was recruited through cooperation with a residential housing cooperative. A small number of participants joined the project through recommendation and the researchers' network. The interviews were conducted by two trained researchers. At the beginning, participants were informed about the procedure and written consent was obtained. Participation was voluntary and withdrawal from the study was possible at any time. Table 1 shows the inclusion criteria of the two groups.

3.2. Data collection

A total of 20 semi-structured interviews with younger and older people were conducted by telephone or face-to-face in July and August 2021. Each interview lasted between 20 and 60 minutes. All interviews were recorded and transcribed verbatim. The interviews followed a semi-structured questionnaire. The guiding questions were developed by an interdisciplinary team of researchers (nursing scientists, business informatics specialists, software developers) and were based on a literature review (Appendix A & B). In the analysis presented here, we focus on the main theme of "digital devices", which was explored using the following guiding questions:

1. Do you use digital devices regularly?
2. What barriers have you encountered when using digital devices?
3. What would help you to use digital devices?

In the first part of the interview, we asked about the sociodemographic characteristics of the participants. The main part of the interview focussed on the participants' usage of assistive technology and difficulties in using assistive technology.

3.3. Analyses

The content analysis of the transcripts was carried out according to the method proposed by Kuckartz & Rädiker (2022) and was supported by the software MAXQDA (version 2022). The three main categories were formed mainly deductively on the basis of the interview guide. Each transcript was screened and relevant text passages were assigned to the main categories (1st coding process). The subcategories were completed inductively by using the available material, and important text passages were assigned to the subcategories (2nd coding process). Irrelevant text components were removed and elements with the same meaning were combined using the analysis software. Each transcript

Table 1. Participants'inclusion criteria.

Interviews with	
Younger people	Older people
No cognitive impairments	No cognitive impairments
Resident in Halle (living alone or in community)	Resident in Halle (living alone or in community)
Willingness to volunteer	People with need for support in their daily life, e.g. accompanying them to cultural activities; Willingness to volunteer.
Aged under 60 years	Aged 60 years or older

was coded by independent researchers and discrepancies were subsequently discussed in order to achieve an accurate assignment and to modify the category system accordingly.

4. Results

4.1. Participants characteristics

Participants age ranged from 27 to 83 years (Table 2). The mean age of the younger people was 36 ± 8.6 years and of the older people 74 ± 8.1 years, respectively; 68% of the participants were female, 32% male.

Table 2. Sample characteristics (n = 20).

	Younger people	Older people
Mean age ± SD, years (min-max)	36 ± 8.6 (27-56)	74 ± 8.1 (60-83)
Sex		
women	4	9
men	6	1
other	0	0
Living situation		
alone	–	4
with a partner	–	6
Living arrangement		
own property	–	1
housing association	2	6
other	8	3

4.2. Results of the interviews

The results of the surveys are presented below. The abbreviations "IOP" stand for "Interview with older people", "IYP" for "Interview with younger people" and "I" for "Statements by the Interviewer".

4.2.1. Use of technical aids (smartphone, tablet, laptop) in everyday life

When analysing the data in the category "Use of technical aids", four specific subcategories were created, based on the questionnaire (Appendix A & B). This sub-categorisation allows a more detailed differentiation of the results.

Device type and frequency of use. All potential seniors reported owning a smartphone and using it several times a day. The frequency of use varied from person to person. For example, one participant reported, "Oh, definitely 5-6 times" (IOP.2) and another reported, "So 15 to 20 times already" (IOP.9). In contrast, only five out of ten participants own a tablet or laptop. The difference in frequency of use compared to smartphones is also clear. Participants often use these devices only once a day, and in some cases only a few times a week (IOP.8: "Because I always get my emails here and I can follow everything here, I go to my PC maybe three times a week" or IOP.2: "So, the tablet once a day for the newspaper, because otherwise I have my smartphone").

Among the younger people, all participants reported owning a smartphone as well as a laptop and/or a tablet. Smartphones are used more often than tablets or laptops by all participants. One younger person said: "Any device that is more suited to me and that I can handle, I use more often and actually try to avoid my computer. Just like that. I have this thing in my hand from early morning till night. It's the first thing I have in my hand when I wake up and it's the last thing I have before I go to bed and then I turn the thing off and then I continue to watch on my tablet and kind of watch YouTube there (IYP. 4)". The exact number of times the younger people used the smartphone could not be determined, as the question was not answered accordingly due to the permanent use of the smartphone.

Purpose of use. Both groups of participants use the smartphone for similar purposes (Table 3). Three out of ten seniors said they regularly played games on the smartphone and/or tablet, whereas none of the young people mentioned this activity. Basic functions such as taking pictures or making phone calls on the smartphone were also not mentioned by any of the younger people. Several older people mentioned checking the weather, checking petrol prices, or finding out about medication side effects (IOP.9: "What are the side effects and what does the medical term mean") - these mentioned contents are summarised in the table under the term "Getting informed". Online banking was used by two out of ten seniors and eight out of ten younger people.

Table 3. Purpose of use of digital devices by younger people and seniors.

	Younger people	Older people
Smartphone		
Reading news	✓	✓
Navigation	✓	✓
Tracking vital signs	✓	✓
Online banking	✓	✓
Online shopping	✓	✓
Surfing the internet	✓	✓
Taking and sending pictures		✓
Getting informations e.g. weather, side effects, opening hours		✓
Making a phone call		✓
Laptop/ Tablet		
Checking & writing e-mails	✓	✓
Printing/scanning documents	✓	✓
Online banking	✓	✓
Watching movies	✓	
Reading news		✓
Playing games		✓
Surfing the internet		✓

Overall, the senior participants were much more detailed than the younger participants in their answers to the question "What do you use technical aid for?" The young people often answered the question "What do you use this technology for? e.g. reading the news, surfing the Internet, navigating to a meeting place, etc." with "Yes, everything (IYP.1)" or "I can actually do all of that, yes (IYP.6)".

App use. When asked which apps or programmes were regularly used on the smartphone, both groups (seniors and younger people) listed similar apps:

- WhatsApp
- Instagram
- Twitter
- Facebook
- YouTube
- Weather app
- Ntv (news app)
- DB (transportation app)
- Other, e.g. plant identification app, bank app, stay-friends, barcode scanner, Pinterest

All 20 participants used WhatsApp. Messenger services such as Facebook (seniors: 4/10; younger people: 5/10) and Instagram (seniors: 1/10; younger people: 5/10) were also used by both groups.

4.2.2. Barriers during the use of technical devices

In response to the question, "What barriers have you already encountered when using digital devices?", the young and older people responded differently.

Six out of ten older people reported no difficulties with the technical devices (IOP.2: "No": IOP.5: "No"; IOP.7: "No, not really"). Nor did they indicate any barriers when specifically asked about or offered potential difficulties. The following dialogues illustrate this:

I: "So is the keyboard on the smartphone always too small?"

IOP.2: "No, it works quite well."

I: "And with the app application or app functions, did you have any problems or a function that you didn't understand?

IOP.3: "No."

Four participants answered the question in more detail, indicating possible difficulties that older people might have with technology. Based on the barriers presented in the introduction, the participants' statements are categorised as "physiological age barriers" and "individual motivational barriers":

Physiological age barriers. IOP.8: "Exactly, the writing on the smartphone is too small *(=visual barrier)* and I didn't understand some things properly. Then it is better to take the laptop and to ask, because I can get it bigger and I can understand it better and cope with it better. If it's a short piece of information, then yes, but otherwise it's too small for me or there's so much in between that it disturbs me. Suddenly there's an advertisement in between and then I have my husband's stuff in there again, it just happens *(= cognitive barrier).* It is very disturbing."

IOP.10: "I can't do it as fast as those who have always used it." *(= cognitive barriers)*

Individual motivational barriers

IOP.1: "Well, I can't answer that 100%. For example, I can usually manage everything, but I had a few problems with the app for the road, i.e. for a car route, which didn't show up so well and so I ask the kids and then I can do it." *(=uncertainty & lack of knowledge)*

IOP.9: "What does each function mean and what is its purpose? It's hard to say." *(=uncertainty & lack of knowledge)*

The younger people answered in considerably more detail than the group of the older people. Participants were less focused on the difficulties that arose during the use of the technical aids, but they described problems that had already arisen during the use of a programme/app. Five separate subcategories of comments are distinguished in the following for a better understanding.

Advertising. Five out of ten younger people said they found advertising annoying while using a programme (IYP.7: "On Facebook, I find it incredibly annoying that there are so many ads"). Another participant is not bothered by advertising as long as it is personalised: "Or semi-personalised advertising on YouTube that doesn't quite match your search history (IYP.3)".

Security. One participant found too many security inquiries irritating: "Sometimes it annoys me with some programmes when they have so many security steps. There is sometimes "here, enter the password", and also the password and lots of different security auto-identification (IYP.1)". Another participant found logging in and out of an app a barrier: "What often bothers me is always this login process. I don't have that on my smartphone, where I'm always logged in. It's always a data protection issue, of course, but it gets on my nerves because I'm someone who likes to forget passwords, and I don't want to use the same password for every app or every system, because that's very questionable. And it is very time-consuming, when you always think "what was my password?" and then forget it again. (IYP.7)." Additional access requests from apps to the camera or the contact list, which the app does not need for the actual function, are also perceived negatively (IYP.9: "Or that the app needs some access that it does not actually need for what it does. The most extreme example is when your flashlight app wants to access your contact book and your location. Huh, what's the point of that?").

User interface. This sub-category summarises features that participants personally want to have in an app or programme. The following features were mentioned by participants:

- Intuitive and easy to use (IYP.8: "Well, I think it's nicer if something is a bit cleaner, I don't need five million functions, for I don't know what. So if it's intuitive and easy to use, not overloaded with all kinds of shit.")
- Large, user-friendly buttons (IYP.4: "Well, it has to be quick on the smartphone somehow and it has to be easy. I can't cope with small buttons. Large buttons I can use well.")
- Ability to filter content/filter function
- Report button to report messages

Changes in the design. One participant criticised updates, -which change the design of the app and make old functions disappear respectively them with new, more complicated ones (IYP.8: "It bothers me when updates make things worse. When it just doesn't work with typing. So it's incredibly annoying when I get an update and then there's a feature in it and it just doesn't work."). One participant also found it annoying to have a different design of an app on two devices, e.g. a smartphone and a laptop: "What also bothers me a lot is the difference between the smartphone layout and the computer. Most of the time I'm in the apps on my smartphone. But when I want to use them on the computer for some reason, they are completely different. The whole layout is different and everything works

differently. And then I have a hard time figuring out what I actually need to do. That really bothers me (IYP.10)".

Technical requirements. In addition, one participant criticised the too rigid technical requirements for specific apps, which are not provided by all technical devices as a safety barrier during use: "My Postbank app previously used the fingerprint sensor for biometric identification, but I no longer have a smartphone with fingerprint, only with face recognition. And my Postbank app doesn't support this. That's why I basically don't have a banking app on my smartphone anymore (IYP.2)".

4.2.3. Supportive framework conditions during the use of technical devices

In response to the third question, "What would help you to use digital devices?". participants in both groups gave different answers. An overview of the answers from both groups is shown in Table 4.

Eight of the older people said that they preferred to have a personal contact to help them technical problems or that they already used this contact in the form of family and friends. Four had already contacted friends and acquaintances as well as children and grandchildren in the event of technical difficulties (IOP.1: "Yes, we sort it out between friends or family if someone doesn't know something"; IOP.4: "My children, my boys"). In contrast, only five out of ten older people would watch a video explaining how to use an app or device. One participant commented: "The drawback of it is, I have my phone, I want to do something on it, I watch this video and I can't do it at the same time (IOP.8)," and another participant commented, "Yes, yes I do. But I always prefer to do it through the children and grandchildren (IOP.10)."

The younger participants also reported that they would like to have a personal contact or had already used one in the past. The difference with the comparison groups, however, is that the younger people did not use friends or acquaintances, but hotlines, contact forms or the chat function, or would use them in the future to ask questions or address problems (IYP.3: "A personal contact person would be nice"; IYP.1: "Well, of course it would be very practical if there was a hotline somewhere or a contact form or someone you could turn to"). A video tutorial might be watched by five of the ten younger people, although it was noted that this video ought to be very short. In this context, two participants additionally stated that they would uninstall the app if it did not work smoothly or if there was too much troubleshooting (IYP.4: "I would probably uninstall it. That's just the way it is"; IYP.1: "And I expect the help platform to be obvious, either I'm looking for an offer or I have an offer. If it's not obvious there, gone, gone, uninstall, not worth it.")

Table 4. Overview of supportive environment for use of assistive technology by the younger and older participants.

Participants	Category
Younger people	Personal contact (5/10) • Hotline/contact form/chat function (5/10) Video tutorials (5/10) Other: • FAQ (4/10) • Google (6/10) • YouTube video (2/10)
Older people	Personal contact • Friends and acquaintances (4/10) • Children and grandchildren (4/10) • Wife/husband/partner (2/10) Video tutorials (5/10) Other: • YouTube video (1/10) • Google (3/10)

5. Discussion

The present study compares the experiences of younger and older people with digital devices in the context of the ELISE project, in particular with smartphones. Twenty semi-structured interviews were conducted with both user groups to find out how often and which technical devices and applications are used in everyday life, what difficulties have already been encountered in using them, and what support measures would be necessary to better understand the device or application. The results form the basis for the development and design of the ELISE coordination system.

Comparing the results on the frequency of smartphone use, it is noticeable that the older participants also use their smartphones several times throughout a day. However, the older participants were more specific about the frequency of use than the younger. This is probably due to the fact that the smartphone is still perceived as a "tool" for making appointments or searching for information. A large-scale study in Germany with 1.004 smartphone users shows that the 30 to 49 age group uses their smartphone for an average of 151 minutes per day and people aged 65+ have an average usage time of 80 minutes (Bitkom, 2023). As none of the older participants stated the frequency of use in minutes, but rather the exact number, a comparison is not possible. Based on the information provided by the older participants, it can be assumed, that there was moderate use in everyday life. For the younger participants, it is similarly difficult to compare data with other study results, as the question about frequency of use was not answered precisely. On the basis of the statements made, however, it can be assumed that the average frequency of use is comparable to the survey conducted by Haas (2023). In general, our study results adds further evidence to the fact that the younger generation uses smartphones more frequently than the older participants (Rosales & Fernández-Ardèvol, 2019; Zhou et al., 2014).

The results on the use of a tablet and/or laptop by both groups are in line with the literature. For example, about 42% of people over 65 use a laptop and 20% use a tablet (Tenzer, 2022). The younger generation is also less likely to use a tablet and/or laptop than a smartphone (Bröhl et al., 2018).

Regarding the smartphone ownership, it is striking that all older people were equipped with a smartphone. However, this is not the norm for the age group of the over 60s. In contrast, a survey from 2021 indicated that 85% of people aged 60-69 in Germany own a smartphone (Arbeitsgemeinschaft Verbrauchs- und Medienanalyse

[VuMA], 2021). Figures from the USA show comparable figures, where only 68% of 55 to 73-year-olds used a smartphone in 2019 (Vogels, 2019). Why there are such large differences in smartphone ownership between these and other survey results is difficult to say. Older people in our study might not be representative.

Both groups gave similar answers regarding the purpose of using each device (see Table 3). When comparing the data for the smartphone, it is noticeable that the older people mentioned the functions “making phone calls", “taking pictures", and “sending pictures", but none of the participants in the younger group mentioned this activity. This finding is consistent with the results of the study by Rosales et al. (Rosales & Fernández-Ardèvol, 2019). Again, functions such as camera, phone and settings are described as more relevant for the older people than for younger people. Regarding laptop/tablet use, help-seekers mention the functions “check/read emails", “print/scan documents", and “read news” more often than the younger comparison group. Similar results are found in the literature. For example, Noichl et al. (Noichl & Schroeder, 2019) describe that older people often use the laptop for office work and the tablet to read news.

Social media usage rates are trending upwards in all age groups. However, it is still the case that younger people use social media significantly more often than the older people (Auxier & Anderson, 2021; Cotten et al., 2022; Seifert, 2022). For example, in a representative Swiss study with 1,130 participants, only 29% of those aged 65 and over reported using social platforms such as Facebook or Instagram (Seifert, 2022). A survey in the USA (n = 1502 participants) also shows that usage declines with age. For example, 73% of 50-64 year old persons used social media, compared to 45% of those over 65. Facebook and YouTube are the applications most used by older people (65+). Younger people (50-64) increasingly use YouTube, followed by Facebook and Instagram (Auxier & Anderson, 2021). The results of our study also show a trend in this direction. For example, five out of ten younger participants said they used Instagram, while only one out of ten older people used this app. Facebook (younger people: 5/10; older people: 4/10) and YouTube (younger people: 6/10; older people: 2/10) are also used more frequently by the younger participants than by the older ones. Older people are therefore also active on social platforms, but still less frequent than their younger counterparts. There are almost no differences in the frequency of use of the WhatsApp messaging service between the age groups, i.e. the older participants also use the messaging service more frequently in everyday life (Fernández-Ardèvol et al., 2022; Rosales & Fernández-Ardèvol, 2016, 2019). The results of our study reflect this as well. All 20 study participants use WhatsApp to maintain social contacts.

Our study results on the barriers that can arise when using smartphones/digital programmes in everyday life deliver small indications of possible obstacles to using the technology. Compared to other studies with a similar focus, only four out of ten seniors stated that they had difficulties using their smartphone. However, the few statements do reveal a trend. A number of seniors have limitations that can be categorised as “barriers due to physiological changes in old age". Two statements also suggest that “individual motivational barriers” also play a role in the use of technology.

One older people reported visual deficits when using a smartphone, which is also confirmed by other study results (Awan et al., 2021; Iancu & Iancu, 2020; Wildenbos et al., 2018). The age-related physiological visual changes in combination with the small display of the smartphone make it difficult to read texts and make surfing more difficult (Zhou et al., 2014). Symbols and texts should therefore be displayed larger for the older people or it should be possible to adjust the font/symbol size individually within the programme using appropriate functions (e.g. zoom) (Darroch et al., 2005). In addition, two statements from the older participants indicate that cognitive changes in old age also have a negative impact on device use. The excessive complexity of programmes, which also includes the appearance of unnecessary information such as pop-up adverts, is perceived as annoying. There is also a perceived slowdown in learning processes among older people. This is also consistent with other study results (Awan et al., 2021; Matysiak et al., 2019; Seifert, 2022; Wildenbos et al., 2018). One study reports, for example, that attention and working memory, which stores and processes short-term information, are particularly impaired in old age. This leads to difficulties in processing a lot of information. Seniors therefore work more slowly and tend to repeat mistakes (Iancu & Iancu, 2020; Kim et al., 2007; Wildenbos et al., 2018; Zibrik et al., 2015). Software programmes should therefore be limited to essential functions so that seniors are not overwhelmed by the wealth of information (Iancu & Iancu, 2020; Kim et al., 2007).

Uncertainty about programme functions and a lack of knowledge when using digital software programmes were further barriers mentioned by the seniors in the interviews. Both barriers also occurred among the participants in the study “Cybersecurity and Digital Exclusion of Seniors: What Do They Fear?” (Holgersson et al., 2021). A total of 79 study participants (7%) stated that they had barriers to the introduction of new technologies due to a lack of knowledge and low self-esteem (Holgersson et al., 2021). Nymberg et al. (2019) also clarify in their study that inexperience with e-health programmes is a hurdle (Nymberg et al., 2019). Fears, uncertainties and a lack of knowledge due to inexperience can be reduced through suitable training measures and training programmes for seniors and thus facilitate the introduction of new technologies (Holgersson et al., 2021).

The response pattern of the younger people differs from that of the older people. Younger participants do not mention difficulties that may occur during the use of the smartphone or software programs. Instead, they describe in detail which problems can occur or have already occurred during the installation and use of the application or programme. This means that the young people are describing their personal experience of using the application and not the device itself. This different response pattern is probably due to the fact that they are significantly younger than the comparison

group and therefore have fewer problems with font size, brightness, etc. In addition, the younger people use their smartphones more often, are therefore more experienced in using the device and can presumably concentrate more on the application than on the device itself.

When comparing the results for the third question, i.e. what would help both user groups when dealing with technical devices or applications, it is noticeable that the older participants prefer a personal contact when technical problems arise. Almost half of the older people also described that they had contacted friends, acquaintances and/or family members if they had technical problems in the past. Close relatives or good friends therefore seem to play a major role in overcoming technical problems. This is also supported by current studies. A survey with 24 participants (aged 65+) came to similar results and described that the participating seniors asked their family members, especially their grandchildren, for help in dealing with new technologies (Portz et al., 2018). The study by Francis et al. (2018) also emphasises the importance of social relationships in solving technical problems that arise. In this study, older study participants (mean age 77 years) also sought help from children, grandchildren and peers to solve technical difficulties (Francis et al., 2018). The younger study group also prefers personal contact, albeit in a more impersonal form via a hotline, a contact form or a chat function.

To summarise, it can be stated that family members and/or friends play an important role in overcoming technical problems/applications for the older people. It therefore seems useful to take this key role into account when introducing new technologies for older people. Furthermore, even if this was not specifically surveyed in our study, it would appear to be beneficial to provide older people with a personal contact person when new applications are introduced or to offer special information events in which the use of the technology is explained. This increases acceptance of new technologies/applications and leads to long-term use in everyday life (Cajita et al., 2018; Pywell et al., 2020; Wildenbos et al., 2018; Wilson et al., 2021).

5.1 Limitations

However, all these findings must be considered in the context of the limitations of this study. The results cannot be generalised. Apart from the small number of cases, the group of older people is a homogeneous sample with an interest in technology. Furthermore, the majority of the older people came from Halle-Neustadt, a socially disadvantaged area of the city with a low economic and educational status (Eckardt, 2006). The group of the younger people, on the other hand, was largely drawn from the researchers' network and thus had a higher level of education than the older people. As there was a collegial relationship between the interview partners, it cannot be excluded that the younger study participants already had information about the content of the study. This could have led to an unconscious influence on the questions and thus a distortion of the results.

Future studies should therefore be extended spatially to minimise the influence of educational status and create greater diversity. In addition, it seems useful to ask about the educational status of the participants in advance, as other research shows a positive correlation between smartphone use and educational status (Anderson & Perrin, 2017; Ma et al., 2016). Besides, prior experience with digital devices should be enquired as this variable may also influence the use of digital devices (Arning & Ziefle, 2007; Barnard et al., 2013; Blažič & Blažič, 2020; Kim et al., 2016). In addition, the qualitative data collection could be supplemented by a questionnaire in future studies in order to make the data more comparable in terms of frequency of use and more usable for research purposes.

6. Conclusion

Using a self-designed questionnaire (Appendices A and B), the ELISE project investigated how young and older people use digital devices, in particular smartphones. In the main part, the results of the study will be used to inform the development of the ELISE coordination system and will help to better understand the behaviour of older people with digital devices in order to break down barriers and make applications more senior-friendly during the development process. In addition, the results also suggest that existing software development methods, as they are currently applied, are not effective for the target group of older people and should be examined more closely in the future. The results of the study are briefly summarised below, based on the three research questions:

First research question: Do you use digital devices regularly?

- Older people still use smartphones less than the younger people. However, they are used more regularly in everyday life than tablets and/or laptops.
- All older study participants have a smartphone, although this is not the norm in the over-65 age group (Arbeitsgemeinschaft Verbrauchs- und Medienanalyse [VuMA], 2021; Vogels, 2019).
- Smartphone functions such as 'taking pictures' or 'making calls' are more functionally important for the older participants than for the younger people.
- Seniors also use social platforms such as Facebook and Instagram, but to a lesser extent than the younger comparison group. WhatsApp is used by both user groups in everyday life, for example to keep in touch with people of the same age.

Second research question: What barriers have you encountered when using digital devices?

- The data analysis identified a total of five barriers that can make it difficult to use technical devices/applications. Three barriers (visual barriers, barriers due to cognitive changes and slowed learning processes) were included in

the category ' Physiological age barriers' and two barriers (uncertainty about programme functions and lack of technical knowledge) were included in the category 'Individual motivational barriers'. All of these barriers have already been identified in former studies, thus confirming their results (Awan et al., 2021; Holgersson et al., 2021; Iancu & Iancu, 2020; Nymberg et al., 2019; Tyler et al., 2020; Wildenbos et al., 2018).

Third research question: What would help you to use digital devices?

- Older people prefer personal contact in the form of family members or friends when they encounter technical problems when using new technologies/applications.
- Younger people prefer a more impersonal form of help through a hotline, contact form or chat function.
- Both groups would watch a video explaining how the new technology works. For the younger people it is important that the video is short.

In conclusion, it seems to be useful to involve older people in the development process of new technologies. Due to their age, seniors have specific physical and functional needs that can complicate the introduction of new technologies if these are not taken into account. In addition, family members and/or friends seem to play an important role in dealing with technical problems/applications. Therefore, it is useful to involve family members in the process of introducing new technologies or to offer introductory sessions explaining how to use the technology.

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Disclosure statement

M. Haase, M. Bosse, S. Sackmann, and G. Meyer declare that they have no competing interests. For this article no trials with humans or animals were conducted by any of the authors. The data collected as part of this study were anonymized in accordance with the requirements of the German Federal Data Protection Act for the purpose of evaluation and publication. All studies performed were in accordance with the ethical standards indicated in each case. A positive vote by the Ethics Committee has been received.

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