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# Contextualizing digital literacy for older adults: a study based on focus groups and guiding theory☆

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ABSTRACT

The challenge of digital inclusion for an older adult population raises a need to design digital literacy strategies that are both engaging and effective in facilitating older adults' adaptation to today's technological world. For this purpose, it is necessary to establish the bases that will serve as a reference to contextualize the training initiatives. This qualitative study, guided by Selective Socioemotional Theory (SST) and the Selection, Optimization, and Compensation (SOC) Model, aims to provide these foundations for an adapted and motivating digital literacy approach for this population. To achieve this, 14 focus groups were conducted, using a sampling method based on age group (older vs. younger than 75), social context (users of social centers vs. university centers), and locality (rural vs. urban). To account for participants' personal characteristics, a two-step cluster analysis was performed, identifying three clusters. The findings revealed that the meaning of technology varies depending on age group, digital integration, and personal circumstances. This study provides a useful contextual framework for designing tailored digital literacy programs aimed at fostering digital inclusion among older adults.

## 1. Introduction

Many digital literacy initiatives aimed at older adults—whether delivered through public programmes, community centres, or third-sector organisations—tend to adopt standardised, one-size-fits-all formats that overlook the heterogeneity of this population. These initiatives often rely on generic curricula, uniform pacing, and task-oriented instruction that does not sufficiently consider age-related changes in cognition, motivation, or learning preferences (Barnard et al., 2013; Knowles and Hanson, 2018). Research has shown that when training does not align with older adults' needs, interests, or socioemotional priorities, it can lead to frustration, anxiety, or disengagement from learning processes (Heart and Kalderon, 2013; Tsai et al., 2015). Moreover, studies highlight that older adults frequently encounter barriers in programmes that fail to adapt to their prior experience, accessibility requirements, or preferred modes of support, resulting in reduced confidence and withdrawal from digital practices (Chaffin and Harlow, 2005; van Deursen and Helsper, 2015). These findings underscore the need for training strategies that are sensitive to older adults' motivations, capabilities, and life contexts, rather than relying on generalised approaches.

In this regard, there are two theoretical approaches that are particularly useful in interpreting digital literacy among older adults as an adaptation to the digital context from an aging perspective.

The Socioemotional Selectivity Theory (SST), proposed by Laura Carstensen (1991, 1995), offers a valuable framework for analyzing how older adults use and benefit from technology. According to this theory, as people age, their perception of time shifts, leading them to prioritize emotionally meaningful experiences and interpersonal relationships over other instrumental goals. This change in motivation directly

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influences how older adults adopt and use technology.

Several empirical studies based on SST have confirmed that older adults tend to adopt technologies that help them maintain social connections and enhance their socioemotional well-being (e.g., Chang et al., 2015; Liu et al., 2024; Xu et al., 2016; Zhou et al., 2023). For instance, Charness and Boot (2009) found that older adults are more likely to use digital tools such as social media and video calls when they perceive these platforms as facilitators of interactions with family and friends. This usage can also act as a mediator in reducing the likelihood of depression (Liu et al., 2024). Similarly, studies such as Leist (2013) and Fang et al. (2017) have shown that Internet use in old age is positively correlated with higher emotional well-being, as it helps reduce social isolation and strengthen emotional bonds, particularly with family members. Forsman and Nordmyr (2015) also suggested that regular Internet use can contribute to autonomy and emotional well-being in later life.

Additionally, evidence suggests that social motivations mediate the relationship between technology use and psychological well-being, while informational motivations mediate physical well-being (Sims et al., 2016).

On the other hand, the Selection, Optimization, and Compensation (SOC) Model, developed by Baltes and Baltes (1990), complements SST by explaining how older adults select specific technologies, optimize their use, and compensate for difficulties through adaptive strategies.

This model posits that throughout life, individuals develop adaptive strategies to maximize their abilities and minimize the limitations imposed by aging. In the digital context, older adults can select (S) specific technological tools, optimize (O) their use through continuous learning, and compensate (C) for difficulties with external support or technological adaptations. For example, Nimrod (2019) suggests that ICTs play a role in all three SOC processes and that their effective application facilitates adaptation and enhances subjective well-being. Specifically, the SOC model explains how older adults can benefit from technology through three key mechanisms:

Selection: Focusing on technologies that fulfill specific needs, such as video call applications to stay connected with family and friends (Leist, 2013), which contribute to socioemotional well-being (Carstensen, 1995). Qualitative studies have reported that older adults are willing to invest time and effort in learning and using ICTs, provided they perceive them as effective tools for achieving life goals (Burnett-Wolle and Godbey, 2007; Joshi et al., 2020).

Optimization: Developing strategies to maximize technology's benefits, such as participating in digital literacy courses tailored to this population (Barnard et al., 2013).

Compensation: Overcoming physical or cognitive limitations through peer, family, and friend support (Chaffin and Harlow, 2005), as well as accessible tools like voice assistants and intuitive interface designs (Czaja et al., 2006).

Based on the Selective Optimization and Compensation (SOC) theory of adaptation processes, the authors believe that the introduction of ICTs through selection and optimization strategies can be a successful means to ensure the effective uptake of these technologies.

### 1.1. Research objectives and questions

In order to establish a strong foundation for designing effective programs tailored to this demographic's needs, SST and SOC offer complementary perspectives.

On one hand, SST highlights that older adults tend to focus on relationships and activities that bring them emotional well-being. Empirical studies have demonstrated that integrating these theories can be effective in digital literacy for older adults. For example, studies such as those by Chopik (2016) and Tsai et al. (2015) have demonstrated that digital literacy programs tailored to older adults, incorporating emotional and social dimensions, improve engagement and long-term retention of technological skills.

On the other hand, the SOC model (Baltes and Baltes, 1990) focuses on three adaptive strategies: First, the selection of meaningful and important goals and activities. In digital literacy, this could mean that older adults choose to learn technologies that help them stay connected with loved ones or access relevant health and well-being information. Secondly, optimization, which involves improving and refining the necessary skills to achieve these goals, such as participating in technology training programs and using educational resources adapted to their needs. Lastly, compensation, which refers to using alternative strategies or external assistance to overcome limitations, such as simplified device interfaces or family and friend support in learning new technologies.

Based on these theoretical approaches, the study had two main objectives:

(a) To provide findings that confirm how older adults' perceptions of technology vary based on age, life circumstances, and level of digital integration.
(b) To establish an example of a contextual framework for designing digital literacy programs aimed at fostering digital adaptation among older adults.

According to SST, as people age, they tend to choose technologies that facilitate social interaction and are emotionally meaningful. Likewise, the SOC model suggests that older adults will use technologies to adapt to their environment and meet their life needs. Thus, the first research question (RQ) was:

**RQ1**: Considering age group, social context, quality of life, perceived well-being, and Internet access, what purposes do older adults use technology for in relation to their daily activities and well-being?
The SOC model suggests that older adults tend to choose technologies that help them adapt to their environment and meet their life needs, using strategies to compensate for deficits. The second research question was:
**RQ2**: Considering age, social context, quality of life, and Internet access, what benefits does technology use provide, what obstacles do older adults encounter, and what support do they tend to rely on?

## 2. Method

### 2.1. Research approach

In order to address the research questions, a qualitative research approach based on the Guiding Theory was chosen. This approach starts from a conceptual or theoretical framework that guides and structures the qualitative research process without imposing rigid restrictions, allowing the study to explore new interpretations or directions (Maxwell, 2013).

As previously mentioned, the Socioemotional Selectivity Theory (Carstensen, Isaacowitz and Charles et al., 1999) and the Selection, Optimization, and Compensation (SOC) Model (Baltes and Baltes, 1990) were used as theoretical frameworks.

To find answers to the research questions, each of these theories helped in the identification of: (a) How older adults use technology and the benefits they obtain depending on their social context and age group. (b) The mechanisms they use to optimize technology usage and compensate for difficulties in using it.

### 2.2. Data collection method

Focus groups were used as the data collection method. These consist of a group interview led by a moderator using a structured topic guide, encouraging interaction among participants as a way to generate information (Prieto Rodríguez and March Cerdá, 2002). Throughout the research process—covering the design, implementation, and later

analysis of the focus groups—the COREQ checklist (Consolidated Criteria for Reporting Qualitative Research) was followed (Tong et al., 2007).

The research team consisted of 13 members (10 women and 3 men), all of whom were experts in the research topic and had experience in qualitative methodology and moderating focus groups and interviews. At all times, it was ensured that the moderator had no prior relationship with the focus group participants or the social context in which the data was collected (Tong et al., 2007).

The focus group script included a series of questions related to the participants' sociodemographic aspects and open-ended questions derived deductively from the reference theories (Table 1).

On the basis of SST (Carstensen, 1991), the study aimed to analyze technology use within the context of aging and socioemotional well-being. The SOC model (Baltes and Baltes, 1990) was used to examine the extent to which technology provides benefits, and the strategies older adults use to compensate for limitations and access difficulties.

Each discussion forum lasted approximately 1.5 h and included 6–8 participants from either a community social center or a university classroom for older adults.

The focus groups were moderated by members of the research team, while conversations were recorded by the technical team. To document non-verbal communication, a team member conducted observational recordings.

To control for participant profiles, a questionnaire was administered before the discussion began, collecting information on age, gender, frequency of Internet use, and perceptions of quality of life, health, and digital competence.

Before participating in the discussion, all participants signed a consent form agreeing that their data would be treated anonymously, confidentially, and for research purposes only.

### 2.3. Sampling strategy and context

Fourteen focus groups were conducted in the region of Andalusia, Spain, using contextual and personal variables that are known to influence the use of technology as selection criteria (Tirado-Morueta et al., 2021a, 2021b; van Deursen and Helsper, 2015, etc.), such as age group (under 75 and over 75 years old), social context (participants in university programs for older adults and participants in community social centers), and place of residence (rural and urban) (Fig. 1).

These sampling criteria were selected because previous research has consistently shown that age group, social context, and rural–urban residence significantly influence older adults' access to, use of, and attitudes toward digital technologies. Studies have demonstrated that age-related differences shape motivations, perceived barriers, and patterns of technology adoption (e.g., Barnard et al., 2013; Heart and Kalderon, 2013). Likewise, participation in community social centres or university programmes for older adults has been found to affect digital engagement, opportunities for learning, and levels of social support (e.g., Fernández-Ardèvol and Rosales, 2017; Tsai et al., 2015). Additionally, the rural–urban divide is well documented as a determinant of digital access, infrastructure availability, and digital literacy outcomes among older populations (van Deursen and Helsper, 2015; Salemink et al., 2017).

In total, 95 individuals over the age of 65 (39 men and 56 women) participated, all of whom were involved in programs promoting active aging, including digital literacy. Of these, 43 were participants in university programs for older adults, and 52 were users of community social centers. Regarding their place of residence, 34 participants lived in urban areas, and 61 lived in rural areas. Finally, by age, 61 participants were under 75 years old, and 34 were over 75 years old. The focus groups were held between November 2024 and February 2025.

**Table 1**
Questions and reference theories.

| Questions | Clarifying questions | Underlying theories |
|---|---|---|
| Let's start with an introduction from each of you: your name, age, whether you live alone or with others, and what your daily routine is like… | Age (if they wish to share), average level of education, whether they live alone or with others, well-being. | SST |
| Tell us about your daily life and what you would like to do. | Perception of time horizon<br>What are your routines at home? | |
| Please tell us what digital devices you own and how you use them (mobile phones, computers; what you use them for, when you use them, whether you enjoy using them, etc.). | How do you use the Internet, mobile phones, and computers?<br>What do you think about the presence of technology in daily life? | |
| Now we would like to specifically know what your opinion is on the Internet, whether you find it useful in your life, and what benefits it brings you. | If applicable, what motivates you to use technology? What do you use it for? And what would you like to use it for?<br>Benefits/advantages that the use of technology brings to your daily life. | SST<br>SOC MODEL |
| Tell us about your skills and challenges when using digital devices (mobile phone, tablet, PC, laptop). When you have difficulties using technology, what do you usually do? | Lack of digital skills and obstacles to using and making the most of technology<br>Social support | SOC MODEL |

### 2.4. Coding process

To systematize the information through transcriptions, a codebook was created (available in https://doi.org/10.6084/m9.figshare.25908775.v3). A specific code was determined for each variable. This codebook was later implemented in the NVivo 14 program (QSR International, 2023), whose specific functionalities, such as text analysis, automatic coding, and the generation of concept maps, facilitated the processing and interpretation of qualitative data.

After an initial proposal, and to ensure the robustness of the category and code system, several triangulation meetings were held with the 4 coders, all of whom were researchers on the team and moderators in the focus groups. Thus, inductively, significant areas of overlap were identified, and some categories and codes were grouped into broader themes. In this case, the inclusivity of each category was considered by evaluating its ability to cover the different dimensions addressed.

Another aspect considered was that the various categories were mutually exclusive, to avoid redundancies or confusion in the coding process. Additionally, their clarity and relevance for the study were examined.

Finally, the percentage agreement between two of these evaluators (both authors) was also assessed, with a percentage of 98.96 % and a Cohen's weighted Kappa of 0.79, which demonstrates good inter-rater reliability (Landis and Koch, 1977; Altman, 1990). This value was obtained after calculating the observed agreement proportion ($SP\_o = 0.9896$) based on the classifications made by the observers in a total of 7 documents. The high agreement percentage along with a Kappa value indicates that the coding system is sufficiently clear, that the evaluators are well-trained, and the evaluation process is rigorous.

### 2.5. Data analysis process

Taking into account the principles of the theories that guided the study, which assert that the use and appropriation of technology depend on the social context, resources, and quality of life of the individual (van Deursen and Helsper, 2015), a brief survey was applied to each participant ($n = 96$) in each of the focus groups ($n = 14$). This survey collected sociodemographic data and information on the frequency of Internet

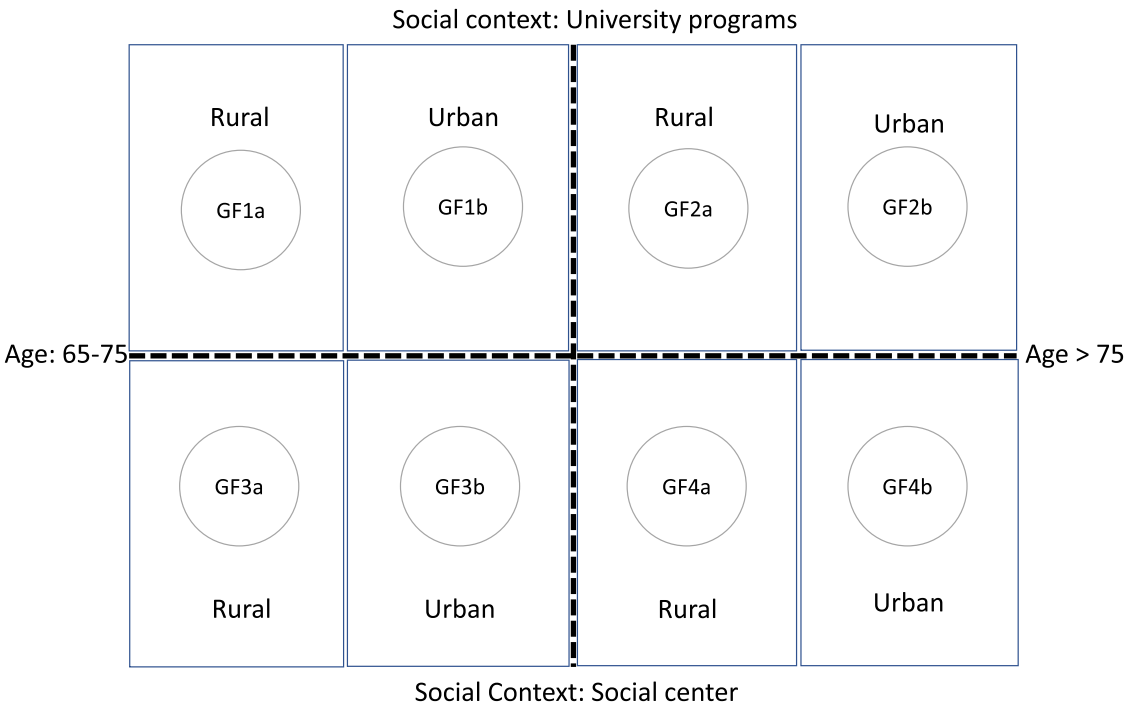


**Fig. 1.** Criteria for sample selection.

use, perception of their digital competency and social support, health status, and quality of life.

According to the Socioemotional Selectivity Theory (SST), and given the heterogeneity of this population segment, a cluster analysis was conducted to identify profiles and anchor the analysis based on the following ordinal variables (increasing range from 1 to 5): (a) their quality of life rating, (b) satisfaction with their health status, (c) perceived social support, (d) perceived digital skill level, and (f) frequency of Internet use. This cluster analysis was of a two-step type, as it is suitable for ordinal variables, using the Bayesian Information Criterion (BIC) for automatic estimation of the number of clusters, which is recommended for small or medium-sized datasets where the risk of overfitting is higher.

As a result of the analysis, three clusters were obtained (Table 2) with an acceptable silhouette of cohesion and separation. Based on the sampling criteria, Cluster 1 consisted of 38 participants, aged over 75 years, of whom 25 participated in university programs for seniors and 13 were from community social centers. Cluster 2 consisted of 36 participants under 75 years of age, who were users of community social centers, and Cluster 3 consisted of 28 participants under 75 years of age, who participated in university programs.

**Table 2**
Descriptive Analysis of Clusters.

| | Mean (SD) | | |
|---|---|---|---|
| | Cluster 1 ($n$ = 38) | Cluster 2 ($n$ = 36) | Cluster 3 ($n$ = 28) |
| Quality of life rating | 3.81 (0.95) | 3.61 (0.90) | 3.85 (0.71) |
| Satisfaction with health status | 3.42 (1.08) | 3.38 (0.96) | 3.21 (0.86) |
| Perceived support | 3.57 (1.29) | 3.69 (1.21) | 4.39 (0.83) |
| Perceived digital skill level | 2.57 (0.86) | 2.52 (0.84) | 2.57 (0.69) |
| Frequency of Internet use | 2.89 (1.41) | 3.16 (1.18) | 3.71 (0.90) |
| Under 74 years old | 0 | 36 | 28 |
| Over 74 years old | 38 | 0 | 0 |
| University program participants | 25 | 0 | 28 |
| Community social center users | 13 | 36 | 0 |

According to the descriptive analysis, the clusters were characterized as follows:

Cluster 1: Older adults (75+) with low technological integration. This group reports a positive perception of their quality of life and satisfaction with their health status. They have less interaction with technology, and their perceived social support is at an intermediate level.
Cluster 2: Adults up to 75 years old with social and technological barriers. This group ranks at a medium level across most indicators. They have low Internet usage frequency and digital skills, and their social support network appears to be limited.
Cluster 3: Digitally well-integrated adults. This group stands out for perceiving high levels of quality of life and possessing good technological skills. They frequently use the Internet, and their perceived social support is high. They are more connected and socially supported.

Based on the sampling design—i.e., the social context (universities vs. social centers) and age range (55–74 years vs. over 74 years)—the clusters were distributed as represented in Fig. 2.

Since each participant was identified with a code composed of age group, gender, context, location, and center, it was easy to associate each participant with their corresponding cluster. For example: CVU75JRJ8, where C (code for social center) vs. U (university), V (male) vs. M (female), U (urban) vs. R (rural), 75 (code for those over 74 years old) vs. 65 (under 75 years old), JR (initials of the study center), and 8 (order of participation in the focus group). Finally, to guide the analysis and answer each RQ, with the support of NVivo 14 software, a count of codes and a coding similarity analysis were conducted within each cluster using Pearson's correlation coefficient. To answer RQ1, the codes related to technology use, daily activities, and perceived well-being were used (Table A1), and to answer RQ2, the codes related to the advantages that technology offers in daily activities, lack of digital skills and obstacles, and perceived social support were used (Table A2).

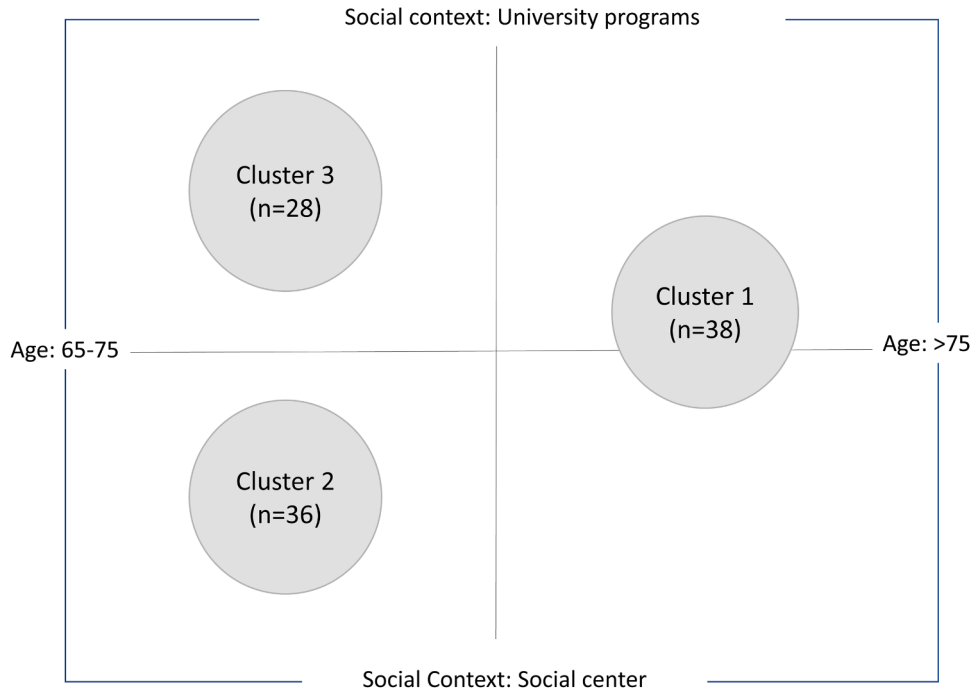


**Fig. 2.** Distribution of clusters based on sampling criteria.

## 3. Results

### 3.1. RQ1

The code count highlights the most frequently mentioned aspects regarding their use of technology in daily routines (Table 3 and Fig. 3). A transversal analysis of the clusters reveals that the prevalence of technology use for administrative tasks (finances, administration, health, etc.) is highest in the most digitally integrated cluster (Cluster 3), whereas the use of technology as a means of communication is more prevalent among individuals over 74 years old (Cluster 1).

Additionally, there is a notably higher prevalence of technology use as a source of learning in the most digitally integrated cluster. A more detailed analysis of each cluster is presented below.

**Table 3**
Code count, RQ1 in clusters 1, 2, and 3.

| Codes | Cluster 1 ($n$ = 38) | Cluster 2 ($n$ = 36) | Cluster 3 ($n$ = 28) |
|---|---|---|---|
| Daily Activities\Household Activities | 46 | 65 | 23 |
| Daily Activities\Sports | 30 | 50 | 8 |
| Daily Activities\Basic Needs | 4 | 12 | |
| Daily Activities\Leisure | 35 | 63 | 18 |
| Daily Activities\Social Participation | 21 | 51 | 25 |
| Well-being\Adequate Physical Well-being | 3 | 18 | 8 |
| Well-being\Inadequate Physical Well-being | 13 | 20 | 3 |
| Well-being\Adequate Mental Well-being | 10 | 33 | 10 |
| Well-being\Inadequate Mental Well-being | 13 | 18 | 1 |
| Technology Use\Task Automation | 4 | 10 | 13 |
| Technology Use\Information Search | 21 | 55 | 15 |
| Technology Use \Communication | 27 | 38 | 23 |
| Technology Use\Entertainment | 7 | 23 | 22 |
| Technology Use\Education/ Training | 2 | 9 | 8 |
| Technology Use\Administrative Tasks | 10 | 51 | 55 |
| Technology Use\Does Not Use Technology | 8 | 12 | 5 |

#### 3.1.1. Cluster 1

**(a) Use of technology as a means of communication and access to information**

The comments from this group were very centered on the use of technology as a means of communication ($f$ = 27) and as a source of information ($f$ = 21). There were fewer references to its use for administrative tasks ($f$ = 10) and entertainment ($f$ = 7). Moreover, some participants mentioned not using technology ($f$ = 8). The testimonies from this sector of participants showed how they use the Internet in their daily routines, both as a means to communicate with family members and as a source of information and for administrative tasks. For example:

"For me (the smartphone) is useful because my daughter is in Huelva, and my grandson… they call me every day, we talk by video call, and I also call them. Instead of calling, I do a video call, and that way I can see them." EMR75PUE4

The use of technology as a source of information was frequently associated with multiple aspects of daily activities. For example:

"For example… the car keys ran out of battery, and it's hard to dismantle the case of the battery. I took the computer, and my granddaughter said, 'Grandpa, look.' She went online, and found the instructions to dismantle the case for me." CVR75RIO4

The use of technology for administrative tasks, such as financial or health management, or online shopping, is often integrated into the daily routines of this group of older adults. However, there were signs of a cautious approach to using technology from various aspects of their lives. For example:

"You can manage your bank tasks, have access to the Social Security System. Well, you can handle everything here (on the smartphone)… So far, I've managed to make an appointment." CVR75RIO2

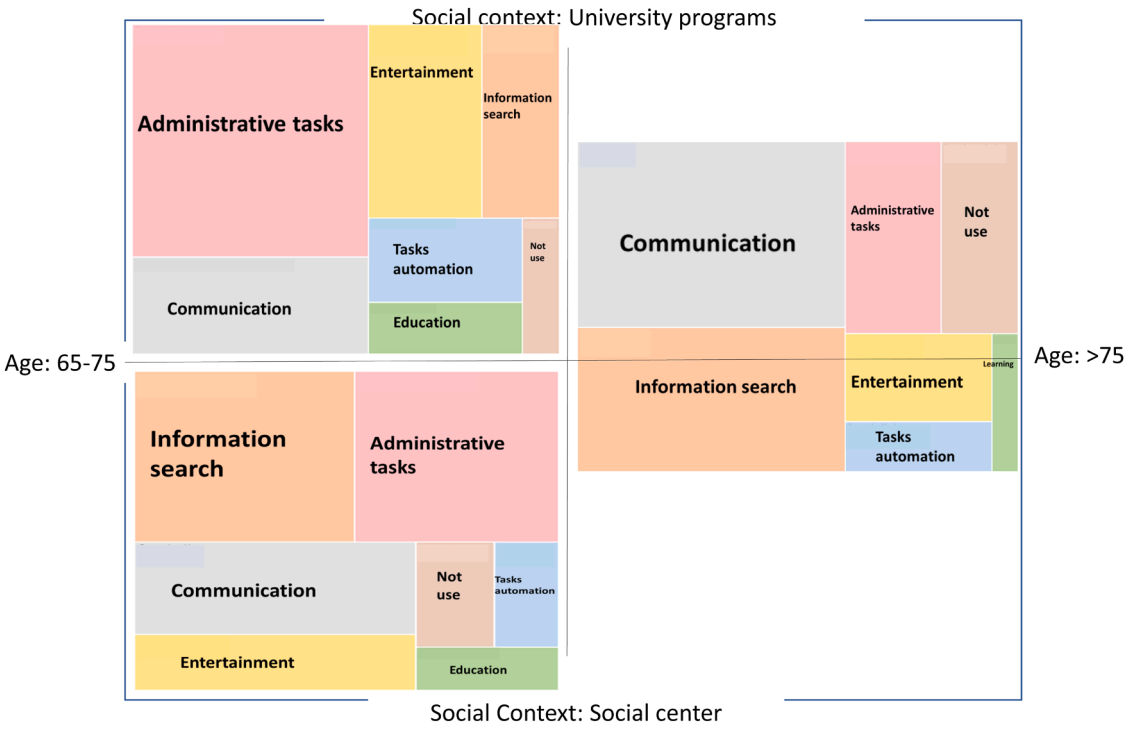


**Fig. 3.** Hierarchical maps based on cluster, RQ1.

**(b) Access to information and communication as a source of well-being**

The correlation analyses (Table A1) revealed, on the one hand, co-occurrences between the use of technology to find information and carry out administrative tasks, and physical and mental well-being (both favorable and unfavorable). These results suggest a relationship between information-seeking and physical and mental well-being. For example, the use of the Internet as a means of finding information on various leisure activities with the goal of staying active:

"I really enjoy learning… I normally use WhatsApp groups for academic purposes, with my classmates, (also) with my family, my children. I sign up for everything… because I've always loved learning and I didn't have the opportunity to do it when I was young…" CMU75JRJ2.

Some comments illustrated how searching for resources on the Internet can facilitate cognitive activity and, consequently, mental well-being:

"(It's about) keeping the mind agile, the brain and the body, both of them. The body through regular, gentle exercises, and the mind with exercises, questions, solving a crossword or (…) seeing images and relating them to others, listening to music and identifying the artist and song name (through gestures)…" EM75HUE2.

Furthermore, it was observed that in some cases, using social media as a means of communication could lead to emotional satisfaction through reunions with old friends or acquaintances:

"I use WhatsApp daily to say good morning, good night, where are you, what are you up to, friends… now you reconnect with someone you haven't seen for 25, 30 years, and (you contact them) on WhatsApp and ask: do you know who I am?, and you have four conversations. It's simply… a universe that hooks us all." CVU75JRJ7.

### *3.1.2. Cluster 2*

**(a) The multifaceted use of technology in daily activities**

In this cluster, comments mainly regarded the use of technology as a source of information ($f = 55$) and as a tool for administrative tasks ($f = 51$), and to a lesser extent, as a communication channel ($f = 38$). Other prevalent references were about using technology for entertainment ($f = 23$), and there were also references of people who do not use technology at all ($f = 12$). Furthermore, correlations were found between the use of technology for administrative tasks, information seeking, and as a learning resource (Table A1).

It was common to find comments where the use of technology for administrative tasks was linked to household activities (e.g., medical appointments and consultations, banking management, etc.). For example:

"In 'Clic Salud' app I check all the tax matters, if I need to make a medical appointment, …, the medication I have to take, my wife helps me. I have everything on my phone, my bank account, I manage everything (from the phone). Even though some people might ask: 'aren't you afraid of having everything there?', I say: 'I've gotten used to it'" CVU65HUE3.

This highlights how technology has become an essential tool for organizing the daily lives of many older adults, alleviating the burden that such tasks might usually impose. Moreover, integrating multiple applications into one device can increase trust in technology.

Certain technologies are often used for multiple purposes, such as being a source of information and entertainment. For example, applications like WhatsApp and Facebook are commonly used not only to stay in touch with friends and family, but also as a consultation resource and a way to pass the time and stay up to date with what is happening in their environment:

"I'm on my phone from the morning until I go to bed, what I mostly do is check WhatsApp and Facebook, since I have a Facebook account and I open it for the sake of looking, not to be bored. Also, when we need to make a query about something. For example, today we were using it to look at a sofa…" CVU65JRJ5.

It is worth noting the frequent correlation between the use of technology as a source of information for multiple purposes. The following example shows how access to information allows for learning quickly any ad hoc need:

"I use YouTube and Google. For example, yesterday I dismantled the door of my daughter's car to install the mirror, (since) to put the mirror,

I had to disassemble it completely, change all the pieces" CVU65JRJ2.

**(b) Access to information as a source of well-being**

The codes for information seeking and learning frequently coincided with positive states of physical and mental well-being (Table A1). Many comments highlighted that, in addition to being a recreational resource, technology can be used as a source of information and learning, associated with feelings of well-being. In this regard, the following comments were found:

"I use it (the smartphone) every day, also the tablet, I like it, to look things up. I like to do macramé, crochet, all of that. (I download programs) and do things on it, cooking stuff, I search for music (…) The thing is, I don't know, but if I knew more, I'd get even more hooked. Well, and then I also have Alexa, who's like my friend" CMU65JRJ3.

Additionally, comments were found where the use of technology for communication was associated with physical discomfort, such as cases where people with physical limitations use technology to compensate for the lack of communication with friends and family due to their impairments. For example:

"I do everything I can. I have some problems… (It's been) 23 years I've been blind in my left eye, but well, I manage well. I started from scratch, like a child learning to walk, and (…) little by little, I manage… I have WhatsApp, and WhatsApp groups… I use it to stay in contact with many of my friend groups. It would be difficult to be calling all 10, 12, or 14 (friends) every day, to check how they are… but with WhatsApp, I'm constantly in touch with them" CVU65HUE3.

The previous comment shows how, despite the physical difficulties some people face, technology becomes a crucial tool for socialization and well-being.

Finally, comments were found that suggest that physical and mental discomfort can be a source of disinterest in technology among older adults. For example:

"I had a stroke about five years ago… there are days when I don't get up well, and the day doesn't go well… it goes awry. Now, when it goes well in the morning, everything goes well. It's very hard for me. I lack reflexes, memory problems… I don't see myself using it (referring to technology)… first of all because I have no interest. Secondly, because well, I would have to make a great effort to learn" CVU65HUE4.

### 3.1.3. Cluster 3

**(a) The integrated use of technology in daily life**

In cluster 3, comments regarding the use of technology for administrative tasks ($f = 55$), communication ($f = 23$), entertainment ($f = 22$), and information seeking ($f = 15$) were more prevalent.

The participants' comments were highly focused on the use of technology in multiple aspects of their daily lives. The integration of multiple applications into a single device reflected a high level of technology acceptance among this group of participants. For example, task automation, quick access to entertainment, information seeking, and communication provided by technology tend to simplify their daily routines. For example: "I can manage at a basic level, emails, attaching files, looking for trips with flights, trains, the doctor, making appointments at the bank… checking account movements, purchases…" EMR65VIL8.

Another common example of the multifaceted use of technology in this group of participants can be observed when seeking information for entertainment, communication, and learning purposes. For example:

"I go onto Google every night, and (I usually search for information about) the Queen Juana la Loca, the Queen, the King Juan Carlos, the Catholic Monarchs, the Iberians… we do this (both my partner and I)." EMR65PUE4.

**(b) Technological efficiency and its relationship to well-being**

Although only evidence of a correlation between task automation and physical and mental distress was found (Table A1), numerous comments highlighted the satisfaction that comes with using technology to make the most of free time through stimulating activities:

"Technology, for me, is a fantastic thing. (When) being at home… or the time I waste being on the bus and (being able to) brush up on my English, which is my pending task." EMU65HUE3.

In some cases, people with health issues seek information online to manage their well-being, as it provides an accessible way to find alternatives to conventional treatments. This dynamic is illustrated in the following comment:

"… I look for stuff related to natural remedies, I really like learning about herbs and what they're good for. I'm allergic to medications, so if I have some pain, I search for what can help with it. I buy what works for me, and that's it…" EMR65LEP2.

Other comments showed how the efficient management of time facilitated by digital applications can lead to a sense of well-being. For example:

"… In fact, I have my digital certificate integrated into my phone, and all my appointments, doctor's appointments, Uber bookings, social security appointments (and also) the banking app. I do all my inquiries on my phone, I use it a lot to find locations when I go on trips… I integrate it into the car and it takes me to places. I have many apps, (I check) the news, and (I use it for playing) math sudoku and some jigsaw puzzles… I'm not at a very advanced level, but I use it and it distracts me a lot. It helps me organize my time (…). Before, I didn't use it much due to my work, but now (that I'm retired) I'm rediscovering it and I feel very satisfied." EV65LEP4.

## 3.2. RQ2

The frequency analysis (Table 4 and Fig. 4) shows the frequency of codes related to the main benefits or advantages of using technology, as well as those related to the most commonly reported obstacles among participants.

In general, fewer comments were observed from participants in cluster 3, which could be interpreted as evidence that technology is more integrated into the lives of this group than in the other clusters. However, while clusters 1 and 2 focused on the communicational virtues and access to information that technology facilitates, cluster 3 had more frequent comments related to the technological efficiency in carrying out daily routines.

A detailed analysis will follow based on the cluster to which

**Table 4**
Code Count, RQ2 in Clusters 1, 2, and 3.

| | Cluster 1 ($n$ = 38) | Cluster 2 ($n$ = 36) | Cluster 3 ($n$ = 28) |
|---|---|---|---|
| Advantages Associated with the Internet\Access to Information | 13 | 30 | 5 |
| Advantages Associated with the Internet\Learning | 7 | 24 | 1 |
| Advantages Associated with the Internet\Autonomy | 8 | 13 | 3 |
| Advantages Associated with the Internet\Fast and Effective Communication | 15 | 35 | 4 |
| Advantages Associated with the Internet\Entertainment | 3 | 6 | - |
| Advantages Associated with the Internet\Ease of Performing Tasks and Activities | 11 | 23 | 5 |
| Digital Barriers\Physical or Cognitive Difficulties | 25 | 33 | 4 |
| Digital Barriers\Limited Social Support | 1 | 6 | 1 |
| Digital Barriers\Lack of Resources | - | 3 | - |
| Digital Barriers\Fear and Distrust | 15 | 55 | 34 |
| Digital Barriers\Resistance to Change | 21 | 33 | 19 |

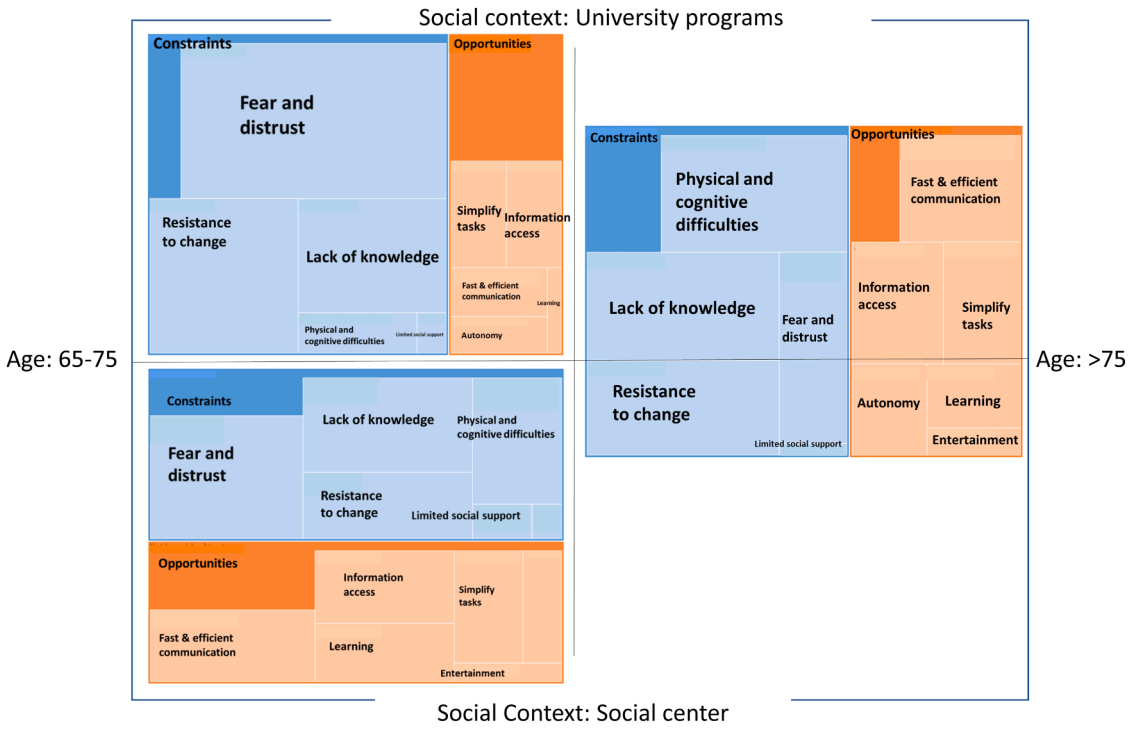


**Fig. 4.** Hierarchical maps based on the cluster; RQ2 in Clusters 1, 2, and 3.

participants belong.

### 3.2.1. *Cluster 1*

#### (a) The search for efficient communication, access to information and task simplification

The most frequently mentioned contributions of Internet use were fast and efficient communication ($f = 15$), access to information ($f = 13$), and ease of performing tasks ($f = 11$). Correlation analysis suggests a multiple relationship between fast and efficient communication, access to information, task automation, and autonomy (Table A2).

Digital communication (messaging, video calls) is often integrated into the daily routines of participants in this cluster. Comments were found showing how their communication has improved through digital applications, enabling closer relationships with family members, greater autonomy, and continuous interaction. For example, one participant commented:

"For me, one of the most important things is the mobile phone, which you carry everywhere. If your wife gets sick, or my daughter falls, it notifies me immediately. And before, that wasn't possible." CVR75RIO5.

Another frequently mentioned contribution of technology to people's lives was the ease of accessing information, highlighting the advantages of the Internet as an information source and its positive impact on knowledge.

"I think (the Internet) is a very good thing because it clears up so many doubts. Whatever you want (to know), you search for it, and sometimes a simple word can have many definitions, and it helps you understand (the meaning of) that word (…) and (quickly)… there you have it." CVU75JRJ4.

Numerous comments also showed how digital tools facilitate daily tasks or routines, such as shopping, travel, and financial management, improving autonomy.

"I think it is a very broad universe, with cards, payments at transfer level, there is also a virtual card where you charge what you think is convenient to make the purchase and not use the other one, everything is kept there…" CVU75JRJ4.

Some participants commented on the use of smart devices and applications, demonstrating how technology can serve as a facilitator in daily life:

"Alexa… I'm not sure if that's its name… (comments)… And what about the one in the car that knows how to get everywhere? You tell it you want to go to Sanlúcar, and it takes you there. 'Turn right, turn left, take the roundabout'… Then it can be a bit of a snitch, because it says, 'You are on such and such a street…' Who told you that? I haven't even said anything!" EVR75PUE1.

These types of comments serve as evidence that tools like Alexa and applications like Google Maps simplify their tasks and provide autonomy to perform activities (e.g., traveling independently) that would have been unimaginable in previous times.

#### (b) Continued family and institutional support tailored to their deficits

In this cluster, numerous references were made to obstacles and limitations in accessing technology. The most frequently mentioned limitations were lack of knowledge ($f = 24$), physical or cognitive difficulties ($f = 25$), resistance to change ($f = 21$), and fear and distrust ($f = 15$). Correlation analysis showed a relationship between lack of knowledge, resistance to change, and an attitude of fear and distrust, suggesting that digital literacy could help resolve issues of distrust and resistance (Table A2).

In this regard, institutional support can positively influence older adults' willingness to engage in digital learning processes, especially regarding tools and platforms that contribute to improving their quality of life.

"There is the 'seniors with WiFi' (program), which is run by the University of Huelva in collaboration with the Junta de Andalucía. And now in March, through the Asociación de la Línea 14, (…) I will be taking a course on the WhatsApp application, aimed at people who have more difficulty. We would also like to learn about the 'Salud Responde' app because we believe these two are essential for daily life." EMR75LEP4.

Depending on the type of limitations, participants indicated different

strategies to compensate for their difficulties in accessing technology. For example, participants who lack digital skills often show fear and distrust and rely on their close family members:

"The truth is, when there's something I don't know (I ask) my children, and I do it with them. 'I don't want to press anything until you are here,' and (when I receive an unknown message) I say, 'I won't open this because I don't know what it is.' So I won't touch it at all, I prefer not to do anything, and they tell me, 'Look, mom, it's this way.' But I don't press anything; I'm afraid when I'm not sure about something." EMR75LEP6.

Other comments suggested that resistance to adopting technologies is linked to a lack of digital skills, which can be compensated for by the training support offered by institutions. Comments reflected that those who do not use technology rely more on institutional support structures such as social centers and senior university programs. For example:

"I used to (use technology). Before, when I was in class, they made me do things, search and complete assignments, and learn how to use the Internet. But now that has ended…" CVR75RIO5.

However, testimonies were also found highlighting the inefficacy of such programs and the need for permanent digital literacy programs adapted to users' cognitive difficulties, including support strategies to gradually reduce fear and increase autonomy:

"They (have to explain it to me), but since my memory is so bad… I forget. Of course, they explain it to me… but when am I going to do it (on my own)? I don't know why, but I just can't. As I said, I was very interested in the classes we took (at this center), we learned a little, but I couldn't finish because I had to leave." CMU75HUE2.

### 3.2.2. *Cluster 2*

#### (a) Efficient communication and access to information as a source of knowledge

This was the cluster that made the most comments regarding the contributions of the Internet to their lives. The most frequently mentioned benefits of the Internet were fast and efficient communication ($f = 35$), information searching ($f = 30$), learning opportunities ($f = 24$), and ease of performing tasks ($f = 23$). Additionally, task automation was found to be related to autonomy, and access to information to learning (Table A2).

Some comments illustrated how task automation can be associated with information searching and can also serve as a source of entertainment and emotional well-being:

"I have Alexa (too), and she's like a friend to me. I wake up and say good morning, and Alexa responds, telling me what is being celebrated today… or what day it is, what the weather will be like, and all the information about the day. Then I say, 'Thank you, Alexa,' and she replies, 'Thank you to you.'" CVU65JRJ2.

Similarly, the use of the Internet as a source of information is often associated with informal learning of meaningful content for participants in this cluster. Below are some examples:

(Participant affected by a stroke) "The stroke, right? I have already looked up information about strokes, where they come from… where they don't come from, the aftereffects… and many other things like that. I mainly use Google (as an information source)." CVU65HUE4.

#### (b) Digital deficiencies and the need for an adapted proposal

The most frequently mentioned limitations in accessing technology were lack of knowledge ($f = 47$) and fear and distrust ($f = 55$). As seen in Cluster 1, both aspects often appeared closely related (Table A2).

Participants' comments showed that one of the main obstacles, the lack of knowledge, could be addressed by strengthening the availability of training workshops through social institutions, which would be especially relevant for people with physical or cognitive difficulties. For example:

"It's very hard for me. I lack reflexes, memory problems…" Or another participant who advocated for more options: "For the elderly people, I think (there should be courses), there should be a little more variety. Not in my case, since after my stroke, it's just hard for me." CVU65HUE4.

However, it seems that participants in this cluster do not find the necessary formal support to meet their needs. For example:

"Nowadays, in order to carry out any procedure, you need to have basic computer skills." CVR65TRI5.

"I'm interested (in learning), but there are no options, there's no room, they haven't called me [referring to the courses]." CVU65HUE5.

### 3.2.3. *Cluster 3*

#### (a) Search for efficiency and autonomy

In this cluster, there were few comments regarding the contributions of the Internet to their lives and well-being. Additionally, no codes related to entertainment were found. There was a correlation between the codes related to the advantages of learning, access to information, fast and effective communication, and the quick completion of tasks (Table A2).

Participants' comments showed a multivariate relationship between the various advantages that technology provides. That is, older adults who see the Internet as an educational resource also perceive it as a means of accessing information, facilitating quick and efficient communication, managing finances, and enhancing their autonomy. The following comments can serve as examples:

"I need to be more autonomous, right? Because today, (everything) is done by email. For example, yesterday I went to the dentist, and they said, 'I will send you the prescription by email, give me your email.' So I gave him my email, because I already have one." EMR65VIL3.

However, some comments served to set limits, particularly regarding the use of technology as an efficient means of communication, noting the impossibility of replacing some aspects of human communication:

"However, for example, when it comes to education, I've never liked the immediacy of the phone, and I don't think new technologies can replace personal relationships." EVR65VIL6.

#### (b) Distrust and search for support

The main digital deficiencies included lack of knowledge (14 references), fear and distrust (34 references), and resistance to change (19 references). Although the analysis did not show correlations between these codes (Annex A2), some comments showed that the lack of skills is an underlying factor in some of the obstacles to using technology autonomously. For example:

"But sometimes it's a hassle because (it requires skills)… now you have to attach, … upload the photo, … etc. For example, (for) authorizations, you have to scan the photo, transfer it to the phone… and then… I have to dedicate a lot of time to it, because I'm not fluent enough, it's a nuisance." EMR65VIL8.

Some comments showed relationships between the lack of skills and distrust with the search for support through family, indicating that in this cluster, participants tend to seek family support when they need to learn or use some kind of digital resource. For example:

"My daughter teaches me, my daughter tells me, 'Mom, do you know where you have to go? Look here, here, here… I (memorize it) and say, well, here is where my daughter told me, so I will go there and not move. Before doing anything, I always ask her, because she's younger, she's 33 years old." EMR65PUE2.

However, in other cases, participants turn to the courses or workshops offered by institutions and social services, which is a recurrent way for them to learn and use applications. For example:

"Sometimes I struggle to work with files, upload them, download them, and paste them into Word. I can do it, but it's very difficult for me,

and I get frustrated… I know I need to improve at this, but sometimes I waste time trying. Anyway, here I am (in a digital literacy workshop), doing what I can in this classroom… We're very happy, and we're doing what we can…" EVR65VIL5.

## 4. Discussion

In a group as heterogeneous as older adults, digital literacy for active aging should be addressed starting from their vital needs, according to their social context and specific circumstances (strengths and weaknesses). The SOC model and TSS approach are useful frameworks to anchor the issue and contextualize digital literacy for older adults. On the one hand, the TSS focuses on vital needs from a life cycle perspective, emphasizing that as we age, socioemotionally meaningful experiences become more relevant. Therefore, digital literacy programs should consider the participants' age and design socioemotionally relevant experiences for older learners. On the other hand, the SOC model approaches aging as a process of adaptation to the social environment, where the individual selects resources (e.g., knowledge, experience, technology, etc.) that help optimize their life and compensate for deficits due to aging. Therefore, for digital literacy for older adults to be meaningful, the way they use technology to optimize their life and the deficiencies they need to compensate for through support mechanisms must be considered.

Considering both approaches, the study presents an analytical framework that takes into account age and social context. Through focus groups, it explored (a) the purposes for which technology is used, (b) its contributions to their well-being, (c) the extent to which they optimize their lives, and (d) the resources to compensate for their weaknesses or deficiencies. After conducting a cluster analysis based on self-perceived skills, Internet usage frequency, social support, health status, and self-perceived quality of life, three profiles were identified that helped define a contextual reference framework for designing digital literacy programs. The main findings are described below.

### (a) Purposes and motivations for using technology in daily life

Technology plays a key role in the lives of older adults, although its integration varies across different clusters.

In Cluster 1 (over 75 years old with low technological integration), technology is mainly used for communication with others, information searching, and daily tasks (e.g., online banking, shopping). However, this group shows strong dependence on external support to carry out digital activities. In contrast, in Cluster 2 (adults under 75 with social and technological barriers), there is greater practical use of technology, combining administrative tasks, access to health services, and communication with family members. Finally, Cluster 3 (digitally well-integrated adults) incorporates technology into multiple aspects of their daily life, including task automation, access to varied information, and personalized entertainment.

From a socioemotionally selective perspective (Carstensen, 1998), Cluster 1, composed of the oldest individuals, showed a higher prevalence of comments related to communication with people. Their lesser interest in using technologies could be due to a lack of a clear emotional purpose in their interaction with them. In contrast, Cluster 3 integrates technology because it allows them to maintain an active life, using technology to streamline their daily tasks. Cluster 2 takes an intermediate position, where technology use is both functional and social. In line with Carstensen's postulates (1995, 1998), these findings show that socioemotional interest in technology is more pronounced in the oldest group and decreases in younger groups that perceive greater social support.

These findings converge with other studies showing that digital inclusion can improve the quality of life for older adults (Charness and Boot, 2009; Czaja et al., 2019). The ability to use technological tools not only broadens communication and access to information opportunities but also fosters autonomy and participation in social and recreational activities. However, the digital divide persists, especially in those over 75 years old (Cluster 1), who face cognitive and emotional barriers (Neves and Amaro, 2012).

### (b) Relationship between technology use and well-being perception

The data showed that technology use is associated with the perceived well-being of older adults, although it varies by cluster. Cluster 1 associates well-being with the socialization that technology allows. Participants' comments showed that contact with family and friends through social networks generates satisfaction and helps mitigate loneliness. In contrast, Cluster 2 uses technology as a tool to improve their quality of life, managing health services, accessing useful information, and participating in entertainment activities. Cluster 3 finds technology as a means to organize their time, access ongoing education, and enjoy leisure activities. Participants' comments suggest that digital integration contributes to a higher perceived well-being. From a sociocultural perspective, Deci and Ryan's (2000) self-determination theory could explain why older adults in Cluster 3, with higher technological competence, report greater satisfaction and well-being. Autonomy in technology use is associated with higher levels of intrinsic motivation and psychological well-being (Ryan and Deci, 2017).

### (c) Contributions of technology (optimization) to their lives

The benefits that technology use brings to their lives vary according to each cluster's level of digital integration. In **Cluster 1**, composed of the oldest participants with the least technology use, communication with family and access to information are highlighted as the main contributions, although their use remains limited to basic functions. They also value technology as a tool for performing everyday tasks, albeit with some dependence on others. In **Cluster 2**, in addition to these benefits, participants mention technology as a means of learning and entertainment, suggesting greater adaptation and exploration of its possibilities. In **Cluster 3**, where technology is more integrated into daily routines, it is seen as a key tool for efficiency and autonomy, facilitating financial and administrative management. These findings align with previous studies that highlight how older adults with more digital experience prioritize the instrumental use of technology (i.e., autonomy and time optimization in technology use) (Charness and Boot, 2009; Hargittai et al., 2018), while those with less experience mainly value communication and access to information (Seifert et al., 2018; Xu, Hu, and Huang, 2016).

### (d) Strategies to compensate for digital deficiencies

Digital deficiencies and the search for support to overcome them also show significant differences across the groups. In **Cluster 1**, the main obstacles are lack of knowledge, resistance to change, and fear of technology, leading to a strong dependence on family support and training programs, though with difficulties in retaining knowledge. In **Cluster 2**, fear and lack of training remain important barriers, but there is a greater willingness to participate in courses, although these are not always tailored to their needs. In **Cluster 3**, difficulties are more centered on specific technical aspects, such as digital certificates, leading to self-learning or occasional family support. Previous studies have identified similar patterns, noting that lack of confidence in technology use is a key barrier for older adults, and that access to personalized training can significantly improve their digital skills (Gallistl et al., 2020; Van Deursen and Helsper, 2015).

Overall, the findings of this study are closely linked to the Spanish context, where several sociocultural factors shape older adults' relationship with technology. Spain's welfare model, the strong role of family networks in providing support, and the marked rural–urban

digital divide all influence how older adults access and use digital tools. In addition, Spain has a well-established system of community social centres and university programmes for older adults, which creates learning opportunities that may not exist in the same form elsewhere.

These contextual features mean that some patterns observed in the study—such as the relevance of family support, the role of community centres, or the impact of geographical disparities—may differ in other countries or regions. However, the underlying mechanisms described by SST and the SOC model, as well as the socioemotional motivations and adaptive strategies identified, are consistent with international evidence. Therefore, while the results should be interpreted within the Spanish sociocultural framework, the broader insights are transferable and may inform research and digital literacy initiatives in other settings, particularly those with comparable family and community structures.

## 5. Conclusions

This study offers a contextualised understanding of how older adults engage with digital technologies, showing how age, social context, digital integration and personal circumstances shape everyday digital practices. The three clusters identified illustrate the diversity of experiences within later life and provide a basis for designing training initiatives that are sensitive to these differences.

Previous research has proposed typologies of older internet users (e.g., Friemel, 2014; Hargittai and Dobransky, 2017; van Deursen and Helsper, 2015), often focusing on skill levels, frequency of use or types of online activity. The typology developed in this study extends this work by incorporating socioemotional motivations and adaptive strategies derived from SST and the SOC model, as well as contextual dimensions such as participation in community or university programmes and rural–urban disparities. By integrating these elements, the typology provides a more holistic account of the factors that shape digital engagement in later life, highlighting the interplay between individual capacities, social environments and emotional goals.

These insights underscore the importance of digital literacy initiatives that recognise the heterogeneity of older adults and the situated nature of their digital practices. Approaches that align with their motivations, capabilities and social contexts are more likely to support meaningful and sustainable forms of digital inclusion.

## 6. Limitations

This study has several limitations that should be acknowledged. First, the findings are based on focus groups, which provide rich insights but do not offer statistical representativeness of the older population. Second, the research was conducted within a specific sociocultural context—Spain—meaning that local factors may shape participants' experiences and limit the generalisability of the results to other countries. In addition, the use of a guiding theoretical framework helps structure the analysis but may also introduce interpretative bias. Finally, given the rapid pace of technological change, older adults' digital needs and perceptions may evolve over time, which could affect the long-term relevance of the study's conclusions.

## Ethics statements

### Submission Statement

The authors declare the following:

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The article is not under consideration for publication elsewhere.

The publication of the article has been approved by all authors as well as by the responsible authorities at the institution where the work was carried out.

## Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used Microsoft Copilot in order to proof edit the manuscript. After using this tool/service, the authors reviewed and edited the content as needed and takes full responsibility for the content of the published article.

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## CRediT authorship contribution statement

**Ramón Tirado-Morueta:** Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Liliana Rodriguez-Alarcón:** Writing – review & editing, Validation, Investigation, Formal analysis, Data curation. **Paloma Contreras-Pulido:** Writing – review & editing, Validation, Investigation, Formal analysis. **Rocío Illanes-Segura:** Writing – review & editing, Validation, Investigation, Formal analysis.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix

**Table A1**
Pearson Correlations in RQ1.

| Code A | Code B | Cluster 1 | Cluster 2 | Cluster 3 |
|---|---|---|---|---|
| Daily Activities \ Sports | Technology Uses \ Information Search | 1 | 0.54 | |
| Daily Activities \ Basic Needs | Technology Uses \ Information Search | 0.31 | 0.25 | |
| Daily Activities \ Basic Needs | Technology Uses \ Entertainment | 0.25 | | |
| Daily Activities \ Leisure | Technology Uses \ Information Search | 1 | 0.54 | |
| Daily Activities \ Leisure | Technology Uses \ Administrative Tasks | 0.63 | 0.37 | |
| Daily Activities \ Leisure | Technology Uses \ Entertainment | 0.31 | | |
| Daily Activities \ Leisure | Technology Uses \ Training | 0.31 | | |
| Daily Activities \ Leisure | Technology Uses \ Does Not Use Technology | 0.31 | | |
| Daily Activities \ Social Participation | Technology Uses \ Information Search | 1 | 0.54 | |
| Daily Activities \ Social Participation | Technology Uses \ Administrative Tasks | 0.63 | 0.37 | |
| Daily Activities \ Social Participation | Technology Uses \ Entertainment | 0.31 | | |
| Daily Activities \ Social Participation | Technology Uses \ Training | 0.31 | | |
| Daily Activities \ Social Participation | Technology Uses \ Does Not Use Technology | 0.31 | | |
| Technology Uses \ Information Search | Daily Activities \ Household Activities | 1 | 0.64 | |
| Technology Uses \ Information Search | Well-being \ Adequate Mental Well-being | 0.63 | 0.54 | |
| Technology Uses \ Information Search | Well-being \ Inadequate Mental Well-being | 0.63 | 0.35 | |
| Technology Uses \ Information Search | Well-being \ Adequate Physical Well-being | 0.31 | 0.25 | |
| Technology Uses \ Entertainment | Daily Activities \ Household Activities | 0.31 | | |
| Technology Uses \ Entertainment | Technology Uses \ Information Search | 0.31 | 0.35 | |
| Technology Uses \ Entertainment | Daily Activities \ Sports | 0.31 | | |
| Technology Uses \ Training | Well-being \ Adequate Mental Well-being | 0.5 | 0.34 | |
| Technology Uses \ Training | Daily Activities \ Household Activities | 0.31 | | |
| Technology Uses \ Training | Technology Uses \ Information Search | 0.31 | 0.35 | |
| Technology Uses \ Training | Daily Activities \ Sports | 0.316228 | | |
| Technology Uses \ Training | echnology Uses \ Entertainment | 0.25 | 0.41 | |
| Technology Uses \ Administrative Tasks | Well-being \ Adequate Mental Well-being | 1 | 0.68 | |
| Technology Uses \ Administrative Tasks | Daily Activities \ Household Activities | 0.63 | 0.51 | |
| Technology Uses \ Administrative Tasks | Technology Uses \ Information Search | 0.63 | 0.54 | |
| Technology Uses \ Administrative Tasks | Daily Activities \ Sports | 0.63 | 0.37 | |
| Technology Uses \ Administrative Tasks | Well-being \ Adequate Physical Well-being | 0.5 | | |
| Technology Uses \ Administrative Tasks | Technology Uses \ Training | 0.5 | 0.34 | |
| Technology Uses \ Administrative Tasks | Well-being \ Inadequate Mental Well-being | 0.25 | | |
| Technology Uses \ Task Automation | Well-being \ Inadequate Physical Well-being | 0.58 | | |
| Technology Uses \ Task Automation | Well-being \ Inadequate Mental Well-being | 0.33 | | |
| Technology Uses \ Does Not Use Technology | Well-being \ Inadequate Mental Well-being | 0.5 | 0.41 | 0.58 |
| Technology Uses \ Does Not Use Technology | Daily Activities \ Household Activities | 0.31 | 0.4 | 0.58 |
| Technology Uses \ Does Not Use Technology | Technology Uses \ Information Search | 0.31 | 0.25 | |
| Technology Uses \ Does Not Use Technology | Daily Activities \ Sports | 0.31 | 0.58 | |
| Technology Uses \ Does Not Use Technology | Well-being \ Adequate Physical Well-being | 0.25 | 0.3 | |
| Technology Uses \ Does Not Use Technology | Codes \ Technology Uses \ Entertainment | 0.25 | | |
| Technology Uses \ Does Not Use Technology | Codes \ Daily Activities \ Basic Needs | 0.25 | 0.3 | |
| Technology Uses \ Task Automation | Well-being \ Adequate Mental Well-being | 0.58 | | |

**Table A2**
Pearson Correlations in RQ2.

| Code A | Code B | Cluster 1 | Cluster 2 | Cluster 3 |
|---|---|---|---|---|
| Benefits associated with the Internet\Ease of completing tasks and activities | Benefits associated with the Internet\Autonomy | 1 | 0.86 | 0.58 |
| Benefits associated with the Internet\Ease of completing tasks and activities | Benefits associated with the Internet\Fast and effective communication | 0.63 | 0.56 | 1 |
| Benefits associated with the Internet\Ease of completing tasks and activities | Benefits associated with the Internet\Entertainment | 0.5 | 0.47 | - |
| Benefits associated with the Internet\Ease of completing tasks and activities | Benefits associated with the Internet\Access to information | 0.25 | 0.69 | - |
| Benefits associated with the Internet\Ease of completing tasks and activities | Benefits associated with the Internet\Learning | - | 0.45 | - |
| Benefits associated with the Internet\Entertainment | Benefits associated with the Internet\Learning | 0.71 | 0.63 | - |
| Benefits associated with the Internet\Entertainment | Benefits associated with the Internet\Access to information | 0.5 | 0.47 | - |
| Benefits associated with the Internet\Entertainment | Benefits associated with the Internet\Autonomy | 0.5 | 0.55 | - |
| Benefits associated with the Internet\Entertainment | Benefits associated with the Internet\Fast and effective communication | 0.32 | - | - |
| Benefits associated with the Internet\Fast and effective communication | Benefits associated with the Internet\Access to information | 0.63 | 0.56 | - |
| Lack of digital skills\Resistance to change | Lack of digital skills\Lack of knowledge | 1 | - | - |
| Lack of digital skills\Resistance to change | Lack of digital skills\Fear and distrust | 0.63 | - | - |
| Lack of digital skills\Resistance to change | Perceived social support\Family support | 0.45 | - | - |
| Lack of digital skills\Resistance to change | Perceived social support\Social support | 0.45 | - | - |

(*continued on next page*)

**Table A2** (*continued*)

| Code A | Code B | Cluster 1 | Cluster 2 | Cluster 3 |
|---|---|---|---|---|
| Lack of digital skills\Resistance to change | Perceived social support\Institutional support | 0.32 | - | - |
| Lack of digital skills\Fear and distrust | Lack of digital skills\Lack of knowledge | 0.63 | 0.42 | - |
| Lack of digital skills\Fear and distrust | Lack of digital skills\Limited social support | 0.32 | - | - |
| Lack of digital skills\Fear and distrust | Benefits associated with the Internet\Ease of completing tasks and activities | 0.25 | - | - |
| Lack of digital skills\Limited social support | Perceived social support\Institutional support | 0.63 | 0.44 | 1 |
| Lack of digital skills\Limited social support | Perceived social support\Social support | 0.45 | - | - |
| Lack of digital skills\Lack of knowledge | Perceived social support\Family support | 0.45 | 0.47 | - |
| Lack of digital skills\Lack of knowledge | Perceived social support\Social support | 0.45 | 0.26 | - |
| Lack of digital skills\Lack of knowledge | Perceived social support\Institutional support | 0.32 | 0.26 | - |
| Perceived social support\Social support | Perceived social support\Institutional support | 0.71 | 0.65 | - |
| Perceived social support\Social support | Perceived social support\Family support | 0.33 | - | - |
| Benefits associated with the Internet\Fast and effective communication | Benefits associated with the Internet\Learning | - | 0.58 | 0.33 |
| Benefits associated with the Internet\Fast and effective communication | Benefits associated with the Internet\Autonomy | - | 0.42 | 0.58 |
| Benefits associated with the Internet\Autonomy | Benefits associated with the Internet\Access to information | - | 0.56 | 1 |
| Benefits associated with the Internet\Autonomy | Benefits associated with the Internet\Learning | - | 0.29 | 0.58 |
| Benefits associated with the Internet\Learning | Benefits associated with the Internet\Access to information | - | 0.75 | 1 |
| Lack of digital skills\Lack of resources | Lack of digital skills\Lack of social support | - | 0.53 | - |
| Lack of digital skills\Lack of resources | Perceived social support\Institutional support | - | 0.44 | - |
| Lack of digital skills\Physical or cognitive difficulties | Perceived social support\Institutional support | - | 0.47 | |
| Lack of digital skills\Physical or cognitive difficulties | Perceived social support\Social support | - | 0.47 | - |

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